AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

THE AMERICAN ENERGY INITIATIVE, PART 28: A FOCUS ON THE OUTLOOK FOR ACHIEVING NORTH AMERICAN ENERGY INDEPENDENCE WITHIN THE DECADE

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND POWER

OF THE

COMMITTEE ON ENERGY AND COMMERCE

HOUSE OF REPRESENTATIVES

ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

SEPTEMBER 13, 2012

Serial No. 112–176

Printed for the use of the Committee on Energy and Commerce

energycommerce.house.gov

U.S. GOVERNMENT PRINTING OFFICE

85–353 PDF WASHINGTON : 2013

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

COMMITTEE ON ENERGY AND COMMERCE

FRED UPTON, Michigan
Chairman

JOE BARTON, Texas
Chairman Emeritus
CLIFF STEARNS, Florida
ED WHITFIELD, Kentucky
JOHN SHIMKUS, Illinois
JOSEPH R. PITTS, Pennsylvania
MARY BONO MACK, California
GREG WALDEN, Oregon
LEE TERRY, Nebraska
MIKE ROGERS, Michigan
SUE WILKINS MYRICK, North Carolina
Vice Chairman
JOHN SULLIVAN, Oklahoma
TIM MURPHY, Pennsylvania
MICHAEL C. BURGESS, Texas
MARSHA BLACKBURN, Tennessee
BRIAN P. BILBRAY, California
CHARLES F. BASS, New Hampshire
PHIL GINGREY, Georgia
STEVE SCALISE, Louisiana
ROBERT E. LATTA, Ohio
CATHY McMORRIS RODGERS, Washington
GREGG HARPER, Mississippi
LEONARD LANCE, New Jersey
BILL CASSIDY, Louisiana
BRETT GUTHRIE, Kentucky
PETE OLSON, Texas
DAVID B. McKINLEY, West Virginia
CORY GARDNER, Colorado
MIKE POMPEO, Kansas
ADAM KINZINGER, Illinois
H. MORGAN GRIFFITH, Virginia

HENRY A. WAXMAN, California
Ranking Member
JOHN D. DINGELL, Michigan
Chairman Emeritus
EDWARD J. MARKEY, Massachusetts
EDOLPHUS TOWNS, New York
FRANK PALLONE, JR., New Jersey
BOBBY L. RUSH, Illinois
ANNA G. ESHOO, California
ELIOT L. ENGEL, New York
GENE GREEN, Texas
DIANA DEGETTE, Colorado
LOIS CAPPS, California
MICHAEL F. DOYLE, Pennsylvania
JANICE D. SCHAKOWSKY, Illinois
CHARLES A. GONZALEZ, Texas
TAMMY BALDWIN, Wisconsin
MIKE ROSS, Arkansas
JIM MATHESON, Utah
G.K. BUTTERFIELD, North Carolina
JOHN BARROW, Georgia
DORIS O. MATSUI, California
DONNA M. CHRISTENSEN, Virgin Islands
KATHY CASTOR, Florida
JOHN P. SARBANES, Maryland

SUBCOMMITTEE ON ENERGY AND POWER

ED WHITFIELD, Kentucky
Chairman

JOHN SULLIVAN, Oklahoma
Vice Chairman
JOHN SHIMKUS, Illinois
GREG WALDEN, Oregon
LEE TERRY, Nebraska
MICHAEL C. BURGESS, Texas
BRIAN P. BILBRAY, California
STEVE SCALISE, Louisiana
CATHY McMORRIS RODGERS, Washington
PETE OLSON, Texas
DAVID B. McKINLEY, West Virginia
CORY GARDNER, Colorado
MIKE POMPEO, Kansas
H. MORGAN GRIFFITH, Virginia
JOE BARTON, Texas
FRED UPTON, Michigan *(ex officio)*

BOBBY L. RUSH, Illinois
Ranking Member
KATHY CASTOR, Florida
JOHN P. SARBANES, Maryland
JOHN D. DINGELL, Michigan
EDWARD J. MARKEY, Massachusetts
ELIOT L. ENGEL, New York
GENE GREEN, Texas
LOIS CAPPS, California
MICHAEL F. DOYLE, Pennsylvania
CHARLES A. GONZALEZ, Texas
HENRY A. WAXMAN, California *(ex officio)*

C O N T E N T S

	Page
Hon. Ed Whitfield, a Representative in Congress from the Commonwealth of Kentucky, opening statement	1
Prepared statement	4
Hon. Bobby L. Rush, a Representative in Congress from the State of Illinois, opening statement	6
Hon. Fred Upton, a Representative in Congress from the State of Michigan, opening statement	7
Prepared statement	9
Hon. Joe Barton, a Representative in Congress from the State of Texas, opening statement	10
Hon. Henry A. Waxman, a Representative in Congress from the State of California, opening statement	10
Hon. Gene Green, a Representative in Congress from the State of Texas, opening statement	11

WITNESSES

Harold Hamm, Chairman and Chief Executive Officer, Continental Resources	12
Prepared statement	15
Daniel P. Ahn, Chief Commodities Economist, Citigroup	29
Prepared statement	30
John Freeman, Managing Director, Equity Research, Raymond James & Associates	41
Prepared statement	43
Daniel J. Weiss, Senior Fellow, Center for American Progress Action Fund	88
Prepared statement	90
John Purcell, Vice President of Wind Energy, Leeco Steel	118
Prepared statement	120
Mark P. Mills, Senior Fellow, Manhattan Institute	124
Prepared statement	126
Peter Howard, President and Chief Executive Officer, Canadian Energy Research Institute	128
Prepared statement	130

THE AMERICAN ENERGY INITIATIVE, PART 28: A FOCUS ON THE OUTLOOK FOR ACHIEVING NORTH AMERICAN ENERGY INDEPENDENCE WITHIN THE DECADE

THURSDAY, SEPTEMBER 13, 2012

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND POWER,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:05 a.m., in room 2322 of the Rayburn House Office Building, Hon. Ed Whitfield (chairman of the subcommittee) presiding.

Members present: Representatives Whitfield, Sullivan, Burgess, Scalise, McMorris Rodgers, Olson, McKinley, Pompeo, Griffith, Barton, Upton (ex officio), Rush, Castor, Sarbanes, Markey, Green, Capps, and Waxman (ex officio).

Staff present: Charlotte Baker, Press Secretary; Sean Bonyun, Communications Director; Anita Bradley, Senior Policy Advisor to Chairman Emeritus; Maryam Brown, Chief Counsel, Energy and Power; Allison Busbee, Legislative Clerk; Cory Hicks, Policy Coordinator, Energy and Power; Heidi King, Chief Economist; Jason Knox, Counsel, Energy and Power; Ben Lieberman, Counsel, Energy and Power; Andrew Powaleny, Deputy Press Secretary; Michael Aylward, Democratic Professional Staff Member; Greg Dotson, Democratic Energy and Environment Staff Director; Kristina Friedman, EPA Detailee; Caitlin Haberman, Democratic Policy Analyst; and Alexandra Teitz, Democrat Senior Counsel, Energy and Environment.

OPENING STATEMENT OF HON. ED WHITFIELD, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF KENTUCKY

Mr. WHITFIELD. I would like to call the hearing to order this morning. The topic of our hearing, and today we continue our hearings on the American Energy Initiative. This is actually the 28th day, and today we are going to talk about what I consider some very good news, and that is the achievability of North American energy independence and particularly oil independence within the span of a mere decade.

As a matter of fact, one of our witnesses today made the comment in a study, a comprehensive study, that by the end of the decade, they estimate that new U.S. oil and gas production could add at least $200 to $300 billion in revenue, which in turn could stimu-

late many hundreds of billions more in economic activity, investment and consumption, creating at least 2 million and as high as 3–1/2 million new jobs.

So after many decades of hearing that the United States basically reached the end of its reserve, as a matter of fact, as recently as 2010 President Obama stated in a national address that we are running out of places to drill, and he still cites the outdated and misleading claim that we possess only 2 percent of the world's oil reserves. But this pessimistic view is being blown away by reality. Increased domestic oil production is already cutting into the amount we need to import from oil-exporting nations, and many experts believe that this production growth can continue for years to come. And when you add the equally impressive growth from our ally Canada, the goal of North American oil independence could be reached in as little as a decade.

The global implications are tremendous because the one thing that has not changed is the instability in the Middle East and the hostility of several major oil-producing nations towards the United States. However, the more oil that is produced in the United States and Canada, the less leverage OPEC or any of its individual member nations can exert over us. And now we have the chance to reduce that leverage virtually to zero with North American oil independence.

The geopolitical benefits alone are enough to make this goal worthwhile, and the economic benefits are simply icing on the cake. North American energy independence would bring with it hundreds of thousands, if not millions, of new jobs in a rejuvenated energy industry. Indeed, it would succeed where unfortunately our stimulus package failed, and rather than cost over $800 billion, it would actually add revenues to the Federal Treasury. And when you compare the real oil-industry jobs already being created in States like North Dakota, and as you know, in North Dakota right now, the unemployment rate is less than 3 percent, and all the experts agree that that primarily comes from the fact of the new oil fields that have been hit there, the jobs that are being created. And not only can we talk about oil but we also could talk about independence in natural gas because of the tremendous finds that we are finding in that area.

President Obama has not really been helpful to us in this effort, in my view. As you know, he rejected the Keystone pipeline that would allow 700,000 barrels per day of additional Canadian oil to come into the country. And without that, Canada's growing surplus of oil may go to China and other willing buyers abroad.

One of the areas that we certainly want to get into today as well is because we hear constantly from some individuals that even though the United States may increase its oil production, it is not going to have any impact on the price of oil, and I would like to have an additional discussion about that today because there was a law of supply and demand that has been with us for many years that if you have more supply, you can decrease prices, or if you reduce demand, you can decrease prices. So we want to get into a discussion on that today as well.

We have a panel of expert witnesses today, all who have practical experience and academic experience and are quite knowledgeable in this area, so we look forward to all of your testimony.

So I am delighted that you are here today. We look forward to the testimony of all of you.

[The prepared statement of Mr. Whitfield follows:]

Opening Statement of the Honorable Ed Whitfield
Subcommittee on Energy and Power
Hearing on "The American Energy Initiative: A Focus on the Outlook for Achieving North American Energy Independence Within the Decade"
September 13, 2012
(As Prepared for Delivery)

There's an old saying that when good news comes knocking, you should open the door.

Today, we are going to talk about some very good news - the achievability of North American energy independence, and particularly oil independence, within the span of a mere decade. However, in order for this potential good news to become reality, the federal government has to take certain steps to allow it to happen.

I might add that it was not long ago that we were repeatedly told that we would have to live with declining U.S. and North American oil production. As recently as 2010, President Obama stated in a national address that we are running out of places to drill on land. And he still cites the outdated and misleading claim that we possess only two percent of the world's oil reserves.

But this pessimistic view is being blown away by reality. Increased domestic oil production is already cutting into the amount we need to import from unfriendly oil-exporting nations, and many experts believe that this production growth can continue for years to come. And when you add the equally impressive growth from our ally Canada, the goal of North American oil independence could be reached in as little as a decade.

The global implications are tremendous because the one thing that has not changed is the instability in the Middle East and the hostility of several major oil producing nations towards the U.S. However, the more oil that is produced in the U.S. and Canada, the less leverage OPEC or any of its individual member nations can exert over us. And now we have the chance to reduce that leverage virtually to zero with North American oil independence.

The geopolitical benefits alone are enough to make this goal worthwhile, and the economic benefits are just icing on the cake. North American energy independence would bring with it hundreds of thousands, if not millions, of new jobs in a rejuvenated energy industry. Indeed, it would succeed where the stimulus package failed, and rather than cost over $800 billion it would actually add revenues to the federal treasury. When you compare the real oil-industry jobs already being created in states like North Dakota with the wishful thinking from Daniel Weiss of the Center for American Progress, who is testifying today, that the stimulus was going to create 900,000 clean energy jobs, it is clear which energy policy is going to put Americans back to work. And if all that were not enough, the extra supplies of oil would help reduce the price at the pump for years to come.

So, there is no question that good news is knocking on the door. However, President Obama has thus far refused to open that door. He has rejected the Keystone XL pipeline that would allow 700,000 barrels per day of additional Canadian oil to come into the country. Without it, Canada's growing surplus of oil may go to China and other willing buyers abroad.

Even more troubling is the fact that the president has blocked access to many energy-rich federal lands and offshore areas. Indeed, the increase in American oil production is especially impressive given that we have done it with one hand tied behind our back. According to the Congressional Research Service, fully 96 percent of the increase since 2007 has occurred on non-federal lands, where the Obama administration doesn't have the power to block leasing or impose permitting delays. But on federally-controlled lands and offshore areas, production has actually declined by two percent.

However, private and state-owned lands can't do it all. The full potential of North American energy independence cannot be realized if too many federal lands are left out of the equation. And to make

matters worse, the administration may be going after oil production on state and private lands as well through a regulatory crackdown on hydraulic fracturing. These anti-oil policies need to change.

We used to think that we were running up against the limits of geology and that there was nothing we could do to increase North American energy supplies. But the fact is that billions and billions of barrels of oil are waiting to be produced. The only obstacle is the political will to make use of the resource wealth that lies beneath our feet.

###

Mr. WHITFIELD. At this time I would like to introduce and recognize the gentleman from Illinois, Mr. Rush, for his opening statement.

OPENING STATEMENT OF HON. BOBBY L. RUSH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. RUSH. I want to thank you, Mr. Chairman.

We are here today examining the issue of how we may reach North American energy independence within the next decade. This hearing, Mr. Chairman, gives us an opportunity to discuss the many different initiatives that President Obama has put in place to help us come closer to reaching this goal.

Mr. Chairman, unlike the simplistic Sarah Palin "Drill, baby, drill" Romney-Ryan energy plan, President Obama has put forward a comprehensive energy policy that encompasses concrete proposals to not only make us less reliant on imported oil from overseas but which also takes into account the serious issue of climate change. While my Republican colleagues are loathe to even mention the words "climate change" and have claimed it to be a hoax, I can assure you, Mr. Chairman, that most of the farmers across this Nation will disagree with that position as we have witnessed the worst year of record temperatures, drought and crop loss in modern American history.

Mr. Chairman, in 2011, the Obama administration introduced and released the Obama administration's energy plan titled "New Plan for Secure Energy Future." This comprehensive energy proposal would build "21st century clean-energy economy by reducing our dependence on oil focusing on expanding clean-energy sources of electricity and achieving additional energy efficiency through a combination of an all-of-the-above energy policy." I would add, the Obama strategy strongly promotes the creation of jobs by developing renewable-energy sources such as wind, solar, biomass and hydropower while also investing in clean-coal technology, increasing production of natural gas and expanding nuclear power. However, unlike the Romney plan, the Obama energy proposal endorses safe and responsible production of domestic energy sources which allows input from community members and stakeholders who are directly impacted by oil and gas drilling.

Any credible expert would have to give credit to the Obama administration for the advances that they have put in place to put us on track for achieving energy independence which includes increased domestic production, a move towards cleaner and renewable-energy sources of the future as well as additional conservation and energy efficiency measures.

U.S. oil consumption, which peaked in 2005, dropped by more than 1.5 million barrels per day, or about 9 percent, by 2011. While some of this recent decline in demand was related to the economic recession, improvements in fuel efficiency and broader economic trends put forth by the Obama administration are also responsible for these developments. One instance, the Obama administration's vehicle greenhouse gas and fuel economy standards for model years 2012 through 2025 are projected to save more than 2.2 million barrels of oil per day by the year 2025 and will help us become less reliant on both oil imports and oil in general.

Mr. Chairman, I look forward to this hearing and I expect to have robust interaction among the witnesses today and the members of both sides, and Mr. Chairman, I sincerely hope that we can have a balanced and honest debate on these and all the ancillary issues.

I thank you, and I yield back the balance of my time.

Mr. WHITFIELD. Thank you, Mr. Rush.

At this time I would like to recognize the gentleman from Michigan, Mr. Upton, chairman of the full committee, for an opening statement.

OPENING STATEMENT OF HON. FRED UPTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. UPTON. Well, thank you.

No administration has talked more about technological breakthroughs in the energy sector or spent more tax dollars on failed attempts to achieve them than the current one. Yet a genuinely transformative energy revolution has emerged, and it has happened in spite of those policies.

The advances in drilling technology that we will hear about today have accomplished more for the American people than all of the Solyndras and the other Federal stimulus giveaways combined. They have already rewritten the conventional wisdom that America's natural gas production is declining, and we are now doing the same for domestic oil production. In fact, predictions of dwindling North American oil supplies have been replaced with very realistic predictions of North American oil independence within a decade.

Indeed, while the President was trying to convince Americans that Solyndra's new solar panels would take the world by storm and create green jobs, these game-changing energy breakthroughs have quietly continued to unfold in places like the Bakken formation in North Dakota and other State and private lands where the Federal Government has little or no role. And unlike Solyndra and other Title 17 loan guarantees that have been a sponge for taxpayer dollars, achieving North American oil independence won't cost the American people a single dime. All it requires is the Federal Government to get out of the way.

But getting out of the way is something this administration refuses to do. It continues its go-slow approach to oil leasing on Federal lands and offshore. For example, its most recent 5-year plan for offshore leasing offers fewer lease sales than under any president, Democrat or Republican, going all the way back to Jimmy Carter. And, the administration's pace of onshore leasing is below that of his predecessors. Even those Federal areas already under lease are now being subjected to unprecedented permitting delays. In fact, nearly all the increase in domestic oil supplies is coming from State and private lands, but on Federal lands, production has actually dropped 100 billion barrels this last year. The dramatic improvements in drilling technology that are responsible for increased oil production on non-Federal lands have not yet been given the chance to do so on Federal lands.

The same is true of vital oil infrastructure. The administration continues to reject the Keystone XL pipeline expansion project, without which Canada's growing oil production cannot reach the

United States. The pipeline would also provide an outlet for the growing oil production from North Dakota.

The potential benefits of North American energy independence seem almost too good to be true. But they are real and they can be achieved. Between increased domestic oil production and growing supplies from Canada—a million barrels a day already, by the way—we have the opportunity to liberate ourselves from OPEC's influence, create many new energy-industry jobs, and ensure greater supplies and lower prices at the pump in the years ahead.

This committee has initiated legislation to remove the administration's obstacles to North American energy independence. We will continue to fight for increased leasing on Federal lands and a streamlined permitting process, and we will not give up on Keystone XL. The goal of North American energy independence is within our grasp and it is much too valuable an opportunity to squander.

And I would yield back to Mr. Barton.

[The prepared statement of Mr. Upton follows:]

Opening Statement of the Honorable Fred Upton
Subcommittee on Energy and Power
Hearing on "The American Energy Initiative: A Focus on the Outlook for Achieving North American Energy Independence Within the Decade"
September 13, 2012
(As Prepared for Delivery)

No administration has talked more about technological breakthroughs in the energy sector or spent more tax dollars on failed attempts to achieve them than the current one. Yet a genuinely transformative energy revolution has emerged – and it has happened in spite of these policies.

The advances in drilling technology that we will hear about today have accomplished more for the American people than all of the Solyndras and other federal stimulus giveaways combined. They have already rewritten the conventional wisdom that America's natural gas production is declining, and are now doing the same for domestic oil production. In fact, predictions of dwindling North American oil supplies have been replaced with very realistic predictions of North American oil independence within a decade.

Indeed, while the president was trying to convince Americans that Solyndra's new solar panels would take the world by storm and create green jobs, these game changing energy breakthroughs have quietly continued to unfold in places like the Bakken formation in North Dakota and other state and private lands where the federal government has little to no role.

And unlike Solyndra and other Title 17 loan guarantees that have been a sponge for taxpayer dollars, achieving North American oil independence won't cost the American people a dime. All it requires is the federal government to get out of the way.

But getting out of the way is something this administration refuses to do. It continues its go slow approach to oil leasing on federal lands and offshore areas. For example, its most recent 5-year plan for offshore leasing offers fewer lease sales than under any president, Democrat or Republican, going all the way back to Jimmy Carter. And, the administration's pace of onshore leasing is below that of his predecessors. And even those federal areas already under lease are now being subjected to unprecedented permitting delays.

In fact, nearly all the increase in domestic oil supplies is coming from state and private lands, but on federal lands, production has actually dropped. The dramatic improvements in drilling technology that are responsible for increased oil production on non-federal lands have not yet been given the chance to do so on federal lands.

The same is true of vital oil infrastructure. The administration continues to reject the Keystone XL pipeline expansion project, without which Canada's growing oil production cannot reach the U.S. The pipeline would also provide an outlet for the growing oil production from North Dakota.

The potential benefits of North American energy independence seem almost too good to be true. But they are real and can be achieved. Between increased domestic oil production and growing supplies from Canada, we have the opportunity to liberate ourselves from OPEC's influence, create many new energy industry jobs, and ensure greater supplies and lower prices at the pump in the years ahead.

This committee has initiated legislation to remove the administration's obstacles to North American energy independence. We will continue to fight for increased leasing on federal lands and a streamlined permitting process. And we will not give up on Keystone XL until it is approved. The goal of North American energy independence is within our grasp and is much too valuable an opportunity to squander.

###

OPENING STATEMENT OF HON. JOE BARTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. BARTON. I just want to say very quickly, Mr. Chairman, that back in 2005, this committee initiated what came to be known as the Energy Policy Act of 2005. Most members of the committee still serving supported that bill in the committee and on the floor, and today is the law of the land.

We incentivized in that Act every feasible form of energy we thought could be produced in American, whether it was conventional or unconventional. If you could produce it in any shape, form or fashion, we incentivized it from our conventional sources, oil and gas, to unconventional wind, solar, biomass, saw grass, you name it. The underlying premise was, though, except for the newer technologies, it would be a market-based energy policy. Because of that, today if you read this North American energy initiative inventory, we have a possibility to be energy independent almost at any time we want to be in the next 10 to 15 years. That is an amazing story, Mr. Chairman, and this committee can take pride in the fact that the base bill that has allowed that to happen came out of this committee.

So I am very proud of that bill. It is now the law. I am proud of the committee, and I am looking forward to this hearing.

With that, I yield back, Mr. Chairman.

Mr. WHITFIELD. Thank you. At this time I recognize the gentleman from California, Mr. Waxman, for 5 minutes.

OPENING STATEMENT OF HON. HENRY A. WAXMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. WAXMAN. Mr. Chairman, today's hearing presents two different visions of an energy policy for America. One vision doubles down on the energy policies of the past. Its mantras are "drill, baby, drill" and tax breaks for the oil industry. The other vision recognizes that energy is key to America's economy, national security and environment. It supports a mix of energy sources to provide American consumers with affordable, clean energy. The choice is all of the above or oil above all, and the answer will affect the lives of every American.

Not so long ago, we actually implemented an energy plan written by and for the oil industry. In 2001, President Bush and Vice President Cheney unveiled the Bush administration's energy plan, written in secret with oil, coal and other energy-industry interests. So in 2005, I examined what had happened to energy prices and dependence on foreign oil under the Bush energy policy since 2001, using data and analysis from the EIA. Under the Bush-Cheney oil industry energy plan, gasoline prices more than doubled. Crude oil prices more than doubled. The average American family spent $2,000 more each year on energy costs. And the oil companies reaped record profits. This energy plan did not benefit America's families. It did not boost our economy or improve our national security, and it certainly did not clean up pollution or address the threat of climate change.

Today we are discussing another Republican energy plan that was drafted with industry, especially the oil industry. And it is a

backwards-looking plan that resurrects the Bush-Cheney policies. It calls for more tax breaks for oil companies, opening new areas to drilling, and putting the States in charge of issuing drilling permits on Federal lands.

The Obama administration's energy policy is fundamentally different. President Obama hasn't just promised to reduce our dependence on foreign oil; he has actually done it. For the first time in decades, we are importing less than half the oil we consume. His administration's new motor vehicle standards will save more than 2 million barrels of oil per day. And U.S. domestic oil and natural gas production has reached record highs. Perhaps most important, the Obama administration has also made investing in clean energy technologies a national priority.

This committee can write our Nation's energy laws, but we can't amend the laws of nature. Climate change is a reality. The nations with the strongest economies will be those that recognize this fact and build the clean energy technologies of the future.

Unlike many members of this body, the Obama administration faces facts, listens to scientists, and has a forward-looking vision for America, and that is why the President has invested in wind, solar, and other renewable energy sources, energy efficiency, and cleaner use of traditional energy sources.

Mr. Chairman, at this point I want to yield the balance of my time to Mr. Green.

OPENING STATEMENT OF HON. GENE GREEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. GREEN. I thank my ranking member, Mr. Chairman, for allowing me.

I strongly support increasing our domestic production of oil and natural gas, and I fought this battle for years. That said, I think it is misleading to debate our energy independence based on geology, technological or economically achievable in the absence of other constraints. There is always to be external factors that affect the level of production.

I want to point out that according to the Energy Information Administration, under existing policies, the United States is on pace to eliminate all natural-gas imports by 2020 and shrink its net oil imports down to 38 percent. We are now at 42 percent, from what I understand, with two-thirds of those imports coming from friends in Canada in Mexico. The number is expected to drop even further thanks to the CAFE standards by the President's administration. We are still fairly close to the North American energy independence in 2020 regardless of what we do.

I share our panelists' concerns about the potential regulation on things like fracking, and I will continue to watch the administration. I support a broad Outer Continental Shelf drilling and I disagree with the President's 5-year plan. Likewise, I disagree with not approving the TransCanada pipeline but I also know this is the first President that I have served under in 20 years who actually stood at the State of the Union and last week at the Democratic convention and talk about the success of natural-gas production in our country, at least the first Democratic President, and I think that is where we are going, and I want to complement my former

chair of the committee. The energy bill of 2005 did expand it. My frustration, we are going to have a bill on the floor tomorrow that will take some of that expansion away from us including oil and gas alternatives and other alternatives.

So that is our problem we have with this Congress. We are passing a lot of messages but not actually legislation, and I yield back my time.

Mr. WHITFIELD. The gentleman's time is expired.

At this time I will call on each witness, and you will be given 5 minutes for an opening statement. Before I call on you individually, I am just going to introduce the entire panel.

First of all, we have with us today Mr. Harold Hamm, who is the Chairman and CEO of Continental Resources. It has played a vital role in the development of the Bakken field. We have Dr. Daniel Ahn, who is the Chief Commodity Economist at Citigroup. We have Mr. John Freeman, who is the Managing Director of E&P Equity Research at Raymond James and Associates. We have Mr. Daniel Weiss, who is the Senior Fellow for the Center for American Progress Action Fund. We have Mr. John Purcell, who is the Vice President for Wind Energy at Leeco Steel Company. We have Mr. Mark Mills, who is the Senior Fellow at the Manhattan Institute, and we have Mr. Peter Howard, who is the President and CEO of Canadian Energy Research Institute.

So we have a broad spectrum of interests here to testify this morning on this important subject matter, and Mr. Hamm, I will call on you first for a 5-minute opening statement.

STATEMENTS OF HAROLD HAMM, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, CONTINENTAL RESOURCES; DANIEL P. AHN, CHIEF COMMODITIES ECONOMIST, CITIGROUP; JOHN FREEMAN, MANAGING DIRECTOR, EQUITY RESEARCH, RAYMOND JAMES & ASSOCIATES; DANIEL J. WEISS, SENIOR FELLOW, CENTER FOR AMERICAN PROGRESS ACTION FUND; JOHN PURCELL, VICE PRESIDENT OF WIND ENERGY, LEECO STEEL; MARK P. MILLS, SENIOR FELLOW, MANHATTAN INSTITUTE; AND PETER HOWARD, PRESIDENT AND CHIEF EXECUTIVE OFFICER, CANADIAN ENERGY RESEARCH INSTITUTE

STATEMENT OF HAROLD HAMM

Mr. HAMM. Thank you, Chairman Whitfield and members of the committee. I am very glad to be here, very honored to be speaking this morning. As you said, we are a leading expert in the Bakken formation, have been there from the beginning. Continental is the largest producer of the Bakken resource in Montana and North Dakota and also the entire Wilson Basin. Our production is about 70 percent oil and, you know, we are known as an oil company.

I also serve as an energy advisor currently to Governor Romney but I am not here representing any campaign, any political party. I am just here as an American, an American patriot, someone that started with nothing, a one-truck operation, you know, the son of a sharecropper that had 13 kids, the last of 13, built a small, one-truck operation into a large leading energy company in America.

Very exciting day to talk about the great American promise of energy independence within this decade. For far too long, we stood under OPEC dominance as producers some 40 years. People lost the will to look for oil in this country. They couldn't do it. Every time we got to work, you know, OPEC would turn the taps on and drown us, put us out of business. It finally got down to where nobody was looking for oil. Everybody was looking for natural gas in this country. Finally, the day came that they didn't have excess capacity any longer that they could drown us like that so we could go back to work, and we did.

And we came out with some great things, the great technology of today, and that one technology that has been developed, primarily by our company and others, independent companies over the past 15 years, primarily, has been one thing, and that is horizontal drilling. And as an explorationist and a geologist, I can tell you that this was a wonderful breakthrough. It drowns out all the breakthroughs of the past, you know, 2D seismic, for instance, that saw a bump in production in the United States and the world, 3D seismic that came out that everybody was so excited about in the early 1990s, and here we are today talking about something that dwarfs all of those, and that is horizontal drilling: the ability to drill down 2 miles, turn right, drill 2 to 3 miles further and hit your lapel pin if we want to. So it is that technology, that precision that has been adopted out there. And what that allows us to do, it allows us to enter another world, the world of immobile oil. We have been producing mobile oil, the stuff that would move to you, trapped in different reservoirs all over, and that is what we have been chasing all this time. Today we can go after the source rocks themselves where the oil is stored, tight rocks, heavy oil, tar sands, all those things that we couldn't get to before. So it is an entire new world of geology that is out there waiting for us and we are able to do that successfully repeatedly across the Nation, and we have been doing that for the past 15 years and the result is tremendous as to what has happened.

So we look at what that result is. In 2005, we thought we were running out of natural gas. Everybody thought we were going to be about out. And we had about 7 years' supply at that time, current production that would sustain us, reserves. Now we are at about 125 years, a lot of these shale resource plays that we are able to tap into, natural gas across the country. But then we have a few that are oil, and what do we got there? Well, we have seen great, great fields come on. The Bakken is certainly a good example of that. You know, with the technology that we have today, we can get into that tight rock, you know, where the Bakken oil was generated and stored over time, and it is a tremendous resource.

So today we are the number one natural-gas producer in the world, and today we are the number two crude-oil producer in the world. A lot of people don't realize that statistic. We just passed Russia in oil production. We are just slightly behind Saudi Arabia in oil production. So we get back to that old thing, supply and demand. You know, we are bringing on a lot of new supply. You will hear people talk today about the 3 to 5 million barrels a day that we are going to increase production before 2020, and you ask if this new energy renaissance is achievable. Hardly any of the scientists

that know what the drill is today will say that that is not achievable because it certainly is achievable, and it is a great promise for our country. We are finally out from under OPEC dominance, and it means so much, the stability of our Nation, national security, you know, the jobs. You mentioned all those things. Good things flow from American oil and there is a tremendous amount of it, and I am excited to talk about all those.

I see my time is up. Thank you.

[The prepared statement of Mr. Hamm follows:]

American Energy Independence Within a Decade

and The Policies Necessary to Achieve it

Harold Hamm

Chairman and Chief Executive Officer

Continental Resources, Inc.

September 13, 2012

Summary

You will hear from me today from the perspective of that seasoned explorationist who has been in the business of finding oil and gas for the past 45 years. And I'm here today to talk to you about the viability of American energy independence.

I am here to testify to the policies needed to insure North American Energy Independence in the next decade.

There are three basic policies needed to continue the march towards North American energy independence.

1. Reasonable and consistent environmental regulations
2. Encouraging development of federal lands
3. Maintain tax policies that let us keep our own money to drill.

America is endowed with an estimated 139.6 billion barrels of recoverable oil—enough to replace Persian Gulf imports for the next 50 years. **We also have undiscovered technically recoverable natural gas of 1445.3 trillion cubic feet.** I encourage you to make sure we have sound policies in place so that this energy revolution continues to produce jobs, security and economic benefit for all Americans.

Chairman Whitfield and Members of the Committee it's an honor to be here today.

My name is Harold Hamm and I'm Founder, Chairman and Chief Executive Officer of Continental Resources. Founded in 1967 and based in Oklahoma City,

Continental is a Top 10 petroleum liquids producer in the United States and the largest leaseholder in the nation's premier oil play, the Bakken Play of North Dakota and Montana.

I'm here today to talk to you about the reality of North American energy independence and what it will take to get there within the next decade. I am also an energy policy advisor to Governor Romney. But I am not here representing Continental Resources, any political campaign or political party. I am here as an American patriot that loves my country and a person that is grateful for the opportunities I have been given by being an American. Only in America can the thirteenth child of a sharecropper turn a one-man, one-pump-truck operation into one of the nation's largest oil companies.

I am excited about our energy future and therefore our economic future. But I am equally concerned about Federal policies that could cost us that future.

Just a few years ago, America was importing 60 percent of its oil. But with technological advances in horizontal drilling over the last 15 years, we now import less than 45 percent of our oil. Just a few years ago we estimated our nation's natural gas reserves at seven years. We now have natural gas reserves of over a century. With this extraordinary advance in technology we can now access the immobile oil and natural gas of the world. Previously to this point we were only able to produce the world's mobile oil and natural gas. There is about 1/3 more immobile oil and natural gas than the mobile oil and gas we have produced for over a century. The technology that allows us to drill two miles down, turn right, go another two miles and hit a target the size of a lapel pin has unlocked the resources that make energy independence a reality.

This paradigm shift in American oil and gas exploration brings with it high-paying jobs, increased tax revenues, and economic growth, while lessening our dependence on foreign oil.

This march to North American energy independence depends on three factors:

1. It requires substantial amounts of capital. While these new found reserves are vast they are more costly to harvest. The average Bakken well costs around $10 million.
2. It requires a regulatory regime based on hard science where the cost of any new regulation results in a commensurate environmental benefit.
3. It requires opening federal lands and offshore areas for development.

Let me talk straight. Many members of Congress, from both sides of the aisle, understand this potential and support policies needed to keep this paradigm shift in American energy moving forward. Really we don't need anything else, except sound policy.

The tax provisions in place for over 50 years that let us keep our own money to reinvest in drilling are crucial to keep this energy revival going.

We support comprehensive tax reform. When that process begins we should all be willing to make the case as to why provisions in the code are beneficial to all Americans. We will make the case that the repeal of these tax provisions would result in as much as a 40% decrease in drilling activity and stop this American energy renaissance. Some call this expensing of ordinary business expense a "subsidy". Now my recollection of what a subsidy means is when you are given money to do something. I guess when I drilled 17 dry holes in a row I missed that pay window. No one sent me a check.

These same tax provisions not only allowed us to survive the disastrous years of OPEC dominance and decades of sub-economic oil and gas prices here in America, but most importantly, they allowed us to try new things and fail, and try again and fail, until we finally succeeded in "breaking the code" to produce the vast resource plays (even the source rocks themselves) like the Bakken in Montana and North Dakota. Continental's effective tax rate is 38%!

We need reasonable and consistent regulatory policies guided by science and not fear.

We are currently experiencing an onslaught of proposed new regulations that raise our cost without producing a commensurate level of environmental benefit. Federal agencies are in many cases abusing their authorities by broadly interpreting the laws resulting in punitive new regulations or so called "guidelines;" oftentimes ignoring due process. Another enigma is the hype over hydraulic fracturing. Legislation and regulations should be promulgated to address a problem. There has not been one instance of contamination to ground water attributed to hydraulic fracturing in the 60 year history of this common-place procedure. There are many good reasons for this; not the least of which are the states' programs regulating the protection of ground water. In many cases, these regulations have been in place since the early 1900s. Many of the states have over 100 years of experience in regulating the oil and natural gas industry. They have the specific knowledge of their states geology and the experience and man power to carry out a rigorous regulatory regime.

Opening Federal lands for drilling would further guarantee North American Energy independence. But federal policies are inhibiting instead of encouraging tapping this national resource treasure. Why?

At Least Sixty-Two Percent of the known Oil Resources on Federal Lands Are Off-Limits. Based on resource estimates, these lands contain about 62 percent of the oil on federal land (19.0 billion barrels) and 41 percent of the natural gas (94.5 trillion cubic feet).

In the last three and a half years:

- The rate of leasing has slowed by half
- Land under lease has declined by nearly twenty percent
- It takes 307 days to receive a Drilling Permit on Federal land. This length has doubled since 2005 and, in the last three years, the amount of time that industry must take to "resolve any deficiencies" in an application has tripled
- The rate of permitting has declined by more than one-third
- By comparison, it only takes 10 days to get a permit to drill on North Dakota State lands
- In Ohio it takes 14 days
- In Colorado the wait Is only 27 days

Incidentally, more drilling on federal lands would impact my company very little. Because of all the factors I just mentioned, we have very little acreage on federal lands. We mainly work on private lands. You can see why!

Good things flow from American oil and natural gas, and we are blessed with a huge supply that is ready to be tapped. The result would be more high-paying jobs, more tax revenues, and stronger economic growth.

For example, a new rig in North Dakota doesn't just benefit the economy there; it ripples out across the country—creating steel industry jobs in the midwest, pipe-fitting jobs in the east, and trucking jobs across the United States. Every new barrel of American-produced oil creates benefits that flow across the country.

America now leads the world in natural gas production. We have over 100 years of reserves, and the low cost of natural gas is bringing manufacturing and chemical processing back to America, creating thousands of jobs.

The benefits of American oil and gas include:

- The oil and gas industry helps support 9.2 million high-paying jobs directly and indirectly in the U.S. economy.
- With the right government policies in place, the oil and gas industry is poised to create an additional 3.6 million jobs by 2020.
- The oil and gas industry keeps dollars, jobs and tax revenues in America
- Oil And Gas Companies Pay More To The Government Than Any Other Industry. All told, the government rakes in $86 million from oil and gas every day -- far more than from any other business
- The path to American energy independence reduces America's dependence on imported oil from unstable regions of the world

America is endowed with an estimated 139.6 billion barrels of recoverable oil -- enough to replace Persian Gulf imports for the next 50 years. We also have undiscovered, technically recoverable, natural gas of 1445.3 trillion cubic feet

I encourage you to make sure we have sound policies in place so that this energy revolution continues to produce jobs, security and economic benefit for all Americans. Thank you.

Sources:

- ***Oklahoma Independent Petroleum Association, 2009 Fall Conference, Elizabeth K. Brown***
- ***Independent Petroleum Association of America***
- ***2009 Bureau of Labor Statistics Data***
- ***2009-2012 Energy Information Administration Data***
- ***Standard & Poor's Compustat North American Database***
- **The often-mentioned goal of U.S. energy independence could become reality by the end of the decade, according to analysts with Raymond James. As early as 2020, net U.S. crude imports will "reach essentially zero" thanks to booming oil production in Texas and North Dakota, growth in biofuel output and rapidly falling demand. (Raymond James)**

- **The cumulative impact of new production, reduced consumption, and associated activity may increase real GDP by 2 to 3%, creating from 2.7 million to as high as 3.6 million net new jobs by 2020. Furthermore, the current account deficit could shrink by 2.4% of GDP, a 60% reduction in the current deficit, by 2020. This may also cause the dollar to appreciate in real terms by +1.6 to +5.4% by 2020 (Citi GPS)**

- **These estimates suggest that the energy sector in the next few decades could drive an extraordinary and timely revitalization and reindustrialization of the US economy, creating jobs and bringing prosperity to millions of Americans, just as the national economy struggles to recover from the worst economic downturn since the Great Depression. (Citi GPS)**

- **("Inventory Of Onshore Federal Oil And Natural Gas Resources And Restrictions To Their Development," U.S. Departments Of The Interior, Agriculture, And Energy, 2008**

- **("Summary Of Onshore Oil & Gas Statistics," Bureau Of Land Management, 11/9/11)**

- **(Dina Cappiello, "Obama Moves To Speed Up Drilling On Public Lands," The Associated Press, 4/4/12)**
- **.("Average Application For Permit To Drill (APD) Approval Timeframes: FY2005-FY2011, BLM, 6/22/12)**
- **Federal drilling permits approved FY2006-2008: 20,479; FY2009- 2011: 12,821. ("Summary Of Onshore Oil & Gas Statistics," BLM, 11/9/11)**
- **By (Bruce E. Hicks, "4th Quarter Report Oct-Nov-Dec 2011," Oil And Gas Division, Department Of Mineral Resources, North Dakota Industrial Commission, 3/19/12**
- **("2011 Ohio Oil and Gas Summary," Ohio Department of Natural Resources, 2011)**
- **("Memorandum To The Colorado Oil and Gas Conservation Commission," Colorado Department Of Natural Resources, 4/25/11)**
- (Editorial, "Big Oil, Bigger Taxes," *The Wall Street Journal*, 3/15/12)
- **"U.S. proved reserves of oil total 22.3 billion barrels, and reserves of natural gas total 272.5 trillion cubic feet. Undiscovered technically recoverable oil in the United States is**

139.6 billion barrels, and undiscovered technically recoverable natural gas is 1445.3 trillion cubic feet." (Carl E. Behrens, et. al, "U.S. Fossil Fuel Resources: Terminology, Reporting, and Summary," CRS, 12/28/11)

Mr. WHITFIELD. Thank you, Mr. Hamm.

Dr. Ahn, you are recognized for 5 minutes.

STATEMENT OF DANIEL P. AHN

Mr. AHN. Chairman Whitfield, Ranking Member Rush and Chairman Upton and distinguished members of the committee, thank you for the opportunity to testify at today's American Energy Initiative hearing.

My name is Daniel Ahn, and I am the Chief Commodities Economist at Citigroup in New York. Earlier this year, my colleagues and I published a report entitled "Energy 2020: North America, the New Middle East," and I would like to take the opportunity to share and update its conclusions. North America has recently become the fastest-growing hydrocarbon producer and exporter in the world, and this trend should accelerate to the end of the decade. This energy renaissance has been driven by both declining domestic consumption and the successful deployment of new technologies to extract hitherto inaccessible oil and gas resources, particularly in tight and shale rock formations using horizontal drilling and hydraulic fracturing techniques. These two trends, declining demand and burgeoning supply, should have dramatic consequences for national energy security and for the domestic and global economy.

I will echo the chairman's opening statement and state that I estimate that new U.S. oil and gas production could add at least $200 billion and possibly $300 billion in revenue and in turn could stimulate many hundreds of billions more in economic activity, investment, consumption, and create at least 2 million and possibly as high as 3–1/2 million new jobs. Furthermore, American dependence on imported oil outside of North America should shrink or even be eliminated entirely. The current account deficit, which had seen trillions of dollars pass from American consumers on to foreign oil exporters, could be slashed by two-thirds. This would strengthen the credibility of the U.S. dollar as the world's reserve currency of choice.

Global oil prices could fall by 15 or even 20 percent. Energy-intensive manufacturing industries such as petroleum refining, petrochemicals, fertilizers, iron, steel, aluminum smelting, all should strategically benefit. Natural-gas-fueled vehicles could proliferate on American roads.

Distinguished committee members, a minor industrial revolution is in the making in our heartland. This is testament to the technical ingenuity and flexibility of American workers and enterprises and the bounty of our natural resources.

With that, I look forward to further discussion and questions during the rest of the hearing. Thank you.

[The prepared statement of Mr. Ahn follows:]

Written Testimony of
Daniel P. Ahn, Ph.D.
Chief Commodities Economist
Citigroup, New York

Hearing on the "American Energy Initiative"

U.S. House of Representatives
Energy and Power Subcommittee
Committee on Energy and Commerce

September 13, 2012

Introduction

Committee Chairman Upton, Chairman Whitfield, Ranking Member Rush, and distinguished Members of the Committee, thank you for the opportunity to testify at today's American Energy Initiative hearing. My name is Daniel Ahn and I serve as the Chief Commodities Economist at Citibank in New York. Earlier this year, my colleagues and I published a report entitled, "Energy 2020: North America, the New Middle East?" and I would like to take the opportunity to share and update its conclusions.

North America has recently become the fastest growing hydrocarbon producer and exporter in the world and this trend should accelerate to the end of the decade. This energy renaissance has been driven by both declining domestic consumption and the successful deployment of new technologies to extract hitherto inaccessible oil and gas resources, notably in tight and shale rock formations.

These two trends - declining demand and burgeoning supply- should have dramatic consequences for national energy security, as well as the U.S. and global economy. I estimate that new U.S. oil and gas production could add at least $200 to $300 billion dollars in revenue, which in turn could stimulate many hundreds of billions more in economic activity, investment, and consumption, creating at least two and as high as three and a half million new jobs.

Furthermore, American dependence on imported oil outside of North America should shrink or even be eliminated entirely. The U.S. current account deficit, which saw trillions of dollars passed on to foreign oil exporters, could be slashed by two thirds, strengthening the credibility of the U.S. dollar. Global oil prices could fall by 15% to 20%. Energy-dependent manufacturing industries such as refining, petrochemicals,

fertilizers, iron, steel, and aluminum smelting should strategically benefit. Natural-gas fueled vehicles could proliferate.

Distinguished committee members, a minor industrial revolution is in the making in the American heartland, testament to the technical ingenuity and flexibility of American workers and enterprises and the bounty of our natural resources.

The North American Energy Revolution

The United States (and North America more broadly) is in the midst of a historic energy revolution that could see its total supply rival that of Saudi Arabia or Russia in global oil and gas markets. To place this in historical context, the United States was once the world's largest oil producer for much of the 20th Century, after Russian production collapsed during the Revolution of 1917. The United States maintained this status for half a century, notably providing the oil necessary to fuel the critical Allied war effort throughout the two World Wars. However, faced with aging fields, American production peaked in 1970 and subsequently declined despite new production from Alaska. Increasing reliance upon imported oil proved a critical economic vulnerability during the oil shocks of the 1970s, fueling a painful period of economic malaise and high inflation.

But 2007 proved a turning point, with record-high oil prices above $100 per barrel triggering two transformative factors that proved the "peak oil" pundits wrong again. First, domestic production has made a dramatic comeback, most remarkably from tight geological formations such as shale oil and shale gas, thanks to the combination of horizontal drilling and hydraulic fracturing. This has been supplemented by burgeoning

supplies from deepwater offshore drilling, tar sands, gas-to-liquid conversion, and other sources.

Second, American consumption has dramatically fallen since 2007. Part of this is attributable to the deep economic recession of 2008. However, even after the overall economy bottomed out and grew again in 2009, U.S. oil demand has continued to fall. Research suggests this is the delayed structural reaction to the record oil price increases of the 2000s, as seen in decreasing industrial and residential/commercial demand and flattening automobile usage.

We project that these trends, both on supply and on demand, may continue and even accelerate to the end of the decade, driving a tectonic shift in the global energy landscape.

Energy Supply and Demand Projections to 2020

- From 2011 to 2020, we project U.S. petroleum liquids production to rise from 9 to 15.6 million barrels per day, an increase of +6.6 million barrels per day, about 7-8% of current global supply. Tight/shale oil and deepwater supply are the largest source of new production, but conventional production from Alaska, heavy oils, gas-to-liquids, bio-fuels, and other sources also contribute.
- We project U.S. dry gas production to rise from 62 billion cubic feet per day in 2011 to 76 billion cubic feet per day by 2020, an increase of +14 billion cubic feet per day , roughly 6% of current global supply. The lion's share of this comes from shale and tight gas, but associated gas, coal bed methane, and other sources also contribute.

- We project U.S. domestic demand to fall by another -2 million barrels per dayfrom 19 million barrels per dayin 2011 to 17 million barrels per dayby 2020, thanks to lower gasoline demand, improved industrial and vehicle efficiency standards, and switching from liquids to natural gas.

I stress that these projections were not meant to be forecasts but rather a benchmark of what is geologically, technologically, and economically achievable in the absence of other constraints.

To put this in perspective, the incremental increase in supply from the United States alone is greater than the current total production of Iran and Iraq combined. This should drive the United States to approach or even surpass Russia and Saudi Arabia as the world's foremost hydrocarbon producer by 2020. Coupled with the less celebrated but no less important structural decline in U.S. oil demand, the pieces are in place for North America to become virtually self-sufficient in hydrocarbons by 2020. Energy independence is within reach.

Impact on the U.S. and Global Economy

The energy revolution would not only upend the global energy market and strengthen U.S. energy security but also drive something akin to a miniature "Industrial Revolution" in the United States, with hundreds of billions of dollars in new economic activity, the reindustrialization of the U.S. manufacturing sector, more income in consumer wallets, and millions of new jobs. Coming at a time when the United States is still struggling to shake off the aftermath of the 2008 recession, it appears almost too good to be true.

On top of the booming hydrocarbon extraction industry itself, the economic renaissance should be spearheaded by those commercial sectors best placed to take advantage of inexpensive energy inputs, such as petroleum refining, petrochemicals, fertilizers, iron, steel, and other metals smelting, clay, glass, paper, etc. For example, the U.S. has already become the second lowest-cost producer of ethylene, a key component of plastics and other petrochemicals.

Beyond this, the energy boom should generate significant "multiplier" effects as firms make new orders for machinery and other investment goods and services, hire new workers that increase consumption for other goods and services, and thereby ripple through the economy and drive virtuous cycles of economic activity, This multiplier effect should be magnified as this stimulus is coming when the United States is still growing below economic potential and has large idled capacity and millions of unemployed workers.

The complexity and interconnectedness of the U.S. economy and the nature of counter-factual analysis makes assessing the overall economic impact of this energy revolution a difficult endeavor. For example, one must take into account how an additional dollar in the paycheck of an oil rig worker may cause him to buy that new toaster he needs. But this new demand for toasters increases the price of toasters everywhere. This in turn causes general inflation to rise, which may cause the Federal Reserve to tighten monetary policy earlier than it otherwise would have. This in turn would sway the decision of the oil rig worker whether to buy a new toaster or not. Nevertheless, with the aid of a computer model, in effect a simulated miniature U.S. economy, some credible estimates can be calculated.

Economic Impact Estimates

- I estimate that U.S. real Gross Domestic Product (GDP) by 2020 should be 2.0 - 3.3% or from $370 to $640 billion (in 2005$) higher than it otherwise would have been. In other words, the U.S. economy would grow +0.25 to +0.4% faster on average per annum to 2020.
- 1.4% or $270 billion of this additional economic output comes directly from the oil and gas supply windfall. An additional $90 billion (0.5% of GDP) comes from the savings that consumers enjoy thanks to lower demand for oil. Finally, an additional $260 billion (1.3% of GDP) comes from "multiplier" effects.
- This new economic activity may generate from 2.2 to as many as 3.6 million new jobs. Perhaps 1.6 million new jobs would be created in the manufacturing sectors, with the remaining two million jobs in the broader economy.
- The current account deficit, at -3.2% of GDP or -$496 billion as of 2011, may fall to as low as -0.8% of GDP, or an elimination of more than two thirds of the U.S. current account deficit.
- Thanks in part to the lower current account deficit and improved creditworthiness, the U.S. dollar should appreciate from +1.6% to +5.4% in real terms.
- Lastly, the new supply and lower demand may cause global oil prices to decline by 15-20%, from current $100-120 per barrel range to the $70-90 per barrel range, with dips as low as $50 per barrel.

Risks and Policy Challenges

As mentioned above, the projections above are a "good-case" scenario where the full geological, technological, and economic potential of American hydrocarbon resources are unleashed. But significant risks confront the full realization of this scenario. Careful studies are required to allow the development of a proper regulatory framework that safeguards U.S. environmental, economic, and strategic goals without choking off market efficiency. A full discussion of the risks and policy challenges would take many more hearings, but one can generally categorize these into four buckets:

Categories of Policy Risks and Challenges

- Technical and Logistical
- Environmental
- Economic
- Geopolitical

The most obvious challenge is the need for thousands of workers and skilled technicians and sophisticated machinery to actually extract the oil and gas. However, national oil and gas companies have increased their total capital expenditures on labor, machinery, and other investment spending six-fold since the 1990s, while costs only grew three-fold and now appear to have plateau-ed and possibly even begin to decline.

Also daunting are the logistics of properly storing and transporting this burgeoning supply of oil and gas from the American midcontinent to the population centers on the coasts, when the national pipeline infrastructure had been historically geared toward absorbing petroleum from the Gulf of Mexico and the Atlantic Basin into

the midcontinent. The controversy around TransCanada's Keystone XL pipeline expansion is a poster child of the policy challenges.

Environmentally, the main concerns revolve around hydraulic fracturing, and its impact on emissions, water supplies, and seismic activity. The Environmental Protection Agency is scheduled to release a widely anticipated scientific study on the impact of hydraulic fracturing on drinking water later this year.

Even economically, the energy revolution is not an unmitigated boon. For example, the United States may confront a relative decline in the non-energy-intensive areas of manufacturing due to the strengthened U.S. dollar that hurts export competitiveness and the diversion of resources and labor from these sectors to the energy sector, a phenomenon known as "Dutch disease."

Geopolitically, the United States may be tempted to bask in its new energy independence and retreat from its security obligations around the world. But the expression "energy independence," by which people typically mean hydrocarbon net self-sufficiency, should not be confused with the absence of interdependence. The globally integrated and fungible nature of oil markets has tightly bound all consumers and producers together. To borrow an image from William Nordhaus, one can think of the oil markets as a large bathtub in which producers fill and consumers draw out simultaneously. Hence, even if the United States was completely self-sufficient, a disruption in supply would drive prices up around the world, including the United States, in tandem.

Conclusion

Distinguished members of the Committee, we share the privilege of observing in our lifetimes a remarkable technology-driven revolution in the U.S. and North American energy scene, one that holds great promise in improving our economy and national security. Challenges and risks confront us but with the proper study and consideration, I am confident that they can be met.

Executive Summary of Written Testimony

Daniel P. Ahn, Ph.D., Chief Commodities Economist, Citigroup, New York
Hearing on the "American Energy Initiative"
U.S. House of Representatives
Energy and Power Subcommittee
Committee on Energy and Commerce
September 13, 2012

1. The United States and North America more broadly, is in the throes of a historic energy revolution, driven by two factors: declining consumption and growing production.

2. Gasoline and other refined petroleum consumption in the US have been in decline since 2007, in part due to cyclical economic weakness but also structural factors. This structural trend is expected to continue due to demographic shifts, higher vehicle efficiency standards, and other energy efficiency savings.

3. Meanwhile, North American production of hydrocarbon liquids and gas has skyrocketed. Most notably, new production from unconventional sources such as tight and shale rock formations have been made possible thanks to the deployment of hydraulic fracturing and horizontal drilling technologies.

4. Given the confluence of these two factors and what is geologically, technologically, and economically feasible, we project that North America can potentially achieve energy independence (i.e. oil/gas net self-sufficiency) by 2020.

5. The economic consequences of this energy revolution are momentous. The United States may see a minor Industrial Revolution, led by the energy and energy-intensive manufacturing sectors, but generating virtuous cycles of job-creating activity through the rest of the economy.

6. I estimate that the cumulative economic impact would be 2% to 3.3% of US real GDP (+0.25% to +0.4% faster growth on average per annum), creating as high as 2 to 3.6 million new jobs.

7. The US current account deficit may decline by two thirds or more, strengthening the US dollar as the global reserve currency of choice and improving our national credibility. Furthermore, long-term oil prices may decline by 15-20%, lessening the drag of high energy prices on the US and global economy.

8. However, risks and challenges remain that may prevent the full realization of this vision, particularly in four categories: logistical, environmental, economic, and geopolitical. These diverse challenges must be met with a proper regulatory framework that properly balances US environmental, economic, and strategic goals.

Mr. WHITFIELD. Thank you, Dr. Ahn.

Mr. Freeman, you are recognized for 5 minutes.

STATEMENT OF JOHN FREEMAN

Mr. FREEMAN. Thank you. I would like to take this opportunity to thank all the members of the committee including Chairman Upton, Ranking Member Waxman and specifically would like to thank Subcommittee Chairman Whitfield and Ranking Member Rush for holding this hearing and inviting me to testify on behalf of Raymond James. My name is John Freeman. I have worked as a part of the Energy Research Group at Raymond James since 2000 together with my colleague, Pavel Molchanov, who joins me in the room. I welcome the opportunity to appear before the committee and share our team's perspectives on the progress the Nation is making towards energy independence.

America is already a major exporter of coal, and together with Canada, we are already self-sufficient when it comes to natural gas, and for the first time in over 50 years, there is clear visibility on how oil independence can be achieved. Many of the themes I am going to describe today are sustainable trends driven by the private sector, and they can continue for a long time, even without additional policy steps. However, Congress can and should play a constructive role in accelerating these trends and supporting industry efforts along the way.

The Nation's all-time peak for petroleum imports was in 2005 at 13–1/2 million barrels a day. By 2011, imports were down to 9.7 million barrels a day. That reduction in imports was almost evenly balanced between rising domestic production and declining consumption, and we believe imports can disappear entirely by as early as 2020.

All of you are aware of the unprecedented boom in unconventional drilling activity across the United States. This game-changing trend first materialized in the natural-gas industry and led to the United States becoming the largest natural-gas producer in the world. In the oil industry, the unconventional boom began a bit later but we think the real inflexion point is now upon us. This year alone, we project a supply increase of nearly 1 million barrels a day, about as much as the prior 2 years put together. In fact, we forecast the United States will become the largest oil producer in the world before the end of this decade.

Despite the impressive production growth the industry is accomplishing, it does not come without its share of challenges. One of these will be difficult for this committee to do anything about, and that is what we refer to as the graying of the oil patch. The average U.S. petroleum engineer is 50 years old. Some of the most active drilling areas such as the Bakken in North Dakota have widespread labor shortages across the spectrum. It is no surprise that North Dakota has the lowest unemployment rate of any State.

The other two constraints are issues that Congress has more influence over. One is the development of pipeline infrastructure, and while very few pipeline projects will achieve the political notoriety of Keystone, permitting bottlenecks can still slow down the process, especially at it pertains to Federal lands. The growth in drilling activity in recent years has been much more visible on private and

State lands rather than Federal lands, which reflects the more stringent regulatory scrutiny associated with Federal lands. The challenge here is to balance prudent environmental protection with the industry's needs.

If I turn to demand, the Nation's oil demand began to fall well before the onset of the financial crisis in 2008. Between 1992 and 2005, demand was up every single year except one. Since 2005, demand has fallen every year except one.

There are four long-term drivers, and in our view will result in a sustained decline in U.S. oil demand. The first driver is ongoing improvement in fuel economy. Between 2006 and 2011, the increase in average fuel economy of actual passenger car sales improved more in absolute terms than it had in the 15 years combined prior to that.

Second, there is an ongoing decline in vehicle miles traveled. The use of public transport, greater reliance on Internet commerce, the fact that the number of automobiles per household peaked in 2007, due in part to demographics, are just some of the factors driving this trend.

The final two reasons involve a shift from oil to natural gas in the petrochemical industry as well as in transportation. The cost advantages of the U.S. chemical industry compared to its overseas competitors helps explain why many new chemical plants are in development. And oil-based feedstocks have been cut in behalf since 2005. Transportation is another emerging arena for natural-gas usage due to the cost advantage over oil.

In conclusion, America is blessed with an abundance of natural resources. We are the largest producer of natural gas in the world, the second largest producer of coal, and in the next several years will become the largest oil producer in the world. The future has never been brighter for achieving energy independence.

Thank you, and I look forward to your questions.

[The prepared statement of Mr. Freeman follows:]

RAYMOND JAMES®

September 11, 2012

The Honorable Fred Upton
Chairman
Committee on Energy and Commerce
2125 Rayburn HOB
Washington, D.C. 20515

The Honorable Henry Waxman
Ranking Member
Committee on Energy and Commerce
2204 Rayburn HOB
Washington, D.C. 20515

The Honorable Ed Whitfield
Chairman
Subcommittee on Energy and Power
2368 Rayburn HOB
Washington, D.C. 20515

The Honorable Bobby L. Rush
Ranking Member
Subcommittee on Energy and Power
2268 Rayburn HOB
Washington, D.C. 20515

Re: The American Energy Initiative: A Focus on the Outlook for Achieving North American Energy Independence Within the Decade

Dear Chairmen Upton, Whitfield and Ranking Members Waxman and Rush:

On behalf of Raymond James & Associates, Inc., I would like to take this opportunity to thank all the Members of the Committee including Chairman Upton and Ranking Member Waxman for their important work on this Committee. Additionally, I would like to specifically thank Subcommittee Chairman Whitfield and Ranking Member Rush for holding this hearing and inviting me to testify on this very important topic of energy independence.

Respectfully yours,

John Freeman, CFA
Managing Director, Equity Research
Raymond James & Associates, Inc.

Encls.

880 Carillon Parkway · St. Petersburg, FL 33716 · T 800.248.8863 · raymondjames.com
Raymond James & Associates, Inc., member New York Stock Exchange/SIPC

Before the Committee on Energy and Commerce, Subcommittee on Energy and Power

September 13, 2012

Testimony of John Freeman, Energy Research Group, Raymond James & Associates

I would like to take this opportunity to thank all the Members of the Committee including Chairman Upton and Ranking Member Waxman for their important work on this Committee. Additionally, I would like to specifically thank Subcommittee Chairman Whitfield and Ranking Member Rush for holding this hearing and inviting me to testify on behalf of Raymond James & Associates, Inc.

My name is John Freeman, and I have worked as part of the Energy Research Group at Raymond James & Associates, Inc. since 2000. Together with my colleague Pavel Molchanov, who joins me in the room, I welcome the opportunity to appear before the committee and share our team's perspectives on the progress the nation is making towards energy independence. America is already a major exporter of coal, and together with Canada, is self-sufficient when it comes to natural gas. And for the first time in over 50 years, there is clear visibility on how oil independence can be achieved within a foreseeable period of time. Many of the themes I will describe today are sustainable trends, driven by the private sector, and they can continue for a long time even without additional policy steps. However, Congress can play a constructive role in accelerating these trends and supporting industry efforts along the way.

A summary of my comments are attached hereto as Exhibit A. My comments will be based on research reports that our team has published this year on the topic of energy independence, attached hereto as Exhibits B, C, and D. I will start by talking about oil supply, and then demand. The nation's all-time peak for net petroleum imports was in 2005, when 13.5 million barrels per day (MMbpd), or 65% of what is consumed, had to be purchased from abroad. By 2011, imports were down to 9.7 MMbpd, or 52% of

consumption. In other words, over a six-year period, 3.8 MMbpd of imports disappeared. That reduction in imports was almost evenly balanced between rising domestic production and declining consumption.

Let me share a statistic that would surprise most Americans. Between 2008 and 2011, the U.S. added more barrels to global oil supply than any other country. What's especially impressive is that this happened in spite of the deepwater drilling moratorium in 2010 and 2011, which of course had the effect of lowering production from the Gulf of Mexico. In other words, all of the production increase – a total of 1.6 MMbpd over three years – came entirely from onshore fields.

All of you are aware of the unprecedented boom in unconventional drilling activity across the continental United States. This game-changing trend first materialized in the natural gas industry, with the resulting collapse in North American natural gas prices. In the oil industry, the unconventional boom began a bit later, but we think the real inflection point is now upon us. This year alone, we project a supply increase of nearly 1 MMbpd, about as much as the prior two years put together. We project a similar increase in 2013, with sustained growth thereafter towards the end of the decade, though at a somewhat slower pace. In fact, we forecast the U.S. will become the largest oil producer in the world before the end of this decade.

Our forecasts are based on a detailed, basin-by-basin, well-by-well production model that our team built that covers all the major oil producing basins in the country. However, there are three primary areas that comprise the main building blocks of this surge in domestic production. They are the Bakken formation of North Dakota, the Eagle Ford Shale of South Texas, and the Permian Basin of West Texas. We project that the Bakken, Eagle Ford and Permian will comprise more than 80% of the nation's total production growth through at least 2015.

Despite the impressive production growth the industry is accomplishing, it has not come without its share of challenges. So, what are some of the constraints the industry faces? One of these will be difficult for this committee to do anything about, and that is what we refer to as the "graying of the oil patch". The average U.S. petroleum engineer is close to 50 years old, and the number of students in these programs at universities is insuffucient to fully compensate for the workers who are retiring. To make a broader point, some of the most active drilling areas have widespread labor shortages across the spectrum. North Dakota, for example, has the lowest unemployment rate of any state.

The other two constraints are issues that Congress and the executive branch have more influence over. One is the development of pipeline infrastructure to take oil from the high-growth production areas to the refining and distribution hubs, such as the Gulf Coast. While very few pipeline projects achieve the political notoriety of the Keystone XL pipeline, permitting bottlenecks can still slow down the process, especially as it pertains to federal lands. The second point is similar. The growth in drilling activity in recent years has been much more visible on private and state lands rather than federal lands, which reflects the more stringent regulatory scrutiny associated with federal lands. The challenge here is to balance prudent environmental protection with the industry's needs.

Let me turn to demand. As I noted at the beginning, both rising supply and declining demand have been just about equally important drivers behind the reduction in U.S. oil imports since 2005. Of course, part of this fall in consumption has been purely cyclical: a direct result of the Great Recession and the slow recovery since then. But the nation's oil demand began to fall well before the onset of the financial crisis. Between 1992 and 2005, demand was up every year but one. Since 2005, demand has fallen every year but one.

There are four long-term drivers that, in our view, will result in a sustained decline in U.S. oil demand at an average rate of around 1% per year. This is much slower than the rate of decline since 2005, because of course we are not assuming a repeat of the Great Recession, but it still accounts for 28% of the projected reduction in oil imports for the period 2011 through 2020. Alongside the supply surge, lower demand is accelerating the path towards oil independence. If demand does not decline as we project, oil independence will take longer to achieve. Assuming flat demand, for example, would mean an incremental 1.4 MMbpd of imports in 2020.

The first driver is the ongoing improvement in fuel economy. The committee is, of course, familiar with the CAFE standards mandating rising fuel economy, for which the Department of Transportation and EPA issued their final rule just two weeks ago. But consumer preferences have also undergone a remarkable shift over the past five years. Between 2006 and 2011, the increase in the average fuel economy of actual passenger car sales improved more in absolute terms than it had in the 15 years prior to 2006. Quite simply, high fuel prices provide a clear incentive to purchase vehicles that get better mileage.

Second, there is an ongoing decline in what the Bureau of Transportation Statistics calls vehicle-miles traveled. In parallel with changes in the vehicles that consumers buy, driving habits are changing as well. Anecdotally, reduced driving patterns can reflect things like shorter vacations. The use of public transport is on the rise, as consumers try to cut their own fuel costs. Other factors include greater reliance on Internet commerce relative to traditional shopping, growing popularity of higher-density urban living, and the fact that the number of automobiles per household peaked in 2007 due in part to demographics, namely the aging of the "baby boomer" generation.

The final two reasons involve a shift from oil to natural gas: in the petrochemical industry, as well as in transportation. This is not a matter of statutory mandates but rather the economic benefits from using cheap North American natural gas as compared to oil. The cost advantage of the U.S. chemical industry compared to its overseas competitors helps explain why many new chemical plants are in development. And in transportation, an emerging arena for natural gas usage, a gallon of fuel made from natural gas at today's prices costs less than half of conventional gasoline.

In conclusion, America is blessed with an abundance of natural resources. We are the largest producer of natural gas in the world, the second largest producer of coal, and in the next several years we'll become the largest oil producer in the world. The future has never been brighter for achieving energy independence.

Thank you very much, and I look forward to your questions.

Exhibits

EXHIBIT A

Before the Committee on Energy and Commerce, Subcommittee on Energy and Power

September 13, 2012

Summary of Testimony - John Freeman, Energy Research Group, Raymond James & Associates, Inc.

Supply:

- U.S. can become energy independent by 2020
- Before the end of this decade the U.S. will become the largest oil producer in the world
- Three areas (Bakken, Eagle Ford, Permian) will drive 80% of the production growth
- We added more barrels to global oil supply from 2008-2011 than any other country despite the deepwater drilling moratorium in 2010 and 2011

Demand:

- Net petroleum imports peaked in 2005 at 13.5 million barrels per day
- Since 2005, petroleum imports have declined 3.8 million barrels per day
- Since 2005, U.S. oil demand has fallen every year, but one (2010 rebound following 2009 recession)
- U.S. oil demand is forecasted to decline an average of 1% per year through 2020
- Main factors that are driving this decline in demand include fuel economy improvements (CAFE standards, changing consumer preferences) and decline in vehicle-miles traveled (demographics, internet commerce)

EXHIBIT B

RAYMOND JAMES | U.S. Research
Published by Raymond James & Associates

Energy

April 9, 2012

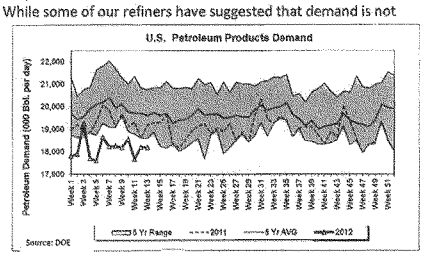
Industry Brief

J. Marshall Adkins, (713) 789-3551, Marshall.Adkins@RaymondJames.com
Pavel Molchanov, (713) 278-5270, Pavel.Molchanov@RaymondJames.com

Energy: Stat of the Week

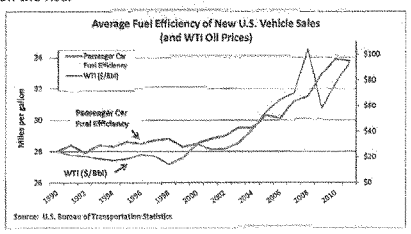
Why is U.S. Oil Demand Falling, and Will It Ever Grow Again?

Last week, we detailed why growing U.S. oil supply will likely drive the U.S. to oil import independence during this decade. While rising U.S. oil supply is clearly the lead actor, falling U.S. oil demand is starring as the best supporting actor. In fact, U.S. oil demand is on track for its steepest decline since 2009 despite improving unemployment and rising consumer confidence. According to the DOE's weekly data, U.S. oil demand (total of all petroleum products) is down 5.6% y/y so far this year. While roughly 1.5% of this decline reflects a statistical fluke after the DOE changed how it accounts for gasoline exports, the fact remains that even the "clean" DOE number is a hefty 4%. Perhaps more importantly, the petroleum product demand decline seems to be broad-based with gasoline, distillates, and other major categories all down over 5%. While some of our refiners have suggested that demand is not actually falling this fast, recent MasterCard gasoline consumption data confirms a 5.6% annual decline so far this year. Regardless of whether the real decline this year is 3% or 6%, it is clear that U.S. oil demand is falling, and falling fast. Today, we attempt to explain what is behind this decline and address the sustainability of this trend. To begin with, there is no one simple answer. Instead, we think there are numerous trends that are helping to push U.S. oil demand lower. This Stat focuses on the following four key drivers of falling U.S. oil demand: (1) rising fuel economy, (2) changing driving habits, (3) more natural gas vehicles, and (4) shift to more natural gas in petrochemicals. For all these reasons, we conservatively project that U.S. oil demand will be down 2.5% in 2012 and an average of 1.5% per year through 2020. Reality suggests that U.S. oil demand will be down much more than 2.5% this year. Longer term, the U.S. could be using less oil by 2020 than at any point since the mid-1980s.



Trend #1: More Priuses and no more Hummers – fuel economy is on the rise.

To state the obvious: when prices at the pump rise towards $4/gal, most consumers feel the pain acutely in their pocketbook. In the short run, there is not much they can do other than, well, drive less (i.e., fewer trips or more public transportation). Over time, as households make their next vehicle purchase decision, they naturally place a greater weight on fuel economy than they would have five or ten years ago. While increasing Corporate Average Fuel Economy (CAFE) standards and the government takeover of several U.S. auto companies has helped to facilitate this shift, the reality is that higher gasoline prices are the main driver of improving fuel efficiencies.



The numbers speak for themselves. In 2011, the average miles per gallon (mpg) rating of new passenger car sales was 33.8, up by 3.7 mpg since 2006. Remarkably, this five-year improvement is greater than it had been over the previous 15 years (1990-2006) combined. It is not an accident that sharply higher oil prices over the last five years have driven most of this shift in consumer preferences. For light trucks the story is similar as mileage ratings have increased nearly 3.5 mpg to nearly 25 mpg over the past five years. Keep in mind that for both cars and trucks, the normal replacement cycle means that less efficient (pre-2006) vehicles are

Please read domestic and foreign disclosure/risk information beginning on page 7 and Analyst Certification on page 7.

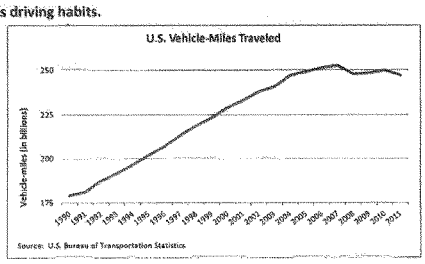
© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.
International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

increasingly being taken off the market. Going forward, under the federal CAFE standards, overall fuel economy of new vehicles must improve by 5% per year through 2016.

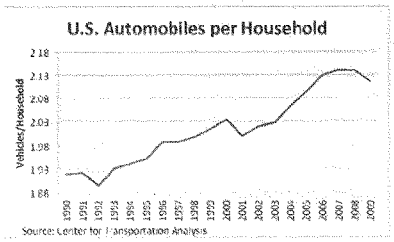
While the growing adoption of hybrids is certainly capturing political headlines, it remains a relatively small percentage (~2%) of U.S. auto sales. That said, Toyota sold nearly three times as many Priuses in 2011 as it did in 2004. And it's not just Priuses. Every major carmaker, including luxury brands, is selling hybrid models in the U.S. market. Plug-in hybrids, such as the Chevy Volt, are also gaining adoption, albeit from a tiny base... and, to be sure, the news stories about batteries on fire don't exactly help. Sales of true electric vehicles – which theoretically have infinite mpg ratings – are barely measurable for the time being, though you'll be hearing a lot more about them (mainly from politicians) in the coming years.

Trend #2: Decline in vehicle-miles traveled reflects more cautious driving habits.

As mentioned above, people are not just driving more fuel-efficient cars; they are also driving less. As shown in the adjacent chart, U.S. vehicle-miles traveled have clearly stagnated since 2004. Miles driven are even lower today than in the nightmarish recession plagued days of 2008-2009. Reduced driving patterns reflect many different things. The monthly data, for example, suggests that the summer driving season isn't giving as much of a boost as it used to, with many families choosing to drive shorter distances for summer vacations – or opt for a "staycation" altogether. Use of less fuel-intensive public transit is also on the rise. Amtrak ridership rose 4.5% in 2011 to a new high. (Keep in mind, the bulk of the Amtrak trains, especially in the heavily traveled Northeast Corridor, are electric – not diesel-powered.)



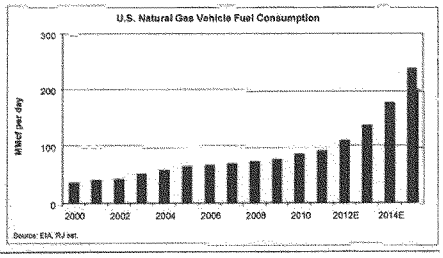
More cautious driving habits can also manifest themselves in the decisions of households with several vehicles over which one to use more. Imagine a two-car household that plans a camping trip. In years past, they would take the larger, roomier SUV. But now they want to save on fuel, so they opt to take the compact car instead. Decisions like this are not captured in vehicle-miles data, or new car sales data, but the effect on fuel consumption is real nonetheless.



Finally, demographics seems to be playing an important role in the fewer miles driven trend. As shown in the adjacent graph, the number of automobiles per household seems to have stagnated along with miles driven (yes, it would be nice to have the data through 2011). Is this because the baby boomers are retiring, or the recession has inspired more frugality, or households have finally realized they simply don't need more than two cars per family? We don't know exactly why, but it seems clear that the average U.S. family has finally reached an automobile saturation point over the past five years.

Trend #3: Even without the NAT GAS Act, fleet adoption of natural gas vehicles is starting to gain traction.

With the price spread between crude oil and natural gas currently above 40:1 in North America, it's no secret that the economics of natural gas fuels – compressed natural gas (CNG) and liquefied natural gas (LNG) – are exceptionally appealing. Let's be clear: the natural gas transportation market in the U.S. remains very marginal in the context of overall transportation fuel demand. DOE data states that only 90 MMcf/d of gas was used as vehicle fuel in 2011. This equates to ~300 million gallons of fuel, less than 1% of what we think of as the "addressable market" (buses,



© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

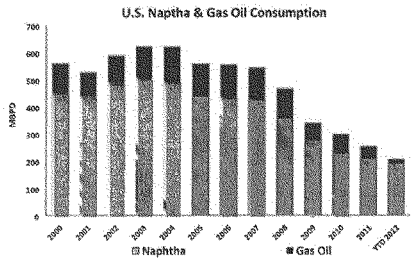
commercial light trucks, and freight trucks – fuel demand of ~40 billion gallons). Our channel checks indicate that actual usage of natural gas fuels is probably somewhat higher, but regardless, the natural gas transportation market is still in its infancy. The infant is beginning to teethe, however. In 2011, against the backdrop of a 1.8% decline in U.S. oil demand, DOE data shows consumption of natural gas fuels up 7.1%. As shown in the preceding chart, we project accelerating growth in the coming years, reflecting aggressive expansion in both fueling infrastructure and the availability of natural gas vehicles (NGVs).

So far, NGVs are overwhelmingly a commercial vehicle market. The newsflow you've probably seen about fleet adoption of NGVs certainly reflects that. Fleet operators (either governmental or private-sector) tend to think more strategically about the economics of vehicle options than ordinary consumers. And because fleet vehicles tend to drive a fixed route, a single fuel station at a central location is often all they need. Also important is the fact that the economics of natural gas fuel are intrinsically better for commercial vehicles. The reason is simple: The more miles a vehicle drives per year, the more it saves due to cheaper CNG/LNG pricing relative to gasoline/diesel. The end users for whom CNG/LNG makes the most economic sense include transit buses and waste trucks, both of which have massive mileage (and hence fuel) requirements. Next to them would be light commercial trucks and taxis. At the bottom of the list would be the typical consumer.

What encourages fleets to switch to NGVs? Quite simply, it is the fact that it's materially cheaper to produce a gallon of CNG than a gallon of gasoline. Since one Mcf of natural gas yields eight gallons of CNG, a $2.50/Mcf gas price (our 2012 forecast) implies a feedstock cost of only $0.31/gal. By comparison, $100/Bbl oil (with a barrel equating to about 42 gallons of refined product) equates to a feedstock cost of $2.38/gal. Of course, higher processing costs of CNG (approximately $1.00/gal, vs. $0.20/gal for conventional petroleum refining) offset some of that price differential. Adjusting the costs appropriately, CNG still comes out ahead with an all-in, pre-tax, "leaving the refinery" cost of $1.31/gal, vs. gasoline at $2.58/gal. (As a side note: The cost comparison is not exact because a barrel of crude oil produces a mix of various refined products, not all of which compete directly with CNG. In addition, government incentives, taxes, distribution costs, and profit margins are not taken into account here.)

Trend #4: Petrochemical producers are shifting from oil to NGLs.

Truckers aren't the only commercial users of oil that see the obvious benefits of switching to cheap natural gas. The U.S. petrochemical industry has been undergoing a major shift in its feedstock mix, away from oil and towards gas. As shown in the adjacent chart, the use of oil-based feedstocks (naphtha and gas oil) has been cut by more than half since 2005, with clear substitution in favor of gas-based feedstocks (ethane, propane, and butane). Between 2005 and 2011, the implied reduction in oil demand was ~300 Mbpd, which alone accounts for one-sixth of the total decline in domestic oil demand over this timeframe. Hypothetically, if the remaining use of naphtha and gas oil were to disappear completely, that would shave off another ~250 Mbpd (nearly 1.5%) from domestic oil demand. Given that we envision a continually wide disconnect between oil and gas prices as far as the eye can see, such a scenario is not an impossible one.



Source: Raymond James and Hodson data

Conclusion: U.S. oil intensity is set to keep falling.

While growing U.S. oil supply is clearly driving the U.S. toward energy independence, falling U.S. oil demand is providing a tailwind. We have noted in the past that, as economies become more developed, oil intensity peaks and begins to decline. In China, where oil intensity has begun to fall in recent years, absolute GDP growth rates remain high enough for oil demand to still move up. In the U.S. and other industrialized countries, however, it is now very difficult to achieve the level of GDP growth that's needed for oil demand to increase. In this Stat, we have detailed four of the key factors behind the recent sharp decrease (down roughly 5% YTD) in U.S. oil demand as well as why we expect these trends to continue. While there are numerous reasons for declining U.S. oil consumption, we have focused on the following four key drivers: (1) rising fuel economy, (2) changing driving habits, (3) more natural gas vehicles, and (4) shift to more natural gas in petrochemicals. All of these are secular themes; in other words, they are likely to persist for the next several years. Keep in mind, the U.S. continues to use more oil per capita than any other major economy, but the historical trend would suggest that oil intensity among various countries tends to converge over time.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

U.S. Rig Count Breakdown

	4/6/2012	3/30/2012	WAW Δ	YTD Δ	YTD % Δ	Y/Y Δ	Y/Y % Δ
Total Count							
U.S. Rig Count	1979	1979	0	(28)	-1%	197	11%
By Basin*							
Permian	481	476	5	26	6%	97	25%
Eagle Ford	260	257	3	24	10%	91	54%
Bakken	215	217	(2)	23	12%	47	28%
Marcellus	120	125	(5)	-18	-13%	1	1%
Granite Wash	77	73	4	6	8%	-5	-54%
Haynesville	73	74	(1)	-41	-36%	-86	-6%
Mississippi Lime	60	60	0	12	25%	37	161%
Cana Woodford	57	55	2	-1	-2%	2	4%
Barnett	52	55	(3)	-7	-12%	-26	-33%
DJ Basin	37	38	(1)	-5	-12%	-1	-3%
San Joaquin Basin	35	35	0	3	9%	8	30%
Uinta	33	34	(1)	3	10%	8	32%
Piceance Basin	21	21	0	-6	-22%	-9	-30%
Fayetteville	20	20	0	-6	-23%	-8	-29%
Pinedale	20	20	0	-9	-31%	-7	-26%
Powder River Basin	17	17	0	-4	-19%	10	143%
Arkoma Woodford	14	13	1	-6	-30%	-3	-18%
Utica	12	11	1	-4	-25%	3	33%
Other	375	378	(3)	-18	-5%	38	11%
Drill For							
Oil	1329	1318	11	136	11%	443	50%
Dry Gas	227	231	(4)	(80)	-26%	(128)	-36%
Wet Gas	420	427	(7)	(82)	-16%	(114)	-21%
Thermal	3	3	0	(2)	-40%	(4)	-57%
Trajectory							
Horizontal Oil	731	733	(2)	103	16%	340	87%
Horizontal Gas	434	447	(13)	(105)	-19%	(183)	-30%
Horizontal	1165	1180	(15)	(2)	0%	156	15%
% Horizontal	59%	60%	-1%	1%		2%	

Source: Baker Hughes, Inc, Raymond James Estimates
Includes all trajectories

Company Citations

Company Name	Ticker	Exchange	Currency	Closing Price	RJ Rating	RJ Entity
Baker Hughes, Inc.	BHI	NYSE	$	41.00	3	RJ & Associates
MasterCard, Inc.	MA	NYSE	$	439.85	2	RJ & Associates

Notes: Prices are as of the most recent close on the indicated exchange and may not be in US$. See Disclosure section for rating definitions. Stocks that do not trade on a U.S. national exchange may not be approved for sale in all U.S. states. NC=not covered.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

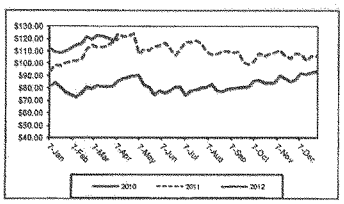
International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Raymond James Weekly Oilfield Review

For Week Ending: 4/5/2012

12 Month Oil Calendar Strip

Brent

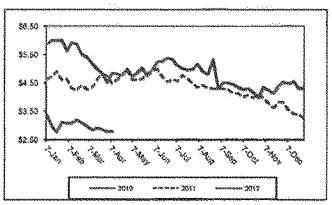


	This Week	Last Week	Beginning of Year	Last Year
Price	$119.74	$118.92	$111.60	$124.02
Percent Change		0.7%	7.3%	-3.5%

Source: Bloomberg

12 Month Gas Calendar Strip

Henry Hub



	This Week	Last Week	Beginning of Year	Last Year
Price	$2.78	$2.80	$3.38	$4.46
Percent Change		-0.8%	-17.7%	-37.8%

Source: Bloomberg

	5-Apr-12 This Week	29-Mar-12 Last Week	7-Apr-11 Last Year	Change From: Last Week	Change From: Last Year
1. U.S.Rig Activity					
U.S. Oil	1,329	1,318	886	0.8%	50.0%
U.S. Gas	647	658	889	-1.7%	-27.2%
U.S. Miscellaneous	3	3	7		
U.S. Total	1,979	1,979	1,782	0.0%	11.1%
U.S. Horizontal	1,165	1,180	1,009	-1.3%	15.5%
U.S. Directional	231	233	230	-0.9%	0.4%
U.S. Offshore	44	46	28	-4.3%	57.1%
U.S. Offshore Gulf of Mexico					
Fleet Size	113	113	125	0.0%	-9.6%
# Contracted	72	72	72	0.0%	0.0%
Utilization	63.7%	63.7%	57.6%	0.0%	10.6%
U.S. Weekly Rig Permits *	1,393	1,240	1,454	12.3%	-4.2%
2. Canadian Activity					
Rig Count	187	255	191	-27.0%	-2.1%
3. Stock Prices (4/5/12)					
OSX	234.5	238.2	292.1	-1.5%	-19.7%
S&P 500	1,398.1	1,408.5	1,328.2	-0.7%	5.3%
DJIA	12,960.0	13,212.0	12,380.1	-1.8%	4.6%
S&P 1500 E&P Index	570.2	581.2	692.8	-1.8%	-17.7%
Alerian MLP Index	397.8	391.9	381.5	1.5%	4.3%
4. Inventories					
U.S. Gas Storage (Bcf)	2,479	2,437	1,579	1.7%	57.0%
Canadian Gas Storage (Bcf)	493	490	195	0.5%	152.2%
Total Petroleum Inventories (000 bbls)	879,893	870,936	889,393	1.0%	-1.1%
5. Spot Prices (US$)					
Oil (W.T.I. Cushing)	$103.31	$103.02	$112.79	0.3%	-8.4%
Oil (Brent)	$123.35	$122.88	$126.85	0.4%	-2.6%
Gas (Henry Hub)	$1.91	$2.00	$4.05	-4.8%	-52.9%
Residual Fuel Oil (New York)	$18.16	$18.24	$17.35	-0.4%	4.6%
Gas (AECO)	$1.75	$1.70	$3.81	2.9%	-54.1%
UK Gas (ICE)	$9.73	$8.65	$9.63	12.5%	1.0%

Sources: Baker Hughes, ODS-Petrodata, API, EIA, Oil Week, Bloomberg

** Note: Weekly rig permits reflect a 1 week lag*

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

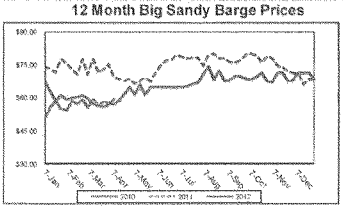
International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

RAYMOND JAMES

Raymond James Weekly Coal Review

For Week Ending: 4/5/2012

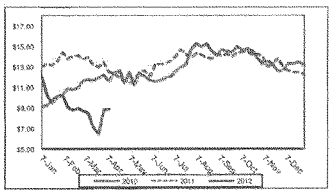
12 Month Big Sandy Barge Prices



	This Week	Last Week	Beginning of Year	Last Year
Price	$59.10	$56.77	$67.50	$75.20
Percent Change		4.1%	-12.4%	-21.4%

Source: Bloomberg

12 Month Powder River Basin 8800 Prices



	This Week	Last Week	Beginning of Year	Last Year
Price	$8.90	$8.85	$12.00	$13.45
Percent Change		0.6%	-25.8%	-33.8%

Source: Bloomberg

	23-Mar-12 This Week	16-Mar-12 Last Week	26-Mar-11 Last Year	Change From Last Week	Change From Last Year
1. Coal Prices					
Eastern U.S.					
CSX 1%	$59.10	$56.77	$75.20	4.1%	-21.4%
Western U.S.					
Powder River 8800	$8.90	$8.85	$13.45	0.6%	-33.8%
2. Production	**23-Mar-12**	**16-Mar-12**	**26-Mar-11**		
Eastern U.S.	8,295	8,153	9,042	1.7%	-8.3%
Western U.S.	10,123	10,645	11,885	-4.9%	-14.8%
Total	18,418	18,798	20,927	-2.0%	-12.0%

Source: Bloomberg

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Important Investor Disclosures

Raymond James & Associates (RJA) is a FINRA member firm and is responsible for the preparation and distribution of research created in the United States. Raymond James & Associates is located at The Raymond James Financial Center, 880 Carillon Parkway, St. Petersburg, FL 33716, (727) 567-1000. Non-U.S. affiliates, which are not FINRA member firms, include the following entities which are responsible for the creation and distribution of research in their respective areas; In Canada, Raymond James Ltd., Suite 2200, 925 West Georgia Street, Vancouver, BC V6C 3L2, (604) 659-8200; In Latin America, Raymond James Latin America, Ruta 8, km 17, 500, 91600 Montevideo, Uruguay, 00598 2 518 2033; In Europe, Raymond James Euro Equities, SAS, 40, rue La Boetie, 75008, Paris, France, +33 1 45 61 64 90.

This document is not directed to, or intended for distribution to or use by, any person or entity that is a citizen or resident of or located in any locality, state, country, or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation. The securities discussed in this document may not be eligible for sale in some jurisdictions. This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. **Investors should consider this report as only a single factor in making their investment decision.**

Investing in securities of issuers organized outside of the U.S., including ADRs, may entail certain risks. The securities of non-U.S. issuers may not be registered with, nor be subject to the reporting requirements of, the U.S. Securities and Exchange Commission. There may be limited information available on such securities. Investors who have received this report may be prohibited in certain states or other jurisdictions from purchasing the securities mentioned in this report. Please ask your Financial Advisor for additional details.

The information provided is as of the date above and subject to change, and it should not be deemed a recommendation to buy or sell any security. Certain information has been obtained from third-party sources we consider reliable, but we do not guarantee that such information is accurate or complete. Persons within the Raymond James family of companies may have information that is not available to the contributors of the information contained in this publication. Raymond James, including affiliates and employees, may execute transactions in the securities listed in this publication that may not be consistent with the ratings appearing in this publication.

Additional information is available on request.

Analyst Information

Registration of Non-U.S. Analysts: The analysts listed on the front of this report who are not employees of Raymond James & Associates, Inc., are not registered/qualified as research analysts under FINRA rules, are not associated persons of Raymond James & Associates, Inc., and are not subject to NASD Rule 2711 and NYSE Rule 472 restrictions on communications with covered companies, public companies, and trading securities held by a research analyst account.

Analyst Holdings and Compensation: Equity analysts and their staffs at Raymond James are compensated based on a salary and bonus system. Several factors enter into the bonus determination including quality and performance of research product, the analyst's success in rating stocks versus an industry index, and support effectiveness to trading and the retail and institutional sales forces. Other factors may include but are not limited to: overall ratings from internal (other than investment banking) or external parties and the general productivity and revenue generated in covered stocks.

The views expressed in this report accurately reflect the personal views of the analyst(s) covering the subject securities. No part of said person's compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in this research report. In addition, said analyst has not received compensation from any subject company in the last 12 months.

Ratings and Definitions

Raymond James & Associates (U.S.) definitions

Strong Buy (SB1) Expected to appreciate, produce a total return of at least 15%, and outperform the S&P 500 over the next six to 12 months. For higher yielding and more conservative equities, such as REITs and certain MLPs, a total return of at least 15% is expected to be realized over the next 12 months.

Outperform (MO2) Expected to appreciate and outperform the S&P 500 over the next 12-18 months. For higher yielding and more conservative equities, such as REITs and certain MLPs, an Outperform rating is used for securities where we are comfortable with the relative safety of the dividend and expect a total return modestly exceeding the dividend yield over the next 12-18 months.

Market Perform (MP3) Expected to perform generally in line with the S&P 500 over the next 12 months.

Underperform (MU4) Expected to underperform the S&P 500 or its sector over the next six to 12 months and should be sold.

Suspended (S) The rating and price target have been suspended temporarily. This action may be due to market events that made coverage impracticable, or to comply with applicable regulations or firm policies in certain circumstances, including when Raymond James may be providing investment banking services to the company. The previous rating and price target are no longer in effect for this security and should not be relied upon.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Raymond James Ltd. (Canada) definitions

Strong Buy (SB1) The stock is expected to appreciate and produce a total return of at least 15% and outperform the S&P/TSX Composite Index over the next six months.
Outperform (MO2) The stock is expected to appreciate and outperform the S&P/TSX Composite Index over the next twelve months.
Market Perform (MP3) The stock is expected to perform generally in line with the S&P/TSX Composite Index over the next twelve months and is potentially a source of funds for more highly rated securities.
Underperform (MU4) The stock is expected to underperform the S&P/TSX Composite Index or its sector over the next six to twelve months and should be sold.

Raymond James Latin American rating definitions

Strong Buy (SB1) Expected to appreciate and produce a total return of at least 25.0% over the next twelve months.
Outperform (MO2) Expected to appreciate and produce a total return of between 15.0% and 25.0% over the next twelve months.
Market Perform (MP3) Expected to perform in line with the underlying country index.
Underperform (MU4) Expected to underperform the underlying country index.
Suspended (S) The rating and price target have been suspended temporarily. This action may be due to market events that made coverage impracticable, or to comply with applicable regulations or firm policies in certain circumstances, including when Raymond James may be providing investment banking services to the company. The previous rating and price target are no longer in effect for this security and should not be relied upon.

Raymond James Euro Equities, SAS rating definitions

Strong Buy (1) Expected to appreciate, produce a total return of at least 15%, and outperform the Stoxx 600 over the next 6 to 12 months.
Outperform (2) Expected to appreciate and outperform the Stoxx 600 over the next 12 months.
Market Perform (3) Expected to perform generally in line with the Stoxx 600 over the next 12 months.
Underperform (4) Expected to underperform the Stoxx 600 or its sector over the next 6 to 12 months.
Suspended (S) The rating and target price have been suspended temporarily. This action may be due to market events that made coverage impracticable, or to comply with applicable regulations or firm policies in certain circumstances, including when Raymond James may be providing investment banking services to the company. The previous rating and target price are no longer in effect for this security and should not be relied upon.

In transacting in any security, investors should be aware that other securities in the Raymond James research coverage universe might carry a higher or lower rating. Investors should feel free to contact their Financial Advisor to discuss the merits of other available investments.

Rating Distributions

	Coverage Universe Rating Distribution			Investment Banking Distribution		
	RJA	RJL	RJ LatAm	RJA	RJL	RJ LatAm
Strong Buy and Outperform (Buy)	56%	69%	36%	14%	39%	14%
Market Perform (Hold)	37%	30%	54%	6%	28%	0%
Underperform (Sell)	7%	1%	10%	1%	0%	0%

Suitability Categories (SR)

For stocks rated by Raymond James & Associates only, the following Suitability Categories provide an assessment of potential risk factors for investors. Suitability ratings are not assigned to stocks rated Underperform (Sell). Projected 12-month price targets are assigned only to stocks rated Strong Buy or Outperform.

Total Return (TR) Lower risk equities possessing dividend yields above that of the S&P 500 and greater stability of principal.

Growth (G) Low to average risk equities with sound financials, more consistent earnings growth, possibly a small dividend, and the potential for long-term price appreciation.

Aggressive Growth (AG) Medium or higher risk equities of companies in fast growing and competitive industries, with less predictable earnings and acceptable, but possibly more leveraged balance sheets.

High Risk (HR) Companies with less predictable earnings (or losses), rapidly changing market dynamics, financial and competitive issues, higher price volatility (beta), and risk of principal.

Venture Risk (VR) Companies with a short or unprofitable operating history, limited or less predictable revenues, very high risk associated with success, and a substantial risk of principal.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Raymond James Relationship Disclosures

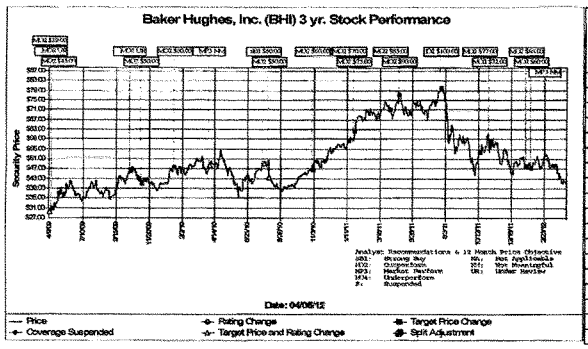
Raymond James expects to receive or intends to seek compensation for investment banking services from the subject companies in the next three months.

Company Name	Disclosure
Baker Hughes, Inc.	Raymond James & Associates received non-investment banking securities-related compensation from BHI within the past 12 months.

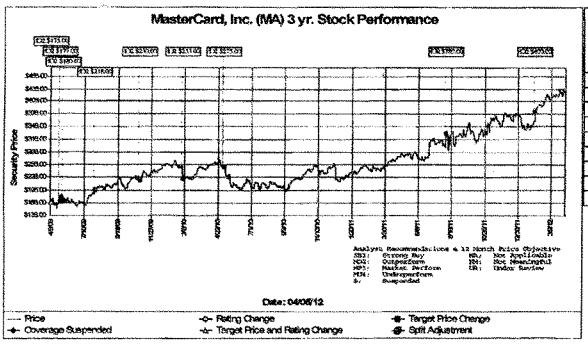
Stock Charts, Target Prices, and Valuation Methodologies

Valuation Methodology: The Raymond James methodology for assigning ratings and target prices includes a number of qualitative and quantitative factors including an assessment of industry size, structure, business trends and overall attractiveness; management effectiveness; competition; visibility; financial condition, and expected total return, among other factors. These factors are subject to change depending on overall economic conditions or industry- or company-specific occurrences. Only stocks rated Strong Buy (SB1) or Outperform (MO2) have target prices and thus valuation methodologies.

Target Prices: The information below indicates target price and rating changes for the subject companies included in this research.



Update Date	Closing Price	Target Price	Rating
2/27/12	51.96	NM	3
1/25/12	47.44	60.00	2
1/17/12	48.02	68.00	2
11/2/11	57.99	72.00	2
10/13/11	53.48	77.00	2
7/26/11	79.94	100.00	2
4/28/11	77.28	90.00	2
4/8/11	71.22	85.00	2
1/26/11	62.32	75.00	2
1/14/11	58.46	70.00	2
11/2/10	46.37	60.00	2
8/4/10	43.66	50.00	2
7/26/10	49.07	60.00	1
4/5/10	48.33	NM	3
1/19/10	47.28	60.00	2
11/5/09	40.89	50.00	2
10/15/09	46.21	UR	2
4/30/09	36.95	45.00	2



Update Date	Closing Price	Target Price	Rating
2/2/12	381.57	400.00	2
8/3/11	330.46	380.00	2
5/4/10	250.83	275.00	2
2/4/10	222.11	233.00	2
11/3/09	219.20	230.00	2
7/30/09	197.62	218.00	2
5/13/09	170.76	180.00	2
5/1/09	170.03	177.00	2
4/9/09	167.33	175.00	2

Valuation Methodology: We value shares of MasterCard on a relative P/E basis to the transaction processing industry. Historically, the transaction processing universe has traded within 15-25x current year's EPS P/E envelope for 15% EPS growth and 10% revenue expansion.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Risk Factors

General Risk Factors: Following are some general risk factors that pertain to the projected target prices included on Raymond James research: (1) Industry fundamentals with respect to customer demand or product / service pricing could change and adversely impact expected revenues and earnings; (2) Issues relating to major competitors or market shares or new product expectations could change investor attitudes toward the sector or this stock; (3) Unforeseen developments with respect to the management, financial condition or accounting policies or practices could alter the prospective valuation; or (4) External factors that affect the U.S. economy, interest rates, the U.S. dollar or major segments of the economy could alter investor confidence and investment prospects. International investments involve additional risks such as currency fluctuations, differing financial accounting standards, and possible political and economic instability.

Specific Investment Risks Related to the Industry or Issuer

Company-Specific Risks for MasterCard, Inc.

Interchange Fees
Interchange fees are subject to increasing regulatory scrutiny worldwide, and retailers are seeking to reduce interchange through litigation. If issuers collect lower interchange fees, they may be less willing to participate in the MasterCard network or may charge higher fees to consumers to recoup the cost. Either scenario could lead to lower transaction volume and financial results for MasterCard.

Litigation
MasterCard is currently the defendant in several lawsuits, including antitrust damage claims from American Express and Discover and relating to MasterCard's currency conversion practices. An adverse judgment in either of these or other lawsuits could negatively affect MasterCard's financial results and position.

Government Regulation
MasterCard is subject to increasing global regulation, including anti-money laundering requirements by the USA PATRIOT Act and the Office of Foreign Assets Control (OFAC) and prohibition on certain types of Internet gambling payments. These regulations may make MasterCard's business more difficult and/or less profitable.

Competitive Pressure
MasterCard faces competitors that are larger and may have access to greater financial resources, primarily Visa. In order to remain competitive, MasterCard may be required to increase its incentives and discounts to retailers and issuers, lowering financial results.

Consolidation
Over the past several years, financial institutions and, to a lesser extent, retailers have experienced consolidation. In the case of financial institutions, this could lead to a MasterCard client being purchased by a Visa client, with MasterCard losing card accounts and revenue. For both financial institutions and retailers, consolidation means greater scale and potentially greater pricing power, which could harm MasterCard's financial results.

Customer Concentration
MasterCard's five largest clients account over 30% of revenue. No single client accounts for more than 10% of total revenue.

Cross-Border Commerce
MasterCard processes virtually all cross-border transactions using the MasterCard, Maestro, or Cirrus brand names. Any decline in cross-border business or leisure travel could adversely affect MasterCard's financial results.

Dependence on Third Parties
With the exception of the United States and select other countries, most intra-country transactions on MasterCard-branded cards are processed by MasterCard issuers or other third-party processors. Failure of any of these third parties could result in damage to MasterCard's reputations and/or lower financial results.

Debit Guarantor
If a MasterCard issuer or acquirer fails to fund its debit obligations due to technical difficulties, liquidity problems, or insolvency, MasterCard steps in as a guarantor. MasterCard has estimated its potential aggregate gross legal settlement exposure at $24 billion as of December 31, 2008. The company's revolving credit line of $2.5 billion could be used to cover such shortfalls, and MasterCard estimates it could cover the failure of any of its largest customers on a peak day, but concurrent failures could exceed the company's available resources.

Visa By-Laws
In June 2003, Visa enacted a bylaw on its 100 largest debit issuers, levying a fine if those issuers reduced their debit volume by more than 10%. While this rule has since been repealed, it may be reinstated, which could limit MasterCard's ability to gain new business from current Visa clients.

Foreign Currency
MasterCard generates roughly half of its revenue outside the United States. Adverse currency fluctuations could negatively impact the company's financial results.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Additional Risk and Disclosure information, as well as more information on the Raymond James rating system and suitability categories, is available at ricapitalmarkets.com/SearchForDisclosures_main.asp. Copies of research or Raymond James' summary policies relating to research analyst independence can be obtained by contacting any Raymond James & Associates or Raymond James Financial Services office (please see raymondjames.com for office locations) or by calling 727-567-1000, toll free 800-237-5643 or sending a written request to the Equity Research Library, Raymond James & Associates, Inc., Tower 3, 6th Floor, 880 Carillon Parkway, St. Petersburg, FL 33716.

For clients in the United Kingdom:

For clients of Raymond James & Associates (London Branch) and Raymond James Financial International Limited (RJFI): This document and any investment to which this document relates is intended for the sole use of the persons to whom it is addressed, being persons who are Eligible Counterparties or Professional Clients as described in the FSA rules or persons described in Articles 19(5) (Investment professionals) or 49(2) (High net worth companies, unincorporated associations etc) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (as amended) or any other person to whom this promotion may lawfully be directed. It is not intended to be distributed or passed on, directly or indirectly, to any other class of persons and may not be relied upon by such persons and is therefore not intended for private individuals or those who would be classified as Retail Clients.

For clients of Raymond James Investment Services, Ltd.: This report is for the use of professional investment advisers and managers and is not intended for use by clients.

For purposes of the Financial Services Authority requirements, this research report is classified as independent with respect to conflict of interest management. RJA, RJFI, and Raymond James Investment Services, Ltd. are authorised and regulated by the Financial Services Authority in the United Kingdom.

For institutional clients in the European Economic Area (EEA) outside of the United Kingdom:

This document (and any attachments or exhibits hereto) is intended only for EEA institutional clients or others to whom it may lawfully be submitted.

For Canadian clients:

Review of Material Operations: The Analyst and/or Associate is required to conduct due diligence on, and where deemed appropriate visit, the material operations of a subject company before initiating research coverage. The scope of the review may vary depending on the complexity of the subject company's business operations.

This report is not prepared subject to Canadian disclosure requirements.

For Latin American clients:

Registration of Brazil-based Analysts: In accordance with Regulation #483 issued by the Brazil Securities and Exchange Commission (CVM) in October 2010, all lead Brazil-based Research Analysts writing and distributing research are CNPI certified as required by Art. 1 of APIMEC's Code of Conduct (www.apimec.com.br/supervisao/codigodeconduta). They abide by the practices and procedures of this regulation as well as internal procedures in place at Raymond James Brasil S.A. A list of research analysts accredited with the APIMEC can be found on the webpage (www.apimec.com.br/ certificacao/Profissionais Certificados).

Non-Brazil-based analysts writing Brazil research and or making sales efforts with the same are released from these APIMEC requirements as stated in Art. 20 of CVM Instruction #483, but abide by recognized Codes of Conduct, Ethics and Practices that comply with Articles 17, 18, and 19 of CVM Instruction #483.

Proprietary Rights Notice: By accepting a copy of this report, you acknowledge and agree as follows:

This report is provided to clients of Raymond James only for your personal, noncommercial use. Except as expressly authorized by Raymond James, you may not copy, reproduce, transmit, sell, display, distribute, publish, broadcast, circulate, modify, disseminate or commercially exploit the information contained in this report, in printed, electronic or any other form, in any manner, without the prior express written consent of Raymond James. You also agree not to use the information provided in this report for any unlawful purpose.

This report and its contents are the property of Raymond James and are protected by applicable copyright, trade secret or other intellectual property laws (of the United States and other countries). United States law, 17 U.S.C. Sec.501 et seq, provides for civil and criminal penalties for copyright infringement.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

EXHIBIT C

RAYMOND JAMES | U.S. Research

Energy

April 2, 2012

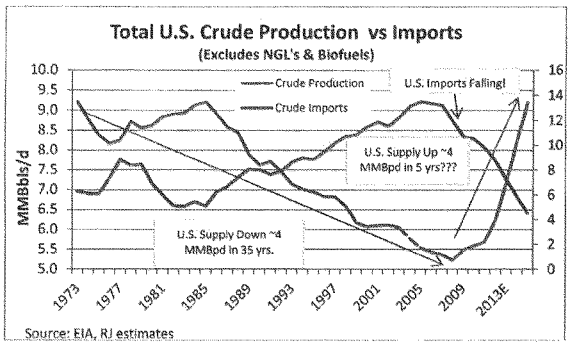
Industry Brief

J. Marshall Adkins, (713) 789-3551, Marshall.Adkins@RaymondJames.com
Pavel Molchanov, (713) 278-5270, Pavel.Molchanov@RaymondJames.com

Energy: Stat of the Week

Yes, Mr. President, We Believe We Can Drill Our Way Out of This Problem

Last week, President Obama once again blamed U.S. oil and gas producers in an effort to deflect public discontent over high gasoline prices. For now, let's ignore the economic assumption that higher taxes on the companies that produce energy will never lower the price of energy. Instead, let's focus on President Obama's "all of the above" plan for energy independence, where he confidently claims that "we cannot drill our way out of this problem." Of course, every president from Nixon to Obama has made these types of high-profile energy independence speeches. Over the past four decades, all of those speeches have long been forgotten and the targets contained within them quietly shelved. Like others before it, this recent speech will ultimately be proven off-base (in a good way) since our math says the **U.S. is already beginning to drill our way out of the problem**. The fact is that U.S. oil and gas companies have already overcome government road blocks (i.e., the EPA) and geological challenges to reverse a nearly four-decade-long decline in oil supply (as shown below).



Couple increasing oil supply with declining U.S. oil demand (for which the government can claim some credit), and the result is a sharp reduction in the nation's oil imports (as shown above). Building on the foundational analysis from our U.S. oil supply model, **today we discuss the major implications of increasing U.S. oil supply and falling U.S. oil demand for the broader economy and most notably the U.S. trade deficit.**

Surging U.S. oil supply has changed the game. Just as U.S. oil demand was peaking in the middle of the past decade, domestic supply (oil plus other liquids) was bottoming, at ~7.0 MMbpd in each of 2005-2008. This followed three and a half decades of nearly continual declines in the lower 48 states. Well, not any more. Over the three-year period 2009-2011, the U.S. contributed more incremental oil supply than **any other country** (OPEC or non-OPEC), reaching 8.1 MMbpd last year. Think about that for a minute. Throughout most of our lifetimes, we have taken it for granted that the U.S. was in the global oil market's "over the hill" club (along with the U.K., Mexico, etc.). That this has changed so quickly – and so dramatically – is a tribute to the ingenuity and skill of the oil industry, both operators and service providers. By opening the door to vast resources of unconventional liquids (and, of course, natural gas too), the industry has radically reshaped the trajectory of U.S. oil production. As we detailed in our Stat on February 13,

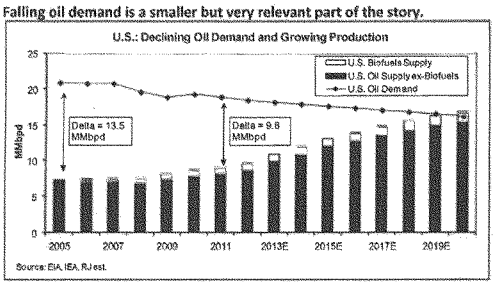
Please read domestic and foreign disclosure/risk information beginning on page 7 and Analyst Certification on page 7.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

after a 3.8% increase in 2011 (which would have been a lot more had it not been for the Gulf of Mexico drilling moratorium), we project growth of 6% in 2012 and an average of 11% per year in the 2013-2015 time frame. This is overwhelmingly driven by the ongoing surge in onshore volumes but also reflects in the recent Gulf declines. Our assumptions for 2016-2020 assume slowing growth as the decade progresses and equate to a 5% annualized rate, which is certainly conservative compared to the next several years. For biofuels, a much smaller variable overall, growth slowed in recent years, reflecting the transition from corn ethanol to advanced biofuels. We project acceleration of growth to 5% annual growth in 2015 and beyond. This is the only element of domestic supply growth that has been spurred to a substantial extent by policy.

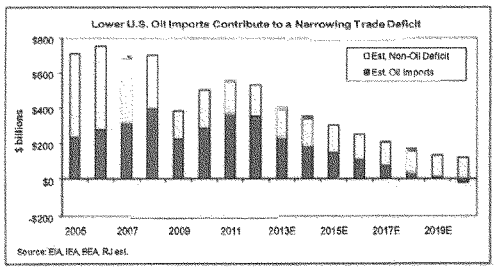
Falling oil demand is a smaller but very relevant part of the story.



Half a century ago, Asian economies like Singapore pioneered the concept of "import substitution" (though, in their case, it didn't involve oil). The recipe is simple: boost domestic production, cut domestic demand, and – voila – imports fall. The U.S. road to oil independence has the same underlying trends. Let's look at demand first. Domestic oil demand peaked in 2005 at 20.8 MMbpd, having **grown** in every year but one since 1992. Since then, however, demand has **fallen** in every year but one – not just in the post-meltdown era, but even in the ostensibly good economic years of 2006-2007. U.S. oil demand has fallen largely because of higher energy prices driving better vehicle efficiency and reduced travel patterns. So, what will U.S. oil demand do over the next decade? After an estimated 2.5% decline this year (2012), we project a base decline of 1.5% each year through 2020. To put our 2.5% decline assumption in context, Energy Information Administration (EIA) data year-to-date 2012 shows demand down a staggering 6% relative to a year ago. We have our doubts about these numbers since it appears about one-third of that fall appears to be the result of a change in how gasoline exports are estimated. Recent MasterCard gasoline sales data, however, confirms a YTD decline in the 4-5% range – still **way** above our 2.5% estimate for full-year 2012.

So, what's the bottom line? The U.S. net oil import requirement reached an all-time high in 2005, 13.5 MMbpd (65% of demand). The net import requirement has dropped every year since then, reaching ~9.8 MMbpd (52%) in 2011. We project further declines to 8.8 MMbpd (48%) in 2012 and 4.5 MMbpd (26%) in 2015. By 2020 – based on the assumptions we previously outlined for domestic oil production, growth in biofuels, and declines in demand – we expect net imports to reach essentially zero. That's right – oil independence. (On a technical note: the net import requirement calculated in our analysis is for crude oil. As a practical matter, some imports have historically come in the form of refined products, though the bulk has been crude. Given the weak domestic demand and excess refining capacity, the U.S. is currently a net exporter of refined products.)

What does all this do to the U.S. trade deficit?



Americans like shopping, and they do it a lot – and it clearly shows in the nation's trade deficit. In addition to the obvious suspects – cheap overseas-made laptops and T-shirts – oil imports play a huge role in the trade deficit. As shown in the adjacent chart, oil imports generated over half of the total deficit every year since 2007. Note that the "non-oil deficit" (i.e., what the deficit would theoretically have been had net oil imports been zero) has dropped precipitously in the aftermath of the recession, but the oil deficit in 2011 was about as wide as in 2008. Put simply, the decline in oil imports (in barrel terms) over the past three years was essentially offset by the higher price per Bbl. (Remember, the price of imported crude is heavily linked to Brent, which had its best year ever in 2011.) Nonetheless, the lower import requirement still "saved" America a lot of money: at ~$100/Bbl Brent, the ~2.2 MMbpd reduction in imports since 2008 equates to ~$80 billion annually – not a trivial sum. As

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

we look ahead to 2020, the price of crude becomes less and less relevant to the trade deficit given our assumption that U.S. net imports will drop to zero by 2020. According to our forecast, the U.S. oil import price tag would fall from ~$371 billion in 2011 to a "goose egg" before the end of the decade.

In addition to lower oil import costs, we think the cheaper domestic natural gas prices should stimulate a resurgence in U.S. manufacturing, especially in energy-intensive sectors such as fertilizer and petrochemicals. Our expectations for low natural gas prices and increased natural gas liquids (NGLs) supply mean that energy-intensive industries in the U.S. should have a substantial cost advantage over just about anyone in the world (especially those using oil-based feedstock). With this in mind, we think it's reasonable to assume a modest decline in the non-oil deficit (at a rate of 5% per year), despite our expectations for a rising dollar. In our model, this decreasing non-oil related trade deficit equates to additional savings of $69 billion by 2020. Altogether, these trends point to a reduction in the total U.S. trade deficit of a whopping 82% by 2020. (On a side note: This analysis does **not** ascribe any credit for the prospect of the U.S. becoming a significant liquefied natural gas (LNG) exporter. While the structural divergence between domestic and overseas gas prices makes LNG exports a lucrative proposition, there is slim visibility on the timetable for developing the infrastructure for these exports to materialize.)

Where could we be proven wrong?

For both of the variables we analyzed – domestic oil demand and domestic oil supply – there are both upside and downside risks, especially looking as far out as 2020. For demand, our bias is to the **downside**. Our long-term assumption of 1.5% annualized declines may well end up being too conservative (in other words, U.S. oil demand will likely fall faster than we are modeling) if alternative energy sources (especially natural gas) end up displacing even more oil consumption than we are expecting. For U.S. oil supply, our bias is to the **upside** relative to our model. Our 2015-2020 assumption of 5% annualized growth in U.S. oil production represents a sharp slowdown from what we anticipate over the next several years. While there is no doubt that field decline rates in most of the new supply sources – deepwater and shale plays – are quite steep, the ongoing trend of (1) increasing drilling activity and (2) improving well productivity suggests that higher growth should be sustainable for more than a decade. Additionally, we are not factoring in any significant new shale plays (such as the Utica) in the model. Other than a sudden collapse in WTI oil prices, the only scenario we can envision where domestic oil volumes would stop growing in the foreseeable future is a federal ban on hydraulic fracturing, massive government-driven infrastructure delays, or other drastic regulatory changes. When it comes to biofuels, our long-term assumption of 5% annualized growth is also likely to be conservative. Given the amount of capital that is being invested in low-cost cellulosic biofuels and other emerging technologies (algae, etc.), alongside the requirements of the federal Renewable Fuels Standard, we think actual growth will be faster. And lastly, we would note that our analysis does not take into account the disconnect between U.S. oil production growth (predominantly light/sweet) and the domestic refining appetite (half of which is geared toward heavy barrels). Thus, domestic production growth would not technically be able to completely displace imports.

Conclusion

After more than three decades of falling oil production in the lower 48 states, the U.S. is now poised to sharply increase domestic oil production and sharply decrease its dependence on imported oil. The consequences of this massive, structural U.S. energy supply shift echo well beyond oil and gas stocks. It means the U.S. is poised to become meaningfully less dependent upon the rest of the world to satisfy our rather large driving appetite. In addition to rising U.S. oil supply, U.S. oil demand now appears to be falling at an unprecedented rate as high prices have encouraged less driving, rising vehicle efficiency, and more natural gas vehicles that reduce demand for imported oil. Combining rising supply and declining demand equates to a substantial ongoing reduction in the U.S. net oil import requirement. Specifically, we are looking for net U.S. oil imports to fall from 13.5 MMbpd (65% of demand) in 2005 and ~9.8 MMbpd (52% of demand) in 2011, to an estimated 4.5 MMbpd (26% of demand) by 2015 and actual oil independence by 2020. The resulting savings from the standpoint of the trade deficit are highly meaningful, especially when the benefits of cheaper energy for domestic manufacturing are taken into account. Maybe the real question is: when will Washington apply to join OPEC?

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

U.S. Rig Count Breakdown

	3/30/2012	3/23/2012	W/W Δ	YTD Δ	YTD % Δ	Y/Y Δ	Y/Y % Δ
Total Count							
U.S. Rig Count	1979	1968	11	(28)	-1%	203	11%
By Basin*							
Permian	476	469	7	21	5%	96	25%
Eagle Ford	257	258	(1)	21	9%	101	65%
Bakken	217	212	5	25	13%	49	29%
Marcellus	125	123	2	-13	-9%	8	7%
Haynesville	74	75	(1)	-40	-35%	-82	-53%
Granite Wash	73	66	7	2	3%	-7	-9%
Mississippi Lime	60	62	(2)	12	25%	35	140%
Cana Woodford	55	59	(4)	-3	-5%	-4	-7%
Barnett	55	54	1	-4	-7%	-25	-31%
DJ Basin	38	39	(1)	-4	-10%	0	0%
San Joaquin Basin	35	35	0	3	9%	8	30%
Uinta	34	33	1	4	13%	9	36%
Piceance Basin	21	22	(1)	-6	-22%	-9	-30%
Fayetteville	20	21	(1)	-6	-23%	-8	-29%
Pinedale	20	19	1	-9	-31%	-7	-26%
Powder River Basin	17	17	0	-4	-19%	10	143%
Arkoma Woodford	13	13	0	-7	-35%	-6	-32%
Utica	11	11	0	-5	-31%	3	38%
Other	378	380	(2)	-15	-4%	32	9%
Drill For							
Oil	1318	1313	5	125	10%	441	50%
Dry Gas	235	233	2	(54)	-19%	(83)	-26%
Wet Gas	423	419	4	(97)	-19%	(150)	-26%
Thermal	3	3	0	(2)	-40%	(5)	-63%
Trajectory							
Horizontal Oil	733	732	1	105	17%	335	84%
Horizontal Gas	447	442	5	(92)	-17%	(171)	-28%
Horizontal	1180	1174	6	13	1%	163	16%
% Horizontal	60%	60%	0%	1%		2%	

Source: Baker Hughes, Inc, Raymond James Estimates
Includes all trajectories

Company Citations

Company Name	Ticker	Exchange	Currency	Closing Price	RJ Rating	RJ Entity
MasterCard, Inc.	MA	NYSE	$	420.54	2	RJ & Associates

Notes: Prices are as of the most recent close on the indicated exchange and may not be in US$. See Disclosure section for rating definitions. Stocks that do not trade on a U.S. national exchange may not be approved for sale in all U.S. states. NC=not covered.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

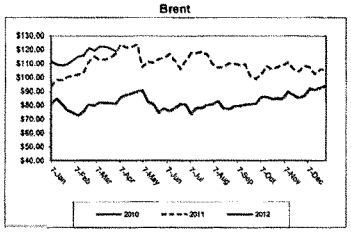
International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Raymond James Weekly Oilfield Review

For Week Ending: 3/30/2012

12 Month Oil Calendar Strip

Brent

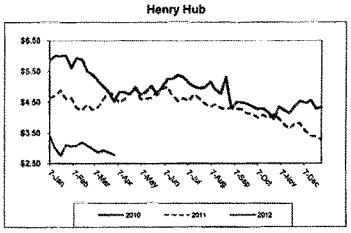


	This Week	Last Week	Beginning of Year	Last Year
Price	$119.03	$121.21	$111.60	$116.97
Percent Change		-1.8%	6.7%	1.8%

Source: Bloomberg

12 Month Gas Calendar Strip

Henry Hub



	This Week	Last Week	Beginning of Year	Last Year
Price	$2.79	$2.86	$3.38	$4.72
Percent Change		-2.4%	-17.4%	-40.9%

Source: Bloomberg

	30-Mar-12 This Week	23-Mar-12 Last Week	1-Apr-11 Last Year	Change From: Last Week	Change From: Last Year
1. U.S.Rig Activity					
U.S. Oil	1,318	1,313	877	0.4%	50.3%
U.S. Gas	658	652	891	0.9%	-26.2%
U.S. Miscellaneous	3	3	8		
U.S. Total	1,979	1,968	1,776	0.6%	11.4%
U.S. Horizontal	1.180	1,174	1,017	0.5%	16.0%
U.S. Directional	233	231	228	0.9%	2.2%
U.S. Offshore	46	46	27	0.0%	70.4%
U.S. Offshore Gulf of Mexico					
Fleet Size	113	115	124	-1.7%	-8.9%
# Contracted	72	74	70	-2.7%	2.9%
Utilization	63.7%	64.3%	56.5%	-0.9%	12.7%
U.S. Weekly Rig Permits *	1,240	1,318	1,368	-5.9%	-9.4%
2. Canadian Activity					
Rig Count	566	352	285	60.8%	98.6%
3. Stock Prices (3/30/12)					
OSX	238.2	241.5	296.1	-1.4%	-19.6%
S&P 500	1,408.5	1,397.1	1,332.4	0.8%	5.7%
DJIA	13,212.0	13,080.7	12,376.7	1.0%	6.7%
S&P 1500 E&P Index	581.2	590.3	696.0	-1.5%	-16.5%
Alerian MLP Index	391.9	396.9	381.4	-1.3%	2.8%
4. Inventories					
U.S. Gas Storage (Bcf)	2,437	2,380	1,624	2.4%	50.1%
Canadian Gas Storage (Bcf)	490	481	200	2.0%	144.5%
Total Petroleum Inventories ('000 bbls)	870,938	868,313	888,273	0.3%	-2.0%
5. Spot Prices (US$)					
Oil (W.T.I. Cushing)	$103.02	$108.47	$107.94	-3.2%	-4.6%
Oil (Brent)	$123.00	$125.13	$118.70	-1.7%	3.6%
Gas (Henry Hub)	$2.00	$2.07	$4.32	-3.3%	-53.6%
Residual Fuel Oil (New York)	$18.24	$18.32	$16.57	-0.4%	10.1%
Gas (AECO)	$1.68	$1.87	$3.89	-11.2%	-57.3%
UK Gas (ICE)	$7.97	$9.45	$9.68	-15.6%	-17.6%

Sources: Baker Hughes, ODS-Petrodata, API, EIA, Oil Week, Bloomberg

** Note: Weekly rig permits reflect a 1 week lag*

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

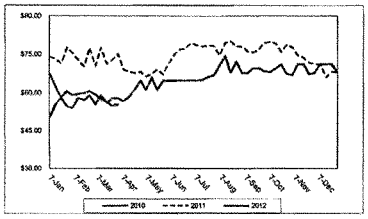
International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

RAYMOND JAMES

Raymond James Weekly Coal Review

For Week Ending: 3/30/2012

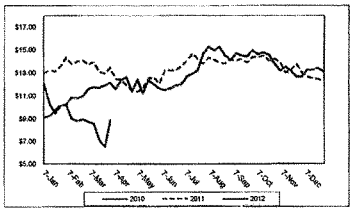
12 Month Big Sandy Barge Prices



	This Week	Last Week	Beginning of Year	Last Year
Price	$55.50	$55.00	$67.50	$72.75
Percent Change		0.9%	-17.8%	-23.7%

Source: Bloomberg

12 Month Powder River Basin 8800 Prices



	This Week	Last Week	Beginning of Year	Last Year
Price	$8.85	$6.50	$12.00	$12.95
Percent Change		36.2%	-26.3%	-31.7%

Source: Bloomberg

	30-Mar-12 This Week	23-Mar-12 Last Week	1-Apr-11 Last Year	Change From: Last Week	Change From: Last Year
1. Coal Prices					
Eastern U.S.					
CSX 1%	$55.50	$55.00	$72.75	0.9%	-23.7%
Western U.S.					
Powder River 8800	$8.85	$6.50	$12.95	36.2%	-31.7%
2. Production	**23-Mar-12**	**16-Mar-12**	**25-Mar-11**		
Eastern U.S.	8,295	8,153	9,042	1.7%	-8.3%
Western U.S.	10,123	10,645	11,885	-4.9%	-14.8%
Total	18,418	18,798	20,927	-2.0%	-12.0%

Source: Bloomberg

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

RAYMOND JAMES

Important Investor Disclosures

Raymond James & Associates (RJA) is a FINRA member firm and is responsible for the preparation and distribution of research created in the United States. Raymond James & Associates is located at The Raymond James Financial Center, 880 Carillon Parkway, St. Petersburg, FL 33716, (727) 567-1000. Non-U.S. affiliates, which are not FINRA member firms, include the following entities which are responsible for the creation and distribution of research in their respective areas; In Canada, Raymond James Ltd., Suite 2200, 925 West Georgia Street, Vancouver, BC V6C 3L2, (604) 659-8200; In Latin America, Raymond James Latin America, Ruta 8, km 17, 500, 91600 Montevideo, Uruguay, 00598 2 518 2033; In Europe, Raymond James European Equities, 40, rue La Boetie, 75008, Paris, France, +33 1 45 61 64 90.

This document is not directed to, or intended for distribution to or use by, any person or entity that is a citizen or resident of or located in any locality, state, country, or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation. The securities discussed in this document may not be eligible for sale in some jurisdictions. This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. **Investors should consider this report as only a single factor in making their investment decision.**

Investing in securities of issuers organized outside of the U.S., including ADRs, may entail certain risks. The securities of non-U.S. issuers may not be registered with, nor be subject to the reporting requirements of, the U.S. Securities and Exchange Commission. There may be limited information available on such securities. Investors who have received this report may be prohibited in certain states or other jurisdictions from purchasing the securities mentioned in this report. Please ask your Financial Advisor for additional details.

The information provided is as of the date above and subject to change, and it should not be deemed a recommendation to buy or sell any security. Certain information has been obtained from third-party sources we consider reliable, but we do not guarantee that such information is accurate or complete. Persons within the Raymond James family of companies may have information that is not available to the contributors of the information contained in this publication. Raymond James, including affiliates and employees, may execute transactions in the securities listed in this publication that may not be consistent with the ratings appearing in this publication.

Additional information is available on request.

Analyst Information

Registration of Non-U.S. Analysts: The analysts listed on the front of this report who are not employees of Raymond James & Associates, Inc., are not registered/qualified as research analysts under FINRA rules, are not associated persons of Raymond James & Associates, Inc., and are not subject to NASD Rule 2711 and NYSE Rule 472 restrictions on communications with covered companies, public companies, and trading securities held by a research analyst account.

Analyst Holdings and Compensation: Equity analysts and their staffs at Raymond James are compensated based on a salary and bonus system. Several factors enter into the bonus determination including quality and performance of research product, the analyst's success in rating stocks versus an industry index, and support effectiveness to trading and the retail and institutional sales forces. Other factors may include but are not limited to: overall ratings from internal (other than investment banking) or external parties and the general productivity and revenue generated in covered stocks.

The views expressed in this report accurately reflect the personal views of the analyst(s) covering the subject securities. No part of said person's compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in this research report. In addition, said analyst has not received compensation from any subject company in the last 12 months.

Ratings and Definitions

Raymond James & Associates (U.S.) definitions

Strong Buy (SB1) Expected to appreciate, produce a total return of at least 15%, and outperform the S&P 500 over the next six to 12 months. For higher yielding and more conservative equities, such as REITs and certain MLPs, a total return of at least 15% is expected to be realized over the next 12 months.

Outperform (MO2) Expected to appreciate and outperform the S&P 500 over the next 12-18 months. For higher yielding and more conservative equities, such as REITs and certain MLPs, an Outperform rating is used for securities where we are comfortable with the relative safety of the dividend and expect a total return modestly exceeding the dividend yield over the next 12-18 months.

Market Perform (MP3) Expected to perform generally in line with the S&P 500 over the next 12 months.

Underperform (MU4) Expected to underperform the S&P 500 or its sector over the next six to 12 months and should be sold.

Suspended (S) The rating and price target have been suspended temporarily. This action may be due to market events that made coverage impracticable, or to comply with applicable regulations or firm policies in certain circumstances, including when Raymond James may be providing investment banking services to the company. The previous rating and price target are no longer in effect for this security and should not be relied upon.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Raymond James Ltd. (Canada) definitions

Strong Buy (SB1) The stock is expected to appreciate and produce a total return of at least 15% and outperform the S&P/TSX Composite Index over the next six months.
Outperform (MO2) The stock is expected to appreciate and outperform the S&P/TSX Composite Index over the next twelve months.
Market Perform (MP3) The stock is expected to perform generally in line with the S&P/TSX Composite Index over the next twelve months and is potentially a source of funds for more highly rated securities.
Underperform (MU4) The stock is expected to underperform the S&P/TSX Composite Index or its sector over the next six to twelve months and should be sold.

Raymond James Latin American rating definitions

Strong Buy (SB1) Expected to appreciate and produce a total return of at least 25.0% over the next twelve months.
Outperform (MO2) Expected to appreciate and produce a total return of between 15.0% and 25.0% over the next twelve months.
Market Perform (MP3) Expected to perform in line with the underlying country index.
Underperform (MU4) Expected to underperform the underlying country index.
Suspended (S) The rating and price target have been suspended temporarily. This action may be due to market events that made coverage impracticable, or to comply with applicable regulations or firm policies in certain circumstances, including when Raymond James may be providing investment banking services to the company. The previous rating and price target are no longer in effect for this security and should not be relied upon.

Raymond James European Equities rating definitions

Strong Buy (1) Expected to appreciate, produce a total return of at least 15%, and outperform the Stoxx 600 over the next 6 to 12 months.
Outperform (2) Expected to appreciate and outperform the Stoxx 600 over the next 12 months.
Market Perform (3) Expected to perform generally in line with the Stoxx 600 over the next 12 months.
Underperform (4) Expected to underperform the Stoxx 600 or its sector over the next 6 to 12 months.

In transacting in any security, investors should be aware that other securities in the Raymond James research coverage universe might carry a higher or lower rating. Investors should feel free to contact their Financial Advisor to discuss the merits of other available investments.

Rating Distributions

	Coverage Universe Rating Distribution			Investment Banking Distribution		
	RJA	RJL	RJ LatAm	RJA	RJL	RJ LatAm
Strong Buy and Outperform (Buy)	56%	68%	37%	13%	40%	14%
Market Perform (Hold)	37%	31%	53%	6%	27%	0%
Underperform (Sell)	7%	1%	10%	2%	0%	0%

Suitability Categories (SR)

For stocks rated by Raymond James & Associates only, the following Suitability Categories provide an assessment of potential risk factors for investors. Suitability ratings are not assigned to stocks rated Underperform (Sell). Projected 12-month price targets are assigned only to stocks rated Strong Buy or Outperform.

Total Return (TR) Lower risk equities possessing dividend yields above that of the S&P 500 and greater stability of principal.

Growth (G) Low to average risk equities with sound financials, more consistent earnings growth, possibly a small dividend, and the potential for long-term price appreciation.

Aggressive Growth (AG) Medium or higher risk equities of companies in fast growing and competitive industries, with less predictable earnings and acceptable, but possibly more leveraged balance sheets.

High Risk (HR) Companies with less predictable earnings (or losses), rapidly changing market dynamics, financial and competitive issues, higher price volatility (beta), and risk of principal.

Venture Risk (VR) Companies with a short or unprofitable operating history, limited or less predictable revenues, very high risk associated with success, and a substantial risk of principal.

Raymond James Relationship Disclosures

Raymond James expects to receive or intends to seek compensation for investment banking services from the subject companies in the next three months.

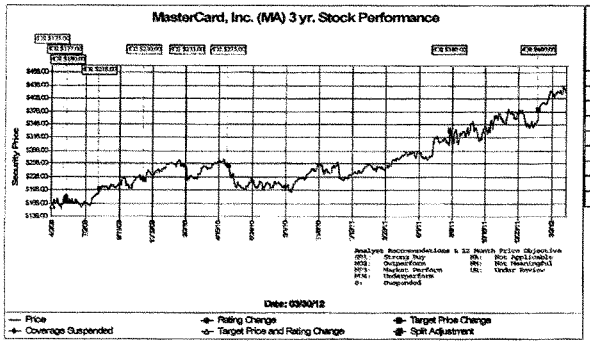
Stock Charts, Target Prices, and Valuation Methodologies

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Valuation Methodology: The Raymond James methodology for assigning ratings and target prices includes a number of qualitative and quantitative factors including an assessment of industry size, structure, business trends and overall attractiveness; management effectiveness; competition; visibility; financial condition, and expected total return, among other factors. These factors are subject to change depending on overall economic conditions or industry- or company-specific occurrences. Only stocks rated Strong Buy (SB1) or Outperform (MO2) have target prices and thus valuation methodologies.

Target Prices: The information below indicates target price and rating changes for the subject companies included in this research.



Update Date	Closing Price	Target Price	Rating
2/2/12	381.57	400.00	2
8/3/11	330.46	380.00	2
5/4/10	250.83	275.00	2
2/4/10	222.11	233.00	2
11/3/09	219.20	230.00	2
7/30/09	197.62	218.00	2
5/13/09	170.76	180.00	2
5/1/09	170.03	177.00	2
4/2/09	160.08	175.00	2

Valuation Methodology: We value shares of MasterCard on a relative P/E basis to the transaction processing industry. Historically, the transaction processing universe has traded within 15-25x current year's EPS P/E envelope for 15% EPS growth and 10% revenue expansion.

Risk Factors

General Risk Factors: Following are some general risk factors that pertain to the projected target prices included on Raymond James research: (1) Industry fundamentals with respect to customer demand or product / service pricing could change and adversely impact expected revenues and earnings; (2) Issues relating to major competitors or market shares or new product expectations could change investor attitudes toward the sector or this stock; (3) Unforeseen developments with respect to the management, financial condition or accounting policies or practices could alter the prospective valuation; or (4) External factors that affect the U.S. economy, interest rates, the U.S. dollar or major segments of the economy could alter investor confidence and investment prospects. International investments involve additional risks such as currency fluctuations, differing financial accounting standards, and possible political and economic instability.

Specific Investment Risks Related to the Industry or Issuer

Company-Specific Risks for MasterCard, Inc.

Interchange Fees
Interchange fees are subject to increasing regulatory scrutiny worldwide, and retailers are seeking to reduce interchange through litigation. If issuers collect lower interchange fees, they may be less willing to participate in the MasterCard network or may charge higher fees to consumers to recoup the cost. Either scenario could lead to lower transaction volume and financial results for MasterCard.

Litigation
MasterCard is currently the defendant in several lawsuits, including antitrust damage claims from American Express and Discover and relating to MasterCard's currency conversion practices. An adverse judgment in either of these or other lawsuits could negatively affect MasterCard's financial results and position.

Government Regulation
MasterCard is subject to increasing global regulation, including anti-money laundering requirements by the USA PATRIOT Act and the Office of Foreign Assets Control (OFAC) and prohibition on certain types of Internet gambling payments. These regulations may make MasterCard's business more difficult and/or less profitable.

Competitive Pressure

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

MasterCard faces competitors that are larger and may have access to greater financial resources, primarily Visa. In order to remain competitive, MasterCard may be required to increase its incentives and discounts to retailers and issuers, lowering financial results.

Consolidation
Over the past several years, financial institutions and, to a lesser extent, retailers have experienced consolidation. In the case of financial institutions, this could lead to a MasterCard client being purchased by a Visa client, with MasterCard losing card accounts and revenue. For both financial institutions and retailers, consolidation means greater scale and potentially greater pricing power, which could harm MasterCard's financial results.

Customer Concentration
MasterCard's five largest clients account over 30% of revenue. No single client accounts for more than 10% of total revenue.

Cross-Border Commerce
MasterCard processes virtually all cross-border transactions using the MasterCard, Maestro, or Cirrus brand names. Any decline in cross-border business or leisure travel could adversely affect MasterCard's financial results.

Dependence on Third Parties
With the exception of the United States and select other countries, most intra-country transactions on MasterCard-branded cards are processed by MasterCard issuers or other third-party processors. Failure of any of these third parties could result in damage to MasterCard's reputations and/or lower financial results.

Debit Guarantor
If a MasterCard issuer or acquirer fails to fund its debit obligations due to technical difficulties, liquidity problems, or insolvency, MasterCard steps in as a guarantor. MasterCard has estimated its potential aggregate gross legal settlement exposure at $24 billion as of December 31, 2008. The company's revolving credit line of $2.5 billion could be used to cover such shortfalls, and MasterCard estimates it could cover the failure of any of its largest customers on a peak day, but concurrent failures could exceed the company's available resources.

Visa By-Laws
In June 2003, Visa enacted a bylaw on its 100 largest debit issuers, levying a fine if those issuers reduced their debit volume by more than 10%. While this rule has since been repealed, it may be reinstated, which could limit MasterCard's ability to gain new business from current Visa clients.

Foreign Currency
MasterCard generates roughly half of its revenue outside the United States. Adverse currency fluctuations could negatively impact the company's financial results.

Additional Risk and Disclosure information, as well as more information on the Raymond James rating system and suitability categories, is available at rjcapitalmarkets.com/SearchForDisclosures_main.asp. Copies of research or Raymond James' summary policies relating to research analyst independence can be obtained by contacting any Raymond James & Associates or Raymond James Financial Services office (please see raymondjames.com for office locations) or by calling 727-567-1000, toll free 800-237-5643 or sending a written request to the Equity Research Library, Raymond James & Associates, Inc., Tower 3, 6th Floor, 880 Carillon Parkway, St. Petersburg, FL 33716.

For clients in the United Kingdom:

For clients of Raymond James & Associates (RJA) and Raymond James Financial International, Ltd. (RJFI): This report is for distribution only to persons who fall within Articles 19 or Article 49(2) of the Financial Services and Markets Act (Financial Promotion) Order 2000 as investment professionals and may not be distributed to, or relied upon, by any other person.

For clients of Raymond James Investment Services, Ltd.: This report is intended only for clients in receipt of Raymond James Investment Services, Ltd.'s Terms of Business or others to whom it may be lawfully submitted.

For purposes of the Financial Services Authority requirements, this research report is classified as objective with respect to conflict of interest management. RJA, Raymond James Financial International, Ltd., and Raymond James Investment Services, Ltd. are authorized and regulated in the U.K. by the Financial Services Authority.

For institutional clients in the European Economic Area (EEA) outside of the United Kingdom:

This document (and any attachments or exhibits hereto) is intended only for EEA institutional clients or others to whom it may lawfully be submitted.

For Canadian clients:

Review of Material Operations: The Analyst and/or Associate is required to conduct due diligence on, and where deemed appropriate visit, the material operations of a subject company before initiating research coverage. The scope of the review may vary depending on the complexity of the subject company's business operations.

This report is not prepared subject to Canadian disclosure requirements.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

For Latin American clients:

Registration of Brazil-based Analysts: In accordance with Regulation #483 issued by the Brazil Securities and Exchange Commission (CVM) in October 2010, all lead Brazil-based Research Analysts writing and distributing research are CNPI certified as required by Art. 1 of APIMEC's Code of Conduct (www.apimec.com.br/supervisao/codigodeconduta). They abide by the practices and procedures of this regulation as well as internal procedures in place at Raymond James Brasil S.A. A list of research analysts accredited with the APIMEC can be found on the webpage (www.apimec.com.br/ certificacao/Profissionais Certificados).

Non-Brazil-based analysts writing Brazil research and or making sales efforts with the same are released from these APIMEC requirements as stated in Art. 20 of CVM Instruction #483, but abide by recognized Codes of Conduct, Ethics and Practices that comply with Articles 17, 18, and 19 of CVM Instruction #483.

Proprietary Rights Notice: By accepting a copy of this report, you acknowledge and agree as follows:

This report is provided to clients of Raymond James only for your personal, noncommercial use. Except as expressly authorized by Raymond James, you may not copy, reproduce, transmit, sell, display, distribute, publish, broadcast, circulate, modify, disseminate or commercially exploit the information contained in this report, in printed, electronic or any other form, in any manner, without the prior express written consent of Raymond James. You also agree not to use the information provided in this report for any unlawful purpose.

This report and its contents are the property of Raymond James and are protected by applicable copyright, trade secret or other intellectual property laws (of the United States and other countries). United States law, 17 U.S.C. Sec.501 et seq, provides for civil and criminal penalties for copyright infringement.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

EXHIBIT D

RAYMOND JAMES | U.S. Research

Energy

February 13, 2012

Industry Brief

J. Marshall Adkins, (713) 789-3551, Marshall.Adkins@RaymondJames.com
John Freeman, CFA, (713) 278-5251, John.Freeman@RaymondJames.com
Stacey Hudson, Res. Assoc., (713) 278-5258, Stacey.Hudson@RaymondJames.com
Vanessa Howell, Res. Assoc., (713) 278-5291, Vanessa.Howell@RaymondJames.com

Energy: Stat of the Week

U.S. Oil Production Catapulting Up and to the Right; Chopping 2013+ Oil Deck

Just a few short years ago, everyone was looking to big deepwater plays in Brazil and West Africa for non-OPEC oil supply growth. Well, leave the row-boat in the shed because the true near-term driver for non-OPEC oil supply is now right in your back yard. After decades of steady declines, U.S. oil production has made an abrupt about-face that is driving the resurgence in non-OPEC supply. After conducting a detailed, proprietary, bottoms-up analysis on play-by-play oil production from the major onshore U.S. liquids plays, we now expect the current growth trend in U.S. oil supply to accelerate sharply in the coming years. The numbers are crazy. We're now forecasting that U.S. oil production (excluding NGLs) will grow **from 5.6 MMBpd in 2010 to a whopping 9.1 MMBpd in 2015.** Including natural gas liquids, **total U.S. petroleum liquid production grows 60% from 7.7 MMBpd in 2010 to 12.2 MMBpd in 2015.**

Anyone familiar with our research knows that we have long been bullish on oil prices based largely on the perception that non-OPEC supply has been in the process of flat lining and that OPEC producers have minimal excess production capacity. We still believe OPEC's excess capacity is well below the cartel's official estimates, but our outlook for U.S. oil supply growth (as detailed in this Stat) has forced us to completely change our tune about non-OPEC supply. Although geopolitical events and potential supply disruptions would provide upside to our oil price estimates, our global oil supply-demand model is simply too loose to support our current rising oil price deck of $105/Bbl WTI in 2013 and $125/Bbl WTI under our long-term (five-year) forecast. Thus, we are **lowering our 2013 WTI forecast 14%** from $105/Bbl WTI **to $90/Bbl WTI** (and our Brent forecast falls from $110/Bbl to $95/Bbl). We are also **lowering our long-term oil forecast from $125/Bbl for both crude benchmarks to $90/Bbl WTI and $95/Bbl Brent.** We are also modestly raising our forecasts for 1Q12 and 2Q12 for Brent and WTI by $5/Bbl to more closely align with the current pricing environment.

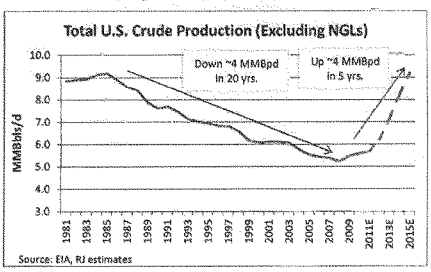
RJ&A Oil Price Estimates (as of February 2012)

2011 Actual	Q1	Q2	Q3	Q4	2011
WTI	$90.41	$103.88	$91.89	$89.87	$94.01
Brent	$97.27	$115.24	$114.96	$114.14	$116.40

2012 Estimates	Q1 12E	Q2 12E	Q3 12E	Q4 12E	2012E
WTI Bloomberg Consensus	$95.00	$98.00	$100.50	$105.00	$98.00
WTI Futures	$99.24	$99.76	$101.28	$98.48	$98.94
Old RJ Oil Est.	$90.00	$90.00	$95.00	$95.00	$92.50
WTI Current RJ Oil	$95.00	$95.00	$95.00	$95.00	$95.00
Brent Bloomberg Consensus	$107.00	$106.70	$112.00	$115.00	$108.50
Brent Futures	$111.31	$110.69	$112.45	$113.90	$111.34
Old RJ Oil Est.	$100.00	$100.00	$100.00	$100.00	$100.00
Brent Current RJ Oil	$105.00	$105.00	$100.00	$100.00	$102.50

2013 Estimates	Q1 13E	Q2 13E	Q3 13E	Q4 13E	2013E
WTI Bloomberg Consensus					$110.50
WTI Futures	$102.15	$101.49	$100.47	$99.84	$100.94
Old RJ Oil Est.	$105.00	$105.00	$105.00	$105.00	$105.00
WTI Current RJ Oil	$90.00	$90.00	$90.00	$90.00	$90.00
Brent Bloomberg Consensus					$118.00
Brent Futures	$112.34	$110.84	$109.34	$107.83	$110.08
Old RJ Oil Est.	$110.00	$110.00	$110.00	$110.00	$110.00
Brent Current RJ Oil	$95.00	$95.00	$95.00	$95.00	$95.00

Source: Bloomberg, Thomson Reuters, RJ est.



As detailed in our Stat of the Week from two weeks ago, *"Lowering 2012 Rig Count Forecast to Reflect a More Modest Rate of Growth,"* the oil rig count has been on a tear for the past two years, growing by 360 (75%) in 2010 and 415 (55%) in 2011. Combining current rig counts with our projections for future growth, we have modeled onshore oil production by play for what we perceive to be the most prominent growth drivers in U.S. oil production – the Eagle Ford, Williston, Permian (horizontal and vertical), DJ Basin Niobrara, Cana Woodford, Granite Wash, Mississippi Lime, and the Barnett. We now see mind-boggling growth from these plays through 2015. Coupling onshore oil growth with rising NGL production and a gradual recovery in the Gulf of

Please read domestic and foreign disclosure/risk information beginning on page 7 and Analyst Certification on page 7.

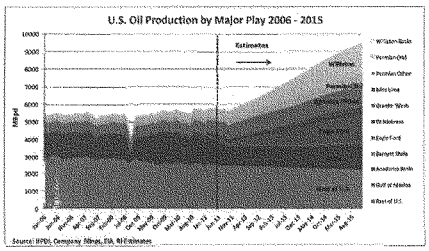
© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Mexico, the outlook for U.S. oil production is nothing short of staggering, painting a more bearish picture for our long-term outlook for both WTI and Brent.

In the driver's seat: Williston, Permian, and Eagle Ford.

The primary drivers behind the growth in U.S. onshore crude production are the Williston, Permian (horizontal and vertical) and Eagle Ford plays. Currently, these three plays account for roughly 40% of U.S. onshore oil production. By 2015, however, we estimate they will account for almost two-thirds of total U.S. onshore output. As we noted a few weeks ago, half of the 55% growth (+ 415 rigs) in the U.S. oil rig count in 2011 came from the Eagle Ford and Permian alone. We continue to believe a hefty portion of the ~200 incremental oil rigs we're modeling for 2012 will be allocated to these two Texas plays. The Williston basin also stands to see substantial growth as pipeline and rail capacity comes online this year and alleviates infrastructure constraints.



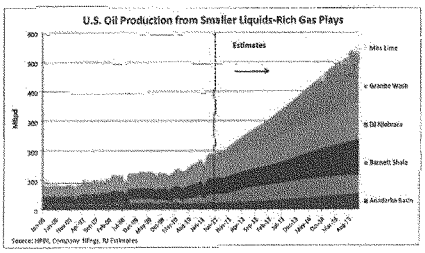
The Eagle Ford has developed seemingly overnight into the single most important driver for U.S. oil production growth over the next 5-10 years. The potential of the pla is probably best evidenced by its skyrocketing rig count, which grew from 63 rigs in January 2010 to 233 rigs at year-end 2011 (vs. 195 in the Williston). We expect to se rapid production growth as these new rigs translate into producing wells. Already, Eagle Ford crude output has grown exponentially from a measly 8,000 Bpd in January 2010 to well over 200,000 Bpd in August 2011 (including condensate). This growth rate would have been even greater if the oil and gas production wasn't restricted by infrastructure constraints That said, we expect transport issues to slowly fade as Eagle Ford crude pipeline capacity increases from 220 MBpd in 1Q12 to 830 MBpd by the end of 2Q12 and 1,100 MBpd by the end of 2012. Note that we don't expect monthly Eagle Ford production to reach 1,000 MBpd until November 2013 but by **the end of 2015, we expect Eagle Ford production alone to exceed 1,600 MBpd.**

When it comes to oil production, the Permian is the gift that keeps on giving. Unlike the Eagle Ford, which has only been around for a few years, the Permian has been producing for decades. In fact, the Permian played a significant role in U.S. oil production growth fifty years ago. In the following decades, the Permian experienced years of declines until it recently reinvented itself – attracting fresh investment and new rigs. The horizontal rig count has ballooned to 104 rigs in December 2011 – a 7-fold increase from January 2010. Over the same time frame, the vertical rig count has nearly doubled to 352 rigs. Since there are so many oil producing zones, many of these vertical wells are completed as if they were horizontal wells. Going forward, rig additions should be biased towards horizontal opportunities like the Wolfcamp, Avalon, and Bone Spring, though vertical rigs should pick up as well.

After a brutally cold winter and spring flooding hampered Williston production in the first half of 2011, the basin rebounded nicely in 2H11. While weather issues put a damper on production growth in 2011, our overall outlook for the Williston remains robust. We anticipate production growing from an estimated 541 MBpd in December 2011 to 808 MBpd in December 2012 and passing the 1,000 MBpd mark by mid-2013. Increased export capacity and debottlenecking will be imperative for this growth to become reality. According to the North Dakota Pipeline Authority, pipeline and rail export capacity from the Williston should exceed 1,000 MBpd around mid-2012 and exceed 1,600 MBpd in 2015. This foots with our projection that Williston production will exit 2015 near 1,700 MBpd.

Other liquids-rich plays provide growth but take a backseat.

The growth contribution from onshore liquids-rich plays outside of the Eagle Ford, Permian, and the Williston will be comparatively small. Combined, the crude production (i.e. not including natural gas liquids – see the next page for more on NGLs) from the Cana Woodford, Barnett, DJ Basin Niobrara, Granite Wash, and Mississippi Lime made up 3.6% (141 MBpd) of total onshore crude production in 2010. Over time, we expect that percentage to increase modestly as these plays are developed and other onshore production areas decline. In fact, production from these plays should more than offset onshore declines in Alaska and California from 2012 through 2015. In 2015, we expect production from these five minor plays to represent 7% (517 MBpd) of total annual onshore production. While the crude production from the Cana Woodford and

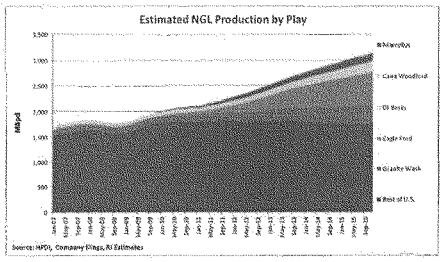


© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

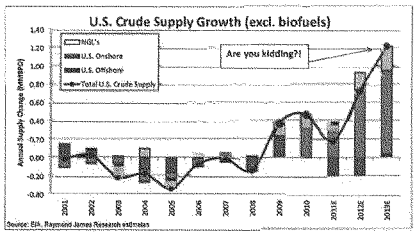
Granite Wash will be muted, these plays will be more prominent contributors to NGL production.

Don't forget about natural gas liquids.
Natural gas liquids, such as ethane, butane, and propane have a number of applications, particularly as feedstocks for refineries and petrochemical plants. NGLs comprise about a quarter of the total U.S. oil supply and have been a meaningful contributing factor in the turnaround of domestic oil production in recent years, growing from 1.8 MMBpd in 2007 to an estimated 2.2 MMBpd in 2011. We expect NGL volumes to continue to grow over the next four years as operators increasingly direct rigs and capital towards liquids-rich opportunities and away from dry gas. As depicted in the adjacent graph, NGL production from the Cana Woodford, DJ Basin Niobrara, Eagle Ford, Granite Wash, and the Marcellus is expected to drive much of the overall growth in output, with the Eagle Ford and Granite Wash leading the way.



Specifically, we are projecting that NGL production will be up over 200 MBpd annually through 2015. All in, we expect that 2015 NGL production will be up over 40% from 2011 to just over 3.0 MMBpd in 2015. To accommodate this growth, NGL pipeline capacity is set to increase from 2.2 MMBpd currently to just under 3.4 MMBpd by mid-2014.

Gulf of Mexico bottoming this year; future growth still up in the air.



In the wake of Macondo, the drilling moratorium, and the current "permitorium," the Gulf of Mexico should drag down overall U.S. production growth in 2012, similar to the negative impact that we saw in 2011 (see adjacent chart). We estimate that Gulf of Mexico oil production was down ~200 MBpd in 2011 resulting in full-year offshore oil production of 1.357 MMBpd. A number of mostly small projects (10,000 Bpd of oil or less) came online in 2011, making the December start-up of LLOG's 20-MBpd "Who Dat" development, which will eventually ramp to 60 MBpd of oil production, one of the more notable projects to start up during the year.

Looking to 2012, we expect a few large oil projects to gradually come online – namely, Noble Energy's Galapagos development (34.5 MBpd), Anadarko's Caesar/Tonga project (45 MBpd), and the Petrobras-operated Cascade-Chinook Floating Production, Storage, and Offloading facility (80 MBpd of capacity). Despite these new projects, we expect 2012 Gulf of Mexico volumes to be down ~200 MBpd as the gradual ramp from these projects is unable to offset declines. Beyond 2012, we're projecting a modest recovery in Gulf of Mexico volumes in 2013-2015, as additional projects are brought online.

But wait, there's more – we're not even modeling Utica production or accounting for imports from Canada.
In case our production estimates for the eight plays described above weren't enough to dampen your outlook for U.S. oil prices over the next few years, let us point out that we aren't including the Utica, Tuscaloosa, or the expected growth in Canadian oil sands production. Given the early stage of activity in these newer plays, there simply isn't enough data for us to even attempt modeling production growth. That said, if the Utica lives up to the hype of being an "Eagle Ford lookalike," the Utica could become a major driver of onshore U.S. oil production, thus providing hefty upside to our current onshore forecast.

Growth in Canadian oil production also stands to have a profound impact on the crude supply available in the U.S., as growing production from the oil sands will likely find its way south via Keystone XL or alternative transportation solutions into Chicago at the very least. The Canadian Association of Petroleum Producers (CAPP) projects that oil sands production will grow from 1.5 MMBpd in 2010 to 2.2 MMBpd in 2015, ramping to over 3.7 MMBpd by 2025. Clearly, as the largest importer of Canadian crude, the U.S. is highly leveraged to the growth in Canadian supply. While some of the oil sands output may eventually be shipped to Asian markets, the U.S. is a fitting destination for heavy oil production out of Canada, given its current (and growing) coking capacity of 2.5 MMBpd. Cokers are the refining units necessary for processing heavy oil. Heavy oil refinery expansion projects in the Midwest have been commissioned specifically to take advantage of rising output from the Canadian oil sands. Of course, the obvious destination for

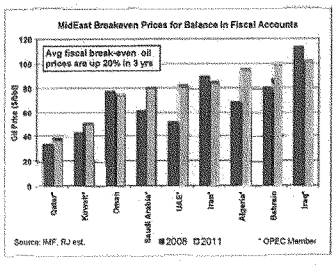
© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Canadian heavies is the high complexity refineries on the Gulf Coast, where Canadian barrels could replace imports from the Middle East or South America.

Where could we be wrong?
If the Utica is the upside to our estimates, the downside would be unforeseen complications associated with type curve changes, execution risk, and infrastructure delays. The type curve assumptions in our play-by-play models are intentionally biased to the conservative side but there's always the potential for actual production to fall short. Risk to our estimates could come from the legal or regulatory front, though we see little reason to worry about permitting in energy-friendly Texas or North Dakota. Unforeseen setbacks for producers, whether company-specific or structural (such as weather issues), could also temporarily hamper our production estimates. Finally, though our growth projections for the Eagle Ford and Bakken align well with the takeaway capacity slated to come online this year and beyond, delays for pipelines or Bakken rail projects could negatively impact the growth curve.

Why is $90 the magic number for WTI?
We believe long-term WTI oil prices will be largely range bound between $80 and $100/Bbl. In our view, the floor of around $80 represents a "breaking point" for OPEC to really start cutting production. The adjacent graph shows an updated estimate of these breakeven points. Check out where Iraq needs prices, and even Saudi's break-even is closer to $80 these days. Additionally, marginal North American oil projects face tougher economics at $80/oil and some may be cut or reduced. The ceiling of around $100 seems appropriate, considering price moves above $100 tend to raise concerns for demand destruction and even more supply growth. Additionally, Saudi Arabia's oil minister blatantly said in January that he hopes to stabilize oil prices around $100 – the first time Saudi has explicitly targeted that high of a price.



Of course, oil prices could be much higher if geopolitical tensions erupt into war, but aside from a geopolitical risk, we see only two real drivers for higher oil prices in 2014-2016 including: (1) China and India's economic growth accelerates to drive hefty increases in oil demand, and (2) the global printing press is forced to work overtime.

Brent-WTI: baking in a $5/Bbl long-term spread.
For much of the past 12 months, forecasting the Brent-WTI crude spread has felt like juggling a stick of dynamite. After the spread peaked near $30 in summer of 2011, the Seaway reversal announcement in mid-November served to "normalize" the spread down to the $10-12/Bbl rail transportation arb cost to get crude to the Gulf Coast. For 2012, our price deck assumes a $10/Bbl Brent-WTI spread in the first half of 2012. By mid-2012, the actual reversal of the Seaway pipeline (150 MBpd, from Cushing to the Gulf Coast) should be able to effectively "clear the glut" and bring the WTI-Brent spread closer to $4-5/Bbl (the pipeline normalized arb level). Seaway's entire capacity of 400 MBpd should be online by early 2013, enabling growing production from the Bakken and other onshore plays to be transported to the Gulf Coast. While Keystone XL has been effectively tabled until after the election, there are other long-haul pipeline projects to the Gulf Coast currently in the works to handle the growth from Canada and the Rockies. Meanwhile, production from the Eagle Ford will bypass Cushing altogether and flow directly to local Gulf Coast refineries in cities like Corpus Christi. Against the backdrop of this relentless wave of U.S. oil production for years to come, we believe it is unlikely WTI will return to parity with Brent. As such, a longer-term transportation differential of $5/Bbl is warranted between Brent and WTI prices, although recognizing that this Brent-WTI spread will undoubtedly remain lumpy.

Conclusion: Robust U.S. oil production puts a damper on our long-term oil price deck.
Not exactly known for being ahead of the curve, the Energy Information Administration (EIA) recently projected that U.S. crude production (excluding NGLs) will grow 20% to 6.7 MMBpd by **2020**. In stark contrast, **we now think full-year U.S. crude production will grow 20% by the end of 2012 – a full seven years ahead of EIA projections!** Our bottom-up analysis of U.S. liquids plays points to significant growth in U.S. oil supply over the next five to ten years. Including natural gas liquids, we're projecting that total U.S. oil production will grow about 55% (or 4.3 MMBpd) from 7.9 MMBpd last year to 12.2 MMBpd in 2015. This does not account for potential production from the Utica or growing Canadian oil sands supply, which would only provide upside to the readily available crude supply in the U.S. Coupling all of these factors, U.S. imports will continue to decline and OPEC spare capacity will drift bearishly higher in coming years. Thus, we are **lowering our 2013 WTI forecast** from $105/Bbl **to $90/Bbl. For Brent we are lowering next year's forecast from $110/Bbl to $95/Bbl Brent.** We are also **lowering our long-term oil forecast from $125/Bbl to $90/Bbl WTI and $95/Bbl Brent.** We should also note that barring significant supply interruptions in the Middle East, we think there is more downside to our long-term forecast than upside.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

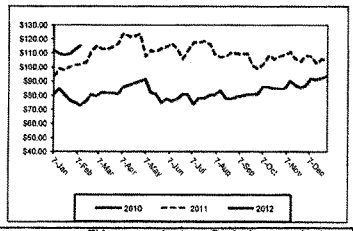
International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Raymond James Weekly Oilfield Review

For Week Ending: 2/10/2012

12 Month Oil Calendar Strip

Brent

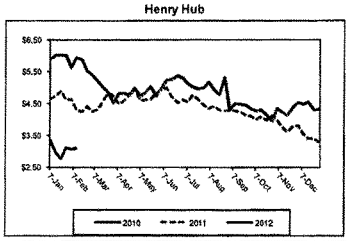


	This Week	Last Week	Beginning of Year	Last Year
Price	$115.14	$112.57	$93.70	$101.80
Percent Change		2.3%	22.9%	13.1%

Source: Bloomberg

12 Month Gas Calendar Strip

Henry Hub



	This Week	Last Week	Beginning of Year	Last Year
Price	$3.08	$3.07	$4.63	$4.31
Percent Change		0.4%	-33.4%	-28.5%

Source: Bloomberg

	10-Feb-12 This Week	3-Feb-12 Last Week	11-Feb-11 Last Year	Change From: Last Week	Change From: Last Year
1. U.S.Rig Activity					
U.S. Oil	1,283	1,245	805	1.4%	56.9%
U.S. Gas	720	745	906	-3.4%	-20.5%
U.S. Miscellaneous	6	7	10		
U.S. Total	1,989	1,997	1,721	-0.4%	15.6%
U.S. Horizontal	1,171	1,174	980	-0.3%	19.5%
U.S. Directional	215	217	225	-0.9%	-4.4%
U.S. Offshore	40	42	26	-4.8%	53.8%
U.S. Offshore Gulf of Mexico					
Fleet Size	113	113	129	0.0%	-12.4%
# Contracted	69	69	60	0.0%	15.0%
Utilization	61.1%	61.1%	46.5%	0.0%	31.4%
U.S. Weekly Rig Permits *	1,522	1,523	1,114	-0.1%	36.6%
2. Canadian Activity					
Rig Count	709	710	630	-0.1%	12.5%
3. Stock Prices (2/10/12)					
OSX	248.0	248.3	269.7	-0.1%	-8.1%
S&P 500	1,342.8	1,344.9	1,329.2	-0.2%	1.0%
DJIA	12,801.2	12,862.2	12,273.3	-0.5%	4.3%
S&P 1500 E&P Index	596.6	580.7	636.8	2.7%	-6.3%
Alerian MLP Index	397.7	396.8	369.8	0.2%	7.6%
4. Inventories					
U.S. Gas Storage (Bcf)	2,888	2,956	2,144	-2.6%	34.7%
Canadian Gas Storage (Bcf)	553	566	330	-2.3%	67.6%
Total Petroleum Inventories ('000 bbls)	874,433	868,636	914,906	0.7%	-4.4%
5. Spot Prices (US$)					
Oil (W.T.I. Cushing)	$98.67	$97.84	$85.58	0.8%	15.3%
Oil (Brent)	$117.67	$114.63	$101.43	2.7%	16.0%
Gas (Henry Hub)	$2.51	$2.41	$3.96	4.0%	-36.7%
Residual Fuel Oil (New York)	$113.13	$108.38	$14.06	4.4%	704.6%
Gas (AECO)	$2.22	$2.15	$3.41	3.3%	-34.9%
UK Gas (ICE)	$11.38	$11.83	$8.91	-3.8%	27.7%

Sources: Baker Hughes, ODS-Petrodata, API, EIA, Oil Week, Bloomberg

** Note: Weekly rig permits reflect a 1 week lag*

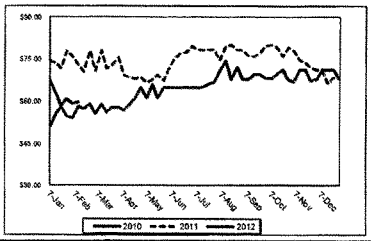
© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Raymond James Weekly Coal Review

For Week Ending: 2/10/2012

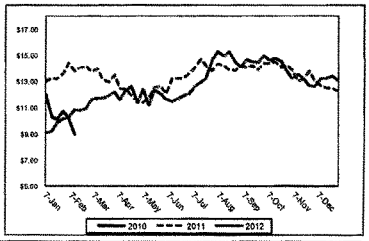
12 Month Big Sandy Barge Prices



	This Week	Last Week	Beginning of Year	Last Year
Price	$59.70	$59.25	$74.10	$75.50
Percent Change		0.8%	-19.4%	-20.9%

Source: Bloomberg

12 Month Powder River Basin 8800 Prices



	This Week	Last Week	Beginning of Year	Last Year
Price	$9.00	$10.25	$13.00	$14.35
Percent Change		-12.2%	-30.8%	-37.3%

Source: Bloomberg

	10-Feb-12 This Week	3-Feb-12 Last Week	11-Feb-11 Last Year	Change From: Last Week	Change From: Last Year
1. Coal Prices					
Eastern U.S.					
CSX 1%	$59.70	$59.25	$75.50	0.8%	-20.9%
Western U.S.					
Powder River 8800	$9.00	$10.25	$14.35	-12.2%	-37.3%
2. Production	3-Feb-12	27-Jan-12	4-Feb-11		
Eastern U.S.	8,499	8,560	9,089	-0.8%	-6.6%
Western U.S.	11,306	11,527	11,366	-1.9%	-0.5%
Total	19,795	20,087	20,455	-1.5%	-3.2%

Source: Bloomberg

Company Citations

Company Name	Ticker	Exchange	Currency	Closing Price	RJ Rating	RJ Entity
Anadarko Petroleum Corp.	APC	NYSE	$	87.04	1	RJ & Associates
ConocoPhillips	COP	NYSE	$	72.25	3	RJ & Associates
Noble Energy, Inc.	NBL	NYSE	$	101.15	3	RJ & Associates
Petróleo Brasileiro S.A.	PBR	NYSE	US$	29.57	S	RJ Latin America

Notes: Prices are as of the most recent close on the indicated exchange and may not be in US$. See Disclosure section for rating definitions. Stocks that do not trade on a U.S. national exchange may not be approved for sale in all U.S. states. NC=not covered.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Important Investor Disclosures

Raymond James & Associates (RJA) is a FINRA member firm and is responsible for the preparation and distribution of research created in the United States. Raymond James & Associates is located at The Raymond James Financial Center, 880 Carillon Parkway, St. Petersburg, FL 33716, (727) 567-1000. Non-U.S. affiliates, which are not FINRA member firms, include the following entities which are responsible for the creation and distribution of research in their respective areas; In Canada, Raymond James Ltd., Suite 2200, 925 West Georgia Street, Vancouver, BC V6C 3L2, (604) 659-8200; in Latin America, Raymond James Latin America, Ruta 8, km 17, 500, 91600 Montevideo, Uruguay, 00598 2 518 2033; in Europe, Raymond James European Equities, 40, rue La Boetie, 75008, Paris, France, +33 1 45 61 64 90.

This document is not directed to, or intended for distribution to or use by, any person or entity that is a citizen or resident of or located in any locality, state, country, or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation. The securities discussed in this document may not be eligible for sale in some jurisdictions. This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. **Investors should consider this report as only a single factor in making their investment decision.**

Investing in securities of issuers organized outside of the U.S., including ADRs, may entail certain risks. The securities of non-U.S. issuers may not be registered with, nor be subject to the reporting requirements of, the U.S. Securities and Exchange Commission. There may be limited information available on such securities. Investors who have received this report may be prohibited in certain states or other jurisdictions from purchasing the securities mentioned in this report. Please ask your Financial Advisor for additional details.

The information provided is as of the date above and subject to change, and it should not be deemed a recommendation to buy or sell any security. Certain information has been obtained from third-party sources we consider reliable, but we do not guarantee that such information is accurate or complete. Persons within the Raymond James family of companies may have information that is not available to the contributors of the information contained in this publication. Raymond James, including affiliates and employees, may execute transactions in the securities listed in this publication that may not be consistent with the ratings appearing in this publication.

Additional information is available on request.

Analyst Information

Registration of Non-U.S. Analysts: The analysts listed on the front of this report who are not employees of Raymond James & Associates, Inc., are not registered/qualified as research analysts under FINRA rules, are not associated persons of Raymond James & Associates, Inc., and are not subject to NASD Rule 2711 and NYSE Rule 472 restrictions on communications with covered companies, public companies, and trading securities held by a research analyst account.

Analyst Holdings and Compensation: Equity analysts and their staffs at Raymond James are compensated based on a salary and bonus system. Several factors enter into the bonus determination including quality and performance of research product, the analyst's success in rating stocks versus an industry index, and support effectiveness to trading and the retail and institutional sales forces. Other factors may include but are not limited to: overall ratings from internal (other than investment banking) or external parties and the general productivity and revenue generated in covered stocks.

The views expressed in this report accurately reflect the personal views of the analyst(s) covering the subject securities. No part of said person's compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in this research report. In addition, said analyst has not received compensation from any subject company in the last 12 months.

Ratings and Definitions

Raymond James & Associates (U.S.) definitions

Strong Buy (SB1) Expected to appreciate, produce a total return of at least 15%, and outperform the S&P 500 over the next six to 12 months. For higher yielding and more conservative equities, such as REITs and certain MLPs, a total return of at least 15% is expected to be realized over the next 12 months.

Outperform (MO2) Expected to appreciate and outperform the S&P 500 over the next 12-18 months. For higher yielding and more conservative equities, such as REITs and certain MLPs, an Outperform rating is used for securities where we are comfortable with the relative safety of the dividend and expect a total return modestly exceeding the dividend yield over the next 12-18 months.

Market Perform (MP3) Expected to perform generally in line with the S&P 500 over the next 12 months.

Underperform (MU4) Expected to underperform the S&P 500 or its sector over the next six to 12 months and should be sold.

Suspended (S) The rating and price target have been suspended temporarily. This action may be due to market events that made coverage impracticable, or to comply with applicable regulations or firm policies in certain circumstances, including when Raymond James may be providing investment banking services to the company. The previous rating and price target are no longer in effect for this security and should not be relied upon.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Raymond James Ltd. (Canada) definitions

Strong Buy (SB1) The stock is expected to appreciate and produce a total return of at least 15% and outperform the S&P/TSX Composite Index over the next six months.
Outperform (MO2) The stock is expected to appreciate and outperform the S&P/TSX Composite Index over the next twelve months.
Market Perform (MP3) The stock is expected to perform generally in line with the S&P/TSX Composite Index over the next twelve months and is potentially a source of funds for more highly rated securities.
Underperform (MU4) The stock is expected to underperform the S&P/TSX Composite Index or its sector over the next six to twelve months and should be sold.

Raymond James Latin American rating definitions

Strong Buy (SB1) Expected to appreciate and produce a total return of at least 25.0% over the next twelve months.
Outperform (MO2) Expected to appreciate and produce a total return of between 15.0% and 25.0% over the next twelve months.
Market Perform (MP3) Expected to perform in line with the underlying country index.
Underperform (MU4) Expected to underperform the underlying country index.
Suspended (S) The rating and price target have been suspended temporarily. This action may be due to market events that made coverage impracticable, or to comply with applicable regulations or firm policies in certain circumstances, including when Raymond James may be providing investment banking services to the company. The previous rating and price target are no longer in effect for this security and should not be relied upon.

Raymond James European Equities rating definitions

Strong Buy (1) Expected to appreciate, produce a total return of at least 15%, and outperform the Stoxx 600 over the next 6 to 12 months.
Outperform (2) Expected to appreciate and outperform the Stoxx 600 over the next 12 months.
Market Perform (3) Expected to perform generally in line with the Stoxx 600 over the next 12 months.
Underperform (4) Expected to underperform the Stoxx 600 or its sector over the next 6 to 12 months.

In transacting in any security, investors should be aware that other securities in the Raymond James research coverage universe might carry a higher or lower rating. Investors should feel free to contact their Financial Advisor to discuss the merits of other available investments.

Rating Distributions

	Coverage Universe Rating Distribution			Investment Banking Distribution		
	RJA	RJL	RJ LatAm	RJA	RJL	RJ LatAm
Strong Buy and Outperform (Buy)	57%	71%	39%	14%	42%	14%
Market Perform (Hold)	37%	28%	54%	5%	30%	3%
Underperform (Sell)	6%	0%	7%	6%	0%	0%

Suitability Categories (SR)

For stocks rated by Raymond James & Associates only, the following Suitability Categories provide an assessment of potential risk factors for investors. Suitability ratings are not assigned to stocks rated Underperform (Sell). Projected 12-month price targets are assigned only to stocks rated Strong Buy or Outperform.

Total Return (TR) Lower risk equities possessing dividend yields above that of the S&P 500 and greater stability of principal.

Growth (G) Low to average risk equities with sound financials, more consistent earnings growth, possibly a small dividend, and the potential for long-term price appreciation.

Aggressive Growth (AG) Medium or higher risk equities of companies in fast growing and competitive industries, with less predictable earnings and acceptable, but possibly more leveraged balance sheets.

High Risk (HR) Companies with less predictable earnings (or losses), rapidly changing market dynamics, financial and competitive issues, higher price volatility (beta), and risk of principal.

Venture Risk (VR) Companies with a short or unprofitable operating history, limited or less predictable revenues, very high risk associated with success, and a substantial risk of principal.

Raymond James Relationship Disclosures

Raymond James expects to receive or intends to seek compensation for investment banking services from the subject companies in the next three months.

Company Name	Disclosure
Anadarko Petroleum Corp.	Raymond James & Associates received non-investment banking securities-related compensation from APC within the past 12 months.

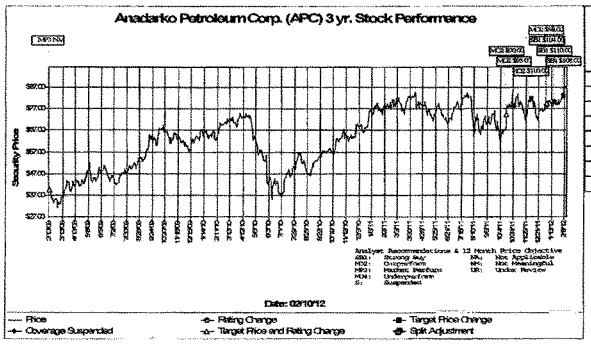
© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

Stock Charts, Target Prices, and Valuation Methodologies

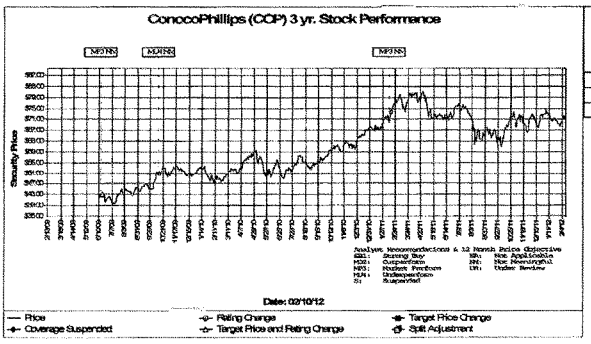
Valuation Methodology: The Raymond James methodology for assigning ratings and target prices includes a number of qualitative and quantitative factors including an assessment of industry size, structure, business trends and overall attractiveness; management effectiveness; competition; visibility; financial condition, and expected total return, among other factors. These factors are subject to change depending on overall economic conditions or industry- or company-specific occurrences. Only stocks rated Strong Buy (SB1) or Outperform (MO2) have target prices and thus valuation methodologies.

Target Prices: The information below indicates target price and rating changes for the subject companies included in this research.



Update Date	Closing Price	Target Price	Rating
2/7/12	82.87	108.00	1
1/18/12	80.24	110.00	1
1/5/12	79.77	104.00	1
1/4/12	78.65	98.00	2
12/6/11	81.73	100.00	2
11/1/11	78.50	95.00	2
10/18/11	74.44	90.00	2
2/13/09	39.35	NM	3

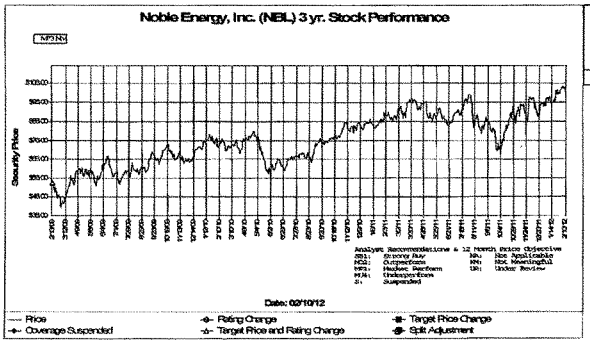
Valuation Methodology: For Anadarko Petroleum Corp., our price target is based on total company NAV. We also consider EV/EBITDA multiples.



Update Date	Closing Price	Target Price	Rating
2/15/11	73.77	NM	3
10/14/09	50.97	NM	4
6/17/09	43.10	NM	3

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863



Update Date	Closing Price	Target Price	Rating
2/13/09	53.48	NM	3

Risk Factors

General Risk Factors: Following are some general risk factors that pertain to the projected target prices included on Raymond James research: (1) Industry fundamentals with respect to customer demand or product / service pricing could change and adversely impact expected revenues and earnings; (2) Issues relating to major competitors or market shares or new product expectations could change investor attitudes toward the sector or this stock; (3) Unforeseen developments with respect to the management, financial condition or accounting policies or practices could alter the prospective valuation; or (4) External factors that affect the U.S. economy, interest rates, the U.S. dollar or major segments of the economy could alter investor confidence and investment prospects. International investments involve additional risks such as currency fluctuations, differing financial accounting standards, and possible political and economic instability.

Specific Investment Risks Related to the Industry or Issuer

Coal Industry Risks

Oil and Gas Price Volatility
Profitability of companies producing crude oil and natural gas is directly affected by changes in oil and gas prices. These prices are influenced by a multitude of regional, national and global factors, many of which are outside the control of companies in the industry. Supply-related factors include industrywide levels of capital spending and production decisions by OPEC. Demand-related factors include macroeconomic conditions.

International Risk
Essentially all integrated majors have significant upstream operations in developing countries. This may result in elevated levels of political and currency risks. Political risks include adverse changes in laws and policies governing operations of foreign-based companies and/or increases in royalty and tax rates. Some operations may be especially vulnerable to political and social instability. Currency risks include the possibility of legal restrictions on currency transfers and exchange rate fluctuations. International operations may also be adversely affected by laws and policies of a company's home country regarding foreign trade and taxation.

Commodity Price Volatility Could Cause Significant Fluctuations in Earnings
Over the past couple of years, thermal coal prices have been strong by historical standards. Strength in the global steel market has pushed metallurgical coal prices to the high-double-digit to low-triple-digit range. The domestic weather and economic health, as well as the state of the global economy, are important factors with regard to industry earnings. While we anticipate thermal and metallurgical coal prices to remain strong over the next several years, should coal prices retreat for whatever reason (supply growth, demand reduction, etc.), earnings would likely react negatively.

Heavy Governmental Regulation Poses Financial Risk to Coal Producers
The coal industry is heavily regulated by federal, state, and local government organizations for a number of different matters, including: 1) employee health, retirement and safety protection, 2) permitting and licensing requirements, 3) air quality standards, 4) water pollution, 5) plant & wildlife protection, and 6) reclamation and restoration of mining properties after operations are completed, among others. Such regulations can cause mining companies to incur substantial costs, which could be detrimental to the financial health of the company.

Exploration Risk

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

All exploration activities involve inherent risks, including the risk that no commercially viable oil and gas reserves will be discovered. In addition, companies may often be uncertain as to the future cost or timing of drilling, completing and producing wells. Drilling operations may be curtailed, delayed or canceled as a result of the additional exploration time and expense associated with many factors, including unexpected drilling conditions, equipment failures or accidents, adverse weather conditions, or delays in the availability of drilling rigs or equipment.

Joint Venture Risk
Most integrated majors conduct some of their operations through joint ventures in which they may share control with other participants. There is a risk that other participants may have interests that are inconsistent with the company's. Also, if other participants are unable to meet their economic or other obligations, the company may be required to fulfill those obligations alone.

Transportation Disruptions Could Lead to Quarterly Shipment Volatility
Aside from actual production problems at individual mines, transportation disruptions can also lead to volatility when it comes to quarterly shipment volumes. Over the past several years, there have been a number of instances where transportation has not kept pace with expectations, either due to weather issues, accidents, or simply insufficient capacity to meet new volumes. This has been a particularly acute problem with rail transportation in both the East and the West.

The Mining Industry Is Subject to Inherent Choppiness for a Variety of Potential Reasons

Mining is an inherently choppy business from one quarter to the next for a number of reasons such as: 1) weather-related interruptions, 2) periodic equipment or geological problems, 3) the potential for activity disrupting accidents, 4) transportation disruptions or unavailability, 5) seasonal factors such as holidays, and 6) productivity issues such as long-wall moves. These factors make predicting earnings from one quarter to the next almost impossible with any accuracy, and the flare up of one or more of these issues can negatively impact results.

Oil and Gas Price Volatility
Profitability of companies producing crude oil and natural gas is directly affected by changes in oil and gas prices. These prices are influenced by a multitude of regional, national and global factors, many of which are outside the control of companies in the industry. Supply-related factors include industrywide levels of capital spending and production decisions by OPEC. Demand-related factors include macroeconomic conditions.

Company-Specific Risks for Anadarko Petroleum Corp.

Exploration Focus Increases the Company's Relative Risk Profile
Anadarko's focus on cutting-edge exploration exposes shareholders to higher capital reinvestment risks than other companies in the sector that focus proportionately more on lower risk exploitation and development projects. Given the company's sheer size, it may increasingly need to focus on high-impact projects to achieve its growth objectives that may also carry higher risks.

Oil and Natural Gas Price Volatility
Prices for oil and natural gas fluctuate widely, and Anadarko's revenues, profitability, and future growth depend substantially on prevailing prices for oil and gas. Also, lower oil and gas prices can influence the company's cash flow and capital available to reinvest in drilling projects, which could impact Anadarko's ability to grow its operations. To manage commodity price volatility, in the normal course of its business, Anadarko typically enters into hedging transactions on a portion of its expected production.

Potential Increases in Service Costs
Future increases in drilling and other service costs could affect Anadarko's profitability. As industry participants accelerate drilling activity in response to the high commodity prices, costs will likely rise. However, attractive rates of return may continue to be achievable, depending on the level of future commodity prices and Anadarko's hedging program.

International Expansion
As the company expands its operations internationally, Anadarko will become increasingly more exposed to various risks inherent in foreign operations. These risks may include, among other things, loss of revenue, property, and equipment as a result of hazards such as expropriation, war, insurrection, and other political risks, increases in taxes and governmental royalties, renegotiation of contracts with governmental entities, changes in laws and policies governing operations of foreign-based companies, currency restrictions and exchange rate fluctuations, and other uncertainties arising out of foreign government sovereignty over the company's international operations. The company's international operations may also be adversely affected by laws and policies of the United States affecting foreign trade and taxation.

Additional Risk and Disclosure information, as well as more information on the Raymond James rating system and suitability categories, is available at ricapitalmarkets.com/SearchForDisclosures_main.asp. Copies of research or Raymond James' summary policies relating to research analyst independence can be obtained by contacting any Raymond James & Associates or Raymond James Financial Services office (please see raymondjames.com for office locations) or by calling 727-567-1000, toll free 800-237-5643 or

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

sending a written request to the Equity Research Library, Raymond James & Associates, Inc., Tower 3, 6th Floor, 880 Carillon Parkway, St. Petersburg, FL 33716.

For clients in the United Kingdom:

For clients of Raymond James & Associates (RJA) and Raymond James Financial International, Ltd. (RJFI): This report is for distribution only to persons who fall within Articles 19 or Article 49(2) of the Financial Services and Markets Act (Financial Promotion) Order 2000 as investment professionals and may not be distributed to, or relied upon, by any other person.

For clients of Raymond James Investment Services, Ltd.: This report is intended only for clients in receipt of Raymond James Investment Services, Ltd.'s Terms of Business or others to whom it may be lawfully submitted.

For purposes of the Financial Services Authority requirements, this research report is classified as objective with respect to conflict of interest management. RJA, Raymond James Financial International, Ltd., and Raymond James Investment Services, Ltd. are authorized and regulated in the U.K. by the Financial Services Authority.

For institutional clients in the European Economic Area (EEA) outside of the United Kingdom:

This document (and any attachments or exhibits hereto) is intended only for EEA institutional clients or others to whom it may lawfully be submitted.

For Canadian clients:

Review of Material Operations: The Analyst and/or Associate is required to conduct due diligence on, and where deemed appropriate visit, the material operations of a subject company before initiating research coverage. The scope of the review may vary depending on the complexity of the subject company's business operations.

This report is not prepared subject to Canadian disclosure requirements.

For Latin American clients:

Registration of Brazil-based Analysts: In accordance with Regulation #483 issued by the Brazil Securities and Exchange Commission (CVM) in October 2010, all lead Brazil-based Research Analysts writing and distributing research are CNPI certified as required by Art. 1 of APIMEC's Code of Conduct (www.apimec.com.br/supervisao/codigodeconduta). They abide by the practices and procedures of this regulation as well as internal procedures in place at Raymond James Brasil S.A. A list of research analysts accredited with the APIMEC can be found on the webpage (www.apimec.com.br/ certificacao/Profissionais Certificados).

Non-Brazil-based analysts writing Brazil research and or making sales efforts with the same are released from these APIMEC requirements as stated in Art. 20 of CVM Instruction #483, but abide by recognized Codes of Conduct, Ethics and Practices that comply with Articles 17, 18, and 19 of CVM Instruction #483.

Proprietary Rights Notice: By accepting a copy of this report, you acknowledge and agree as follows:

This report is provided to clients of Raymond James only for your personal, noncommercial use. Except as expressly authorized by Raymond James, you may not copy, reproduce, transmit, sell, display, distribute, publish, broadcast, circulate, modify, disseminate or commercially exploit the information contained in this report, in printed, electronic or any other form, in any manner, without the prior express written consent of Raymond James. You also agree not to use the information provided in this report for any unlawful purpose.

This report and its contents are the property of Raymond James and are protected by applicable copyright, trade secret or other intellectual property laws (of the United States and other countries). United States law, 17 U.S.C. Sec.501 et seq, provides for civil and criminal penalties for copyright infringement.

© 2012 Raymond James & Associates, Inc., member New York Stock Exchange/SIPC. All rights reserved.

International Headquarters:
The Raymond James Financial Center | 880 Carillon Parkway | St. Petersburg, Florida 33716 | 800-248-8863

RAYMOND JAMES

Mr. WHITFIELD. Thank you, Mr. Freeman.

Mr. Weiss, you are recognized for 5 minutes.

STATEMENT OF DANIEL J. WEISS

Mr. WEISS. Thank you, Chairman Whitfield, thank you, Ranking Member Rush and members of the subcommittee for the opportunity to testify today.

Congress must not ignore climate science when developing energy policies. Promoting an energy independence plan that increases carbon pollution is like setting your house on fire to stay warm. It may work at first but the long-term consequences are horrendous. Any North American energy independence plan must reduce carbon pollution too.

This year, the polluted climate struck back with the worst U.S. drought in over 50 years and the third hottest summer ever measured, and the drought has cost us at least $5 billion in crop damage so far.

The Obama administration's all-of-the-above energy strategy includes both pollution reductions and domestic energy production. It modernized fuel economy standards, which will save drivers $1 per gallon. We cut carbon pollution from cars and invested in clean-energy technologies. Renewable electricity generation has doubled. Domestic oil production is the highest in 15 years, and imports are the lowest. Natural-gas production is the highest ever. Seventy-thousand new oil and gas jobs have been created in the last 3 years.

To build on these successes, we must continue to invest in renewable energy, energy efficiency and clean vehicles and fuels so that our companies can compete with those in other Nations. Without incentives, financiers will invest elsewhere, effectively outsourcing clean-energy jobs to China and other nations with more supportive policies.

Domestic oil production benefits our economy and security. Fewer imports will reduce our trade deficit. But more domestic production won't do much to lower prices at the pump because gasoline prices are mostly based on oil prices that are set on a world market controlled by the OPEC cartel.

The Associated Press tested whether more U.S. drilling would lower gasoline prices by analyzing three decades of U.S. production and price data. The AP found, and I quote, "no statistical correlation between how much oil comes out of U.S. wells and the price at the pump." Canada is oil-independent yet it had the same high gasoline prices this year as the United States did.

Contrary to some claims, expansion of drilling into protected public lands and waters would have little impact on gasoline prices. However, such policies would increase carbon and other pollution because many oil and natural-gas production techniques generate significant emissions.

In addition, there is a proposal now to let States decide whether to allow oil drilling in National Park Service units and other public lands within their borders. This tempts States to sanction drilling to generate oil revenues rather than safeguard the natural resources of these lands for their owners who are the American peo-

ple. The New York Times noted, and I quote, "States tend to be interested mainly in resource development."

Yesterday, the Center for American Progress released data highlighting 30 National Park units that could have future oil and gas drilling, including the Flight 93 Memorial in Pennsylvania and Everglades National Park in Florida. These places would be vulnerable to oil drilling if Federal oversight is eliminated in favor of more relaxed State rules.

A columnist for Field and Stream magazine warned that State control of energy development on public lands would devastate outdoor activities: "When it comes to the future of public hunting and fishing, fewer proposals could be more frightening."

The proposal to build the Keystone XL pipeline won't increase our energy security much either. A significant portion of the Canadian tar sands oil would flow to Gulf Coast refineries and be refined and exported as diesel or gasoline, and the increase in production of energy-intensive Canadian tar sands oil made possible by the pipeline would add even more carbon pollution to our overburdened atmosphere. In fact, Raymond James and Associates—John Freeman is a representative—predicts a significant oil production increase in the coming years without any expansion of drilling into protected places or weakening of environmental safeguards. A quote from their report: "By 2020, based on domestic oil production, growth in biofuels and declines in demand, we expect net imports to reach essentially zero."

To become more energy independent while reducing carbon pollution, we must increase investments in efficiency and clean-electricity vehicles and fuels. We can pay for these investments by ending $2.4 billion of annual special tax breaks for the five largest oil companies: BP, Chevron, ConocoPhillips, ExxonMobil and Shell. These five companies made $60 billion in profits in the first half of 2012, and a recorded $137 billion in 2011. The money from these tax breaks would be better invested in the clean energy technology of the future that will make us both energy independent and cut carbon pollution. That would lead to real energy independence.

Thank you very much.

[The prepared statement of Mr. Weiss follows:]

Center for American Progress Action Fund

1333 H Street, NW, 10th Floor
Washington, DC 20005
Tel: 202 682.1611 • 202 682.1867

www.americanprogressaction.org

Daniel J. Weiss
Senior Fellow
Center for American Progress Action Fund

Testimony on "The American Energy Initiative: A Focus on the Outlook for Achieving North American Energy Independence within the Decade"

Energy and Power Subcommittee of the Energy and Commerce Committee
2322 Rayburn House Office Building
September 13, 2012

Chairman Whitfield, Ranking Member Rush, and members of the subcommittee, thank you very much for the opportunity to testify today.

I am Daniel J. Weiss, a Senior Fellow at the Center for American Progress Action Fund, a tax exempt organization dedicated to improving the lives of Americans by transforming progressive values and ideas into policy.

The question posed for this hearing is "A Focus on the Outlook for Achieving North American Energy Independence Within the Decade."

Many experts are optimistic that the reduction of oil demand combined with the increase of domestic oil and natural gas production could further reduce oil imports by 2020. Citi GPS predicts that "between 2010 and 2020…the fuel economy of the entire fleet could rise by 16 percent."

Raymond James & Associates predicts a significant oil production increase in the coming years *without* any expansion of drilling into protected places or weakening of public health and natural resources protections.

But Congress must not ignore climate science when developing energy policies. **Promoting an energy independence plan that increases carbon pollution is like setting your house on fire to stay warm. It may work at first but the long term consequences are horrendous.**

This year the polluted climate continued to strike back, with the worst U.S. drought in over 50 years. The National Oceanic and Atmospheric Administration determined that the United States experienced the most extreme weather in a century, and it was the third hottest summer ever.

The Obama administration is moving toward energy independence while reducing climate pollution by establishing modern fuel economy standards and investing in clean energy technologies. We are also producing more oil and gas under new worker safety and health protections. We are using and importing less oil. Domestic oil production is the highest in 15 years. Natural gas production is the highest ever measured.

Last year the United States invested the most capital of any country in clean energy technologies to help us remain competitive in the $2 trillion worldwide clean technology market. It is essential that the United States continue to invest in renewable electricity, energy efficiency and clean alternative fueled vehicles so that our domestic clean tech companies can compete with companies in other nations. Without incentives to invest in this emerging industry, we will cede these jobs and exports to China, Germany and other nations that do support their clean tech industry.

Domestic oil production provides important economic and security benefits. Fewer oil imports will reduce our trade deficit with other nations. But more production won't do much to lower prices at the pump because the oil prices that determine gasoline prices are set on world market controlled by the OPEC cartel.

The Associated Press tested whether more U.S. drilling would lower gasoline prices when it conducted an exhaustive analysis of 36 years of monthly U.S. oil production and gasoline price data. **AP found "No statistical correlation between how much oil comes out of U.S. wells and the price at the pump."** The Wall Street Journal noted that residents of essentially oil free Germany paid about the same for gasoline as we did in recent years. (minus taxes, of course.)

Because more domestic oil production will have little impact on gasoline prices, "North American energy independence" proposals that expand drilling into previously protected places are unlikely to ease pain at the pump. However, such proposals *will* increase carbon and other pollution because many oil and natural gas production techniques generate significant emissions.

Giving states the authority to allow drilling in National Park Service units and other public lands within their borders tempts them to seek oil revenues rather than safeguard health and natural resources. The *New York Times* noted "States, as a rule, tend to be interested mainly in resource development."

Yesterday the Center for American Progress released data highlighting 30 National Park units that face the prospect of future oil and gas drilling, including the Flight 93 Memorial and Everglades National Park. These places would be vulnerable if federal oversight of energy on public lands is eliminated in favor of more relaxed state regulations.

Building the Keystone XL pipeline won't increase our energy security much because a portion of the Canadian tar sands oil flowing to our Gulf Coast refineries will be exported as diesel or gasoline to Europe or South America. But, the pipeline will foster an increase in energy intensive tar sands oil production in Canada. This will add even more carbon pollution to our overburdened atmosphere, further exacerbating climate change and its harmful and costly consequences.

The most important step we can take to become more energy independent while reducing carbon pollution would be to increase investments in the clean electricity, vehicles, and fuels of the future. The revenue to pay for such investments should come from closing $2.4 billion of annual special tax breaks for the five largest oil companies – BP, Chevron, ConocoPhillips, ExxonMobil, and Shell. These five companies made $60 billion in profits in the first half of 2012, on top of a record $137 billion in 2011. Surely the money from these tax breaks would be better invested in the clean energy technologies of the future instead of adding to the coffers of some of the most profitable companies in the world.

Climate change impact grows; 2012 is 3rd hottest summer on record

In this day and age, it is irresponsible and reckless to consider energy policy proposals without assessing their impact on climate change. Those policies that would reduce carbon pollution should be adopted. Energy policies that would increase pollution will boost the huge health costs associated with increasing the atmospheric burden of carbon and other pollutants responsible for climate change. Ignoring an increase in carbon pollution to increase energy independence is like setting your house on fire to stay warm – it may work at first but the long term consequences are horrendous.

Why must we reduce carbon pollution to slow climate change? We need look no further than the headlines from 2012 to get a glimpse of our future if carbon pollution continues unabated. This has been another record year of extreme weather.

- The National Oceanic and Atmospheric Administration's U.S. Climate Extremes Index determined that January through August 2012 in the contiguous United States had the most extreme weather in 100 years.[1]

- The National Oceanic and Atmospheric Administration's National Climatic Data Center concluded that summer 2012 in the contiguous United States was the "3rd hottest summer on record." Only the summers of 2011 (74.5°F) and 1936 (74.6°F) had higher average temperatures for the Lower 48.[2]

- There were more record daily high temperatures from January 1, 2012 to August 5, 2012, then in all of 2011. And 2011 had the second hottest summer on record[3]

- The contiguous United States had its warmest July ever since record keeping began in 1895, according to the National Climatic Data Center.[4]

- The United States experienced the "largest moderate to extreme drought area (based on the Palmer Drought Index) since the 1950s," concluded the National Climatic Data Center.[5] This cost insurers $5 billion for crop damages as of mid-August.[6]

- Last year the United States experienced a record 14 extreme weather events that caused more than $1 billion damages and losses.[7]

Some may argue that an individual weather event cannot be linked to global warming. That ignores our new reality. Nearly **"all weather events are affected by climate change because the environment in which they occur is warmer and moister than it used to be."** [8] Climate change makes heat waves longer and more intense. This in turn makes droughts longer and more intense, which then makes wildfire seasons longer and more intense. And warmer temperatures yield more water vapor in the atmosphere, which makes rainstorms more intense.

These extreme weather conditions over the past several years – drought, severe storms, floods, heat waves – are *precisely* the events that scientists have spent years warning us would occur if human produced carbon pollution continued unchecked.

Scientists determined that there is a strong relationship between climate change and extreme weather. The Nobel Prize winning Intergovernmental Panel on Climate Change reinforced this link in the "Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation" in March 2012.[9]

Scientists reviewed "over 1,000 scientific publications," to craft the report. The IPCC warned of "unprecedented extreme weather and climate events," including

· *Medium confidence [50 percent likelihood] in an observed increase in the length or number of warm spells or heat waves in many regions of the globe.*

· *Likely increase [66 percent likelihood] in frequency of heavy precipitation events or increase in proportion of total rainfall from heavy falls over many areas of the globe.*

· *Medium confidence in projected increase in duration and intensity of droughts in some regions of the world.*

The American Meteorological Society, or AMS, recently reiterated that climate change is human induced and underway. On August 20, 2012, the AMS reemphasized the threat posed by climate change.

> *There is unequivocal evidence that Earth's lower atmosphere, ocean, and land surface are warming; sea level is rising; and snow cover, mountain glaciers, and Arctic sea ice are shrinking.* ***The dominant cause of the warming since the 1950s is human activities. This scientific finding is based on a large and persuasive body of research.*** *The observed warming will be irreversible for many years into the future, and even larger temperature increases will occur as greenhouse gases continue to accumulate in the atmosphere.*
>
> ***Avoiding this future warming will require a large and rapid reduction in global greenhouse gas emissions.*** *The ongoing warming will increase risks and stresses to human societies, economies, ecosystems, and wildlife through the 21st century and beyond, making it imperative that society respond to a changing climate.*
>
> *Technological, economic, and policy choices in the near future will determine the extent of future impacts of climate change.*[10]

The AMS recognized what the National Academy of Sciences reiterated in 2010 about the human impact on our climate. The academy determined that global warming is real, and human induced:

> *There is a strong, credible body of evidence, based on multiple lines of research, documenting that* ***climate is changing and that these changes are in large part caused by human activities.*** *While much remains to be learned, the core phenomenon, scientific questions, and hypotheses have been examined thoroughly and have stood firm in the face of serious scientific debate and careful evaluation of alternative explanations.*[11]

Dr. Richard Muller, a former climate change skeptic, recently conducted a lengthy analysis of temperature data partially fund by the Charles G. Koch Charitable Foundation (of Koch Industries and Americans for Prosperity fame).[12] This research project concluded that climate change is real and human induced. He wrote in The *New York Times:*

> *Following an intensive research effort involving a dozen scientists, I concluded that global warming was real and that the prior estimates of the rate of warming were correct. I'm now going a step further: Humans are almost entirely the cause.*[13]

Climate change will also affect energy production and independence. The Energy Information Administration determined that the "worst drought in decades could affect U.S. energy markets." [14] Earlier this week the *Washington Post* reported that

> *Drought and rising temperatures are forcing water managers across the country to scramble for ways to produce the same amount of power from the hydroelectric grid with less water, including from behemoths such as the Hoover Dam.*
>
> *Hydropower is not the only part of the nation's energy system that appears increasingly vulnerable to the impact of climate change, as low water levels affect coal-fired and nuclear power plants' operations and impede the passage of coal barges along the Mississippi River.* [15]

Drought conditions can also interfere with the hydraulic fracking employed to produce shale gas. Citi GPS found that

> *Fracking is a water-intensive process. The EPA estimates that 1.2 to 3.5 million gallons of water is used to frack a well.*
>
> *Water is the very component in hydraulic fracking that makes the current shale gas and oil boom possible by creating fractures in the oil and gas-bearing shale gas rock thousands of feet below ground.* [16]

Some of the largest tight oil and shale gas fields are in Texas plagued by drought in 2011 and 2012. NOAA predicts that the nationwide drought conditions will remain mostly unchanged through the end of November.[17]

With the drought and other extreme weather events plaguing the United States during the past several years, it is essential that proposals to achieve "North American Energy Independence" must reduce carbon pollution. This would help slow the growth of heat waves, droughts, floods, smog, tropical diseases and other effects of climate change.

North American energy independence plan that rely solely on drilling will worsen climate change

Energy independence plans that rely solely on more oil and natural gas production can exacerbate climate change. Burning oil from transportation and other purposes contributes 42 percent of U.S. energy related carbon pollution, according to the Energy Information Administration.[18] Natural gas adds another 24 percent. Combustion of these fuels just adds to the carbon pollution burden in the atmosphere.

In addition, the production of oil and gas also yields carbon and methane pollution that contributes to climate change. Companies producing "tight oil," such as in the Bakken Shale in North Dakota emit additional carbon pollution through flaring employed "to eliminate gas at mineral exploration sites, and…pressure relief valves to ease the strain on equipment."[19]

Reuters reports that

> *The World Bank estimates that the flaring of gas adds some 360 million tonnes of carbon dioxide (CO2) in annual emissions, almost the same as France puts into the atmosphere each year or the equivalent to the yearly emissions from around 70 million cars.* [20]

The *New York Times* reported last year that in North Dakota,

> *Every day, more than 100 million cubic feet of natural gas is flared this way — enough energy to heat half a million homes for a day.*
>
> *The flared gas also spews at least two million tons of carbon dioxide into the atmosphere every year, as much as 384,000 cars or a medium-size coal-fired power plant would emit.*[21]

The United States is the third largest flarer in the world, and has more than doubled its flaring between 2009 and 2011, according to the World Bank.[22]

The production of shale gas from hydraulic fracking often releases fugitive methane, which is 25 times more potent greenhouse gas than carbon. Citi GPS describes the fugitive emission as

> *Something that is not transformed into energy but is instead released into the air. Capturing that would be key, given the outsized impact of methane in a 20-year GWP [Global Warming Potential] scenario, though less so in a 100-year GWP scenario.* [23]

Preventing the leakage and venting of methane from fracking shale gas will reduce pollution while saving companies money. A March 2012 Natural Resources Defense Council report "Leaking Profits" identified ten commercially available methane control technologies that can capture more than 80% of methane currently wasted. This pollution reduction is equivalent to removing 40 million cars from the road. Selling the methane for energy generation would yield $2 billion annually in revenue.[24]

The production of Canadian tar sands oil requires significantly more energy compared to conventional oil, so it results in more pollution. The 830,000 barrels per day to be shipped through he Keystone XL pipeline (discussed in more detail below), would add 27 million metric tons more of carbon pollution in the atmosphere annually.

Moving forward to achieving energy independence

There are three primary components to increase energy independence, create jobs, and reduce pollution:

- Use existing resources more efficiently
- Develop clean energy technologies
- Increase production of existing resources

The United States has moved forward in each of these areas since 2008 without drastic changes to the current balance between energy production, public health protection, and efficient use of resources. With status quo energy policies that leave protected places alone, Raymond James & Associates projects

> *Further declines [in oil imports]... By 2020 – based on the assumptions we previously outlined for domestic oil production, growth in biofuels, and declines in demand – we expect net imports to reach essentially zero. That's right – oil independence.* [25]

Each pillar is addressed below.

Oil imports falling due to modern fuel economy standards and investments in advanced vehicle technology

There are clear benefits to importing less foreign oil. It enhances our national security to reduce dependence on oil from nation's that are less friendly to us than Canada and Mexico. In addition, fewer imports help our balance of trade since oil imports make up half of the trade defecit. In addition, the dollars spent on foreign oil would be better put to work domestically. In 2011, for instance, the United States spent $371 billion on foreign oil.[26] Once these funds are sent overseas, they are gone from our economy and produce no additional economic activity. Lower imports can boost economic growth.

Since 2008, U.S. oil imports have fallen by 12 percent. Last year the Energy Information Administration noted,

> *By the broadest measure, U.S. dependence on imported oil fell below the 50 percent mark last year for the first time since 1997.*[27]

And this summer Energy Information Administration noted that there was a significant drop in oil consumption in 2011, and further reductions in 2012.

> *Total [liquid fuels] consumption fell by 340 thousand bbl/d [barrels per day] (1.8 percent) last year.*
>
> *Motor gasoline consumption accounted for the bulk of that decline, shrinking by 260 thousand bbl/d (2.9 percent). In 2012, total consumption falls by a further 170 thousand bbl/d (0.9 percent).*[28]

A major reason for this decline in imports is improved fuel economy. In 2010, the Obama administration – working with auto companies and workers -- finalized the first improvement in fuel economy standards in two decades, which took affect beginning in model year 2012.[29] They are already reducing oil use. On September 6 the Energy Information Administration noted

The implied average fuel efficiency of the in-use light-duty vehicle fleet rose by roughly 1.1 percent in the first half of 2012 versus the comparable year-ago period.

Efficiency gains likely reflect both increasingly stringent Corporate Average Fuel Economy (CAFE) standards that were implemented for light-duty trucks starting in model year 2008 and for passenger cars starting in model year 2011. [30]

The Obama administration recently finalized the second phase of modern fuel economy and carbon pollution standards for model year 2017 through 2025 cars and light duty trucks. These standards are supported by the autoworkers, all of the domestic auto companies and most of the foreign companies. They will reduce oil use by 2 million barrels per day in 2025 compared to 2010, and grow to 3.1 million barrels per day of savings in 2030.[31]

Citi GPS predicts "between 2010 and 2020, the weighted-average fuel economy of the entire fleet nationally could rise by 16 percent."[32] In addition, these fuel economy standards will save owners of a 2025 model car a net $4,400 in fewer gasoline purchases over the life of the vehicle compared to a 2010 car.[33]

As part of the effort to reduce oil use, the Department of Energy invested in advances vehicles through the Advanced Technology Vehicle Manufacturing program and the Advanced Research Projects Agency-Energy (ARPA-E), both signed into law by President George W. Bush. The first program helps companies modify their manufacturing facilities to build more efficient cars. The latter program will help companies "reduce costs and improve the performance of next generation [battery] storage technologies."

Electric vehicles, such as the plug-in hybrid electric Chevrolet Volt, continue to grow in popularity. General Motors sold nearly twice as many Volts in the first eight months of 2012 compared to all of 2011.[34] Publicly available recharging infrastructure would increase the desirability of these gasoline sipping vehicles. Without such infrastructure, demand growth is limited and some advanced battery companies have struggled recently. As with other emerging advanced technologies, driving market demand certainty for the product would help provide investors and companies with more confidence.

Both the Senate and House plan to install public recharging stations for electric vehicles driven by legislators and their staff. Americans should have the same access to such recharging infrastructure. There is bipartisan legislation in Congress that would establish a "race to the top" for communities to receive federal investment to develop public recharging infrastructure. This would increase accessibility for drivers and therefore the attractiveness of these vehicles. The bills are sponsored by Sens. Lamar Alexander (R-TN) and Jeff Merkley (D-OR), and Reps. Judy Biggert (R-IL) and Ed Markey (D-MA).[35]

Clean energy has boomed under President Obama and investments have increased; Gov. Romney wants to end these policies

Since 2008 there has been dramatic expansion of clean energy. Electricity generation from renewables from non-hydro power resources doubled in three years.[36] In August, wind electricity

generation reached 50 gigawatts -- equal to 11 nuclear power plants or 44 coal-fired power plants -- and double the electricity compared to 2008. [37] Some states now rely on wind to generate significant amounts of electricity, such as Iowa, where 20 percent of electricity is generated from wind. The growth in the wind industry has increased domestic content of wind generation equipment from 50 to 70 percent.[38] The Department of Energy estimated that wind could provide 20 percent of our electricity by 2030.[39]

Solar electricity has also grown dramatically, expanding by 285 percent since 2008. U.S. solar developers installed 742 megawatts of solar photovoltaic cells in the second quarter of 2012. And if growth continues, the industry could install more than 3,000 megawatts of projects this year, according to a new market report from GTM Research and the Solar Energy Industries Association.[40]

Geothermal generated power increased by 13 percent during this time.[41] During the first half of 2012, renewable electricity projects were more than 38 percent of new electrical generation capacity.[42]

These successes were due to federal and state policies that encouraged private investments in clean energy projects, including state renewable portfolio/electricity standards, tax credits, and loan guarantees. These programs generally leverage far more private capital than their federal contribution – sometimes as high as 13 to 1, according to DBL Investors. Some of these federal programs, such as the Production Tax Credit for wind energy, expire at the end of 2012. Some wind companies have already begun to lay off employees in response to decline in demand due to uncertainty about future incentives.[43]

Fortunately, a bipartisan group of Senate Finance Committee members voted to extend the Production Tax Credit for a year. Conservative Sens. Chuck Grassley (R-IA) and John Thune (R-SD) led this effort. Senate Majority Leader Harry Reid (D-NV) said on Tuesday that he would likely bring a bill to the Senate floor before the election to extend the expiring production, energy efficiency, and alternative fuels tax credits. He fears, however, that enough Republican senators are "going to run out the clock," by using stalling tactics.[44] Any delays will halt progress, and the wind industry will continue to shed jobs.

An American disinvestment in wind energy couldn't come at a worse time as global competition for the $2 trillion clean energy market continues to heat up. In 2011, global investments in renewable energy surpassed investments in fossil fuels for the first time.[45]

The United States' $48 billion in clean energy investments in 2012 led the world.[46] U.S. companies received more than 75 percent of all venture capital investments in clean technologies. But our status as a clean energy leader is far from permanent. We must continue to support the policies that have catapulted us to first place and ensure that our clean energy economy—which grew by 8.3 percent during the depths of the recession from 2008 to 2009—continues to thrive.[47]

Other nations such as Brazil, China, Germany, and India recognize the promise of clean energy for economic growth and have adopted long-term policies to attract domestic and foreign

investment in their growing clean tech industries. Germany, for instance, generates one-quarter of its electricity from renewable energy.[48]

Four major financial institutions—Wells Fargo, Bank of America Corp., Goldman Sachs Group, Inc., and Citigroup, Inc.—have embraced clean energy by pledging to invest a combined $170 billion in these technologies.[49] It is critical that the United States create a favorable economic climate so that these clean energy investments are made here and not elsewhere.

Abandoning clean energy incentives will take us backwards, and cede clean tech jobs to China and other nations. To continue our forward progress towards energy independence from volatile, dirty coal, we must continue to encourage private capital investments in clean tech.

Domestic oil and gas boom since 2008

In addition to fuel economy improvements, President Obama presided over an enormous boom in oil and gas production, including from federal lands and waters. Data from the Energy Information Administration confirms this assessment. The Energy Information Administration determined that in 2011 the United States produced 646 million barrels of crude oil from federal lands and waters compared to 575 million barrels in 2008—a 12 percent increase in production. Oil production from federal areas was higher in every year from 2008 to 2011 than in 2006 to 2008. Since 2003, the most oil produced from federal lands was in 2011, and the most from federal waters was in 2010.[50]

The Congressional Research Service reiterated Energy Information Administration's finding that oil production from public lands is higher under the current administration compared to the last years of the previous one. CRS concluded that "oil production on federal lands is up slightly in 2011 when compared to 2007."[51]

Production from oil from the waters in the Gulf of Mexico is rebounding after the BP Deepwater Horizon oil disaster in 2010. The number of oil rigs in the Gulf of Mexico has rebounded to the number before the tragedy. In July, Barclays Equity Research noted that

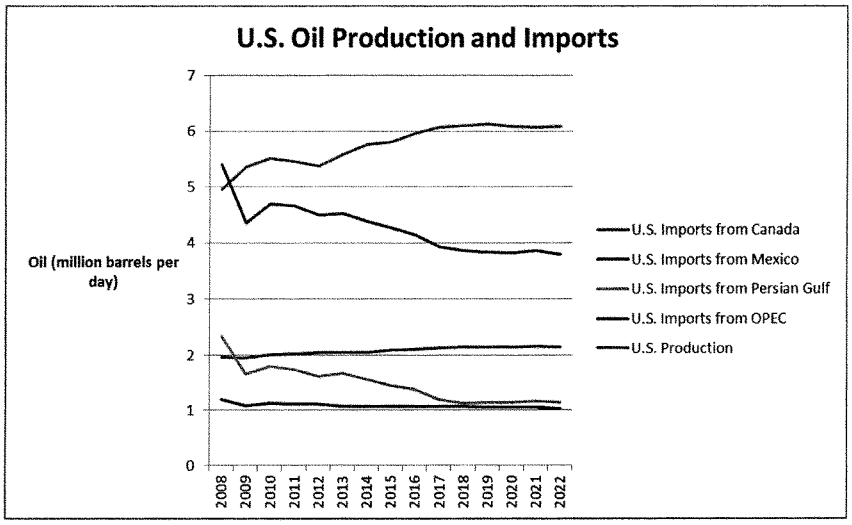
> *The offshore rig count in the Gulf of Mexico is nearing its pre-Macon do [pre-Deepwater Horizon disaster] level and is expect to grow another 50 percent by 2014, one of the most visible indicators of the Gulf drilling revival.*[52]

This growth in offshore oil production has occurred along with the implementation of a number of new worker and rig safety requirements developed in response to the BP tragedy. Since the new standards were put into place, the Obama administration has approved nearly 700 permits for activities at hundreds of wells in the Gulf of Mexico alone.[53]

BP must spend at least $22 billion in compensation for the economic and natural resource losses from this calamity.[54] Congress has yet to raise the liability cap for future oil blowouts. It remains at an absurdly low $75 million, which could leave taxpayers responsible for billions of dollars of costs should another accident occur.

Many of the publicly owned lands with coal, oil, or natural gas are under the purview of the Bureau of Land Management. These lands are owned by all Americans, and have traditionally been managed to "meet the present and future needs of the American people."[55] This includes allowing grazing, hunting, and recreation as well energy production on these publicly owned lands.

The Department of Interior has opened up huge acreage of land to oil and gas development. The department's Bureau of Land Management conducted three of the top five largest sales in the agency's history in 2011. [56] This year the Bureau of Safety and Environmental Enforcement approved controversial projects to drill in the Arctic Ocean and close to wilderness areas near Desolation Canyon, Utah. This level of oil and gas activity on public lands led The *New York Times* to conclude that "The score card shows that the [oil] industry is winning" its quest to open previously protected lands to drilling.[57]



Source: Energy Information Administration: Energy Outlook, Imported Liquids by Source

Expanded domestic drilling won't affect gasoline prices

Whenever oil and gasoline price spikes occur, Big Oil and its political allies revive their demand for "drill, baby, drill." But because oil prices are set by the world market, more domestic drilling

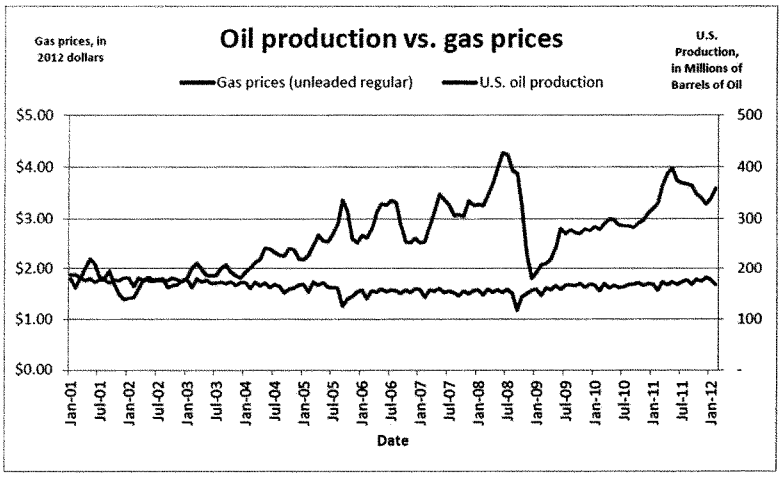
cannot really alter the price at the pump. Even oil independent nations such as Canada experienced high gasoline prices this year.[58]

The Wall Street Journal reiterated that there is little relationship between domestic oil production and gasoline prices:

> *Producing a lot of oil doesn't lower the price of gasoline in your country. According to the U.S. Energy Information Administration, Germans over the past three years have paid an average of $2.64 a gallon (excluding taxes), while Americans paid $2.69, even though the U.S. produced 5.4 million barrels of oil per day while Germany produced just 28,000.* [59]

To test whether more U.S. drilling would lower gasoline prices, the Associated Press just completed an exhaustive analysis of 36 years of monthly U.S. oil production and gasoline price data. AP found that there is:

> *No statistical correlation between how much oil comes out of U.S. wells and the price at the pump. If more domestic oil drilling worked as politicians say, you'd now be paying about $2 a gallon for gasoline. Instead, you're paying the highest prices ever for March.*[60]



Source: Associated Press

The Cato Institute, a free-market think tank, came to a similar conclusion earlier this year, arguing,

> *Is President Obama responsible for the spiraling price of gasoline?*
>
> *The facts say no... Why have gasoline prices increased since the start of the year? The simplest explanation is that the price of crude oil has increased.*[61]

Proposal to give states control of federal lands threatens national parks

Proposals to allow states to control energy development in national forests, parks, wilderness areas, and other federal lands are designed to allow energy companies more access to them. States have much more incentive to allow energy production on these federal lands since they would derive a portion of the royalties and tax revenue from the extraction of resources. Oil companies want states to control these areas in order to bypass federal public health and environmental safeguards.

Additionally, states would have the authority to permit drilling or mining in or near these previously protected places without the thorough public involvement currently required by the federal review process. And as The *New York Times* noted "states, as a rule, tend to be interested mainly in resource development."[62]

Giving states control of resource development on federal lands is a real threat to some of America's most special places for hunting, fishing, hiking, and recreation. They could permit controversial projects near national parks such as uranium mining around the Grand Canyon, oil and gas drilling near Arches National Park in Utah, and coal mining 10 miles from that state's picturesque Bryce Canyon National Park.

Oil and gas production is dirty business. The industrial roads, heavy equipment, drilling chemicals and pollution from fossil fuel production would destroy or contaminate the natural resources in these places that are owned by all Americans.

The proposal to allow states to decide the fate of energy resources in these special places prompted opposition from sportsmen and many other citizens who enjoy or benefit from areas. Bob Marshall, a columnist for *Field and Stream*, a popular outdoor activities magazine, recently wrote, "When it comes to the future of public hunting and fishing—especially out West—fewer proposals could be more frightening."[63]

Some oil companies oppose this proposal. The International Association of Drilling Contractors – which includes both rig owners and oil field service companies – said that proposals to turn over federal lands to the states for fossil fuel production would harm their business. It would create uncertainty for them because it would force these companies to comply with a patchwork with state rules rather than meet a single federal health and safety standards.[64]

Mid-Atlantic offshore drilling would interfere with national defense

There have been recent proposals to open areas off the Atlantic coast for oil and gas production. Such proposals, however, could impair national security because a large portion part of this area is critical for a wide array of military training, including explosives, submarine exercises and Navy SEAL training.

The Department of Defense wants to prohibit offshore drilling in a vast majority of the 2.9 million acre zone under consideration for oil production off Virginia.[65] About 20 percent, or 630,000 acres, would be open to drilling.[66] Secretary of the Interior Ken Salazar reiterated that Defense Department needs will take precedence over the energy industry.[67]

Similarly, proposals to open the Gulf coast of Florida to expanded oil and gas production would also interfere with Department of Defense training. Tom Neubauer, president of the Bay Defense Alliance, raised concerns about conflict with the Navy during an April 2012 public hearing on the expansion of drilling. He warned:

> *The Gulf test range, which is essentially everything east of the military mission line, which comes down from Pensacola into the Gulf of Mexico, is really essential to nine bases in Northwest Florida.*
>
> *Most of those bases do testing and training, research and development in the Gulf of Mexico. ... Drilling in those areas would impair those missions.*[68]

One of the benefits of energy independence would be enhanced national security. It makes little sense to strive for that goal by drilling in places that would interfere with our security.

Drilling in these two places important to our military is even less sensible because "about 70 percent of undiscovered oil and gas resources are on federal lands that are available for leasing under current laws and administrative policies" according to recent analysis by the Congressional Budget Office.[69]

The expansion of drilling into previously protected places also threatens other values. For instance Florida's tourism and coastal businesses activities (including fish and wildlife, ports, and defense-related industries) generate more than $175 billion in economic benefits and 2.2 million jobs annually.[70] The Outer Banks of North Carolina – an area vulnerable to a mid-Atlantic oil spill – attracts more than 7 million visitors each year.[71] Even a modest oil spill could devastate the local economies of these two coasts.

Advocates for opening these areas also argue that the revenue from additional production could provide important revenue to the federal government. The Congressional Budget Office, however

> *Anticipates that production from newly opened areas of the OCS over the 2023–2035 period would be far less than the amounts produced by current operations in the Gulf of Mexico.*[72]

More oil drilling in offshore or in other protected places won't reduce gasoline prices or speed energy independence by 2020 because it takes seven years for new offshore oil drilling to produce any oil.[73] The Energy Information Administration found that opening up the currently protected Atlantic and Pacific coasts won't have an impact on price. The administration also predicts that it will take 10 years to produce oil from the Arctic National Wildlife Refuge in Alaska.[74]

Ken Green, a resident scholar with the conservative think tank American Enterprise Institute, explained that crude oil is a global commodity whose price will be unaffected by new U.S. production. In 2011 *Greenwire* reported that Green said,

> *The world price is the world price. Even if we were producing 100 percent of our oil," Green said, if prices increase because of a shortage in China or India, "our price would go up to the same thing ... We probably couldn't produce enough to affect the world price of oil," he added. "People don't understand that.* [75]

Export of Keystone XL Pipeline tar sands oil means the pipeline won't increase energy independence or lower gasoline prices

Canadian tar sands oil is very energy intensive to produce, so it yields 15 percent or more carbon pollution compared to conventional oil production.[76] Canada is already a net oil exporting nation so it wants to export the tar sands oil to the United States via the Keystone XL pipeline that would run from Hastings CK Alberta through the central United States to Port Arthur, Texas, home to oil refineries. EPA determined that such a move could increase carbon pollution by up to 27 million metric tons compared to conventional oil production.[77]

The oil industry claims that approval of the northern section of the Keystone XL pipeline will increase American energy security and reduce dependence on oil from outside North America. This assertion is inconsistent with the record. There is evidence that companies will export at significant sahre of the petroleum products refined from the 830,000 barrels a day of tar sands oil that would flow from Alberta to the oil refineries in the Gulf Coast.

Texas refineries make gasoline and diesel out of oil to sell both domestically and internationally. Energy Information Administration notes that that "worldwide demand for diesel fuel and other distillate fuel oils has been increasing steadily, with strong demand in China, Europe, and the United States."[78] This raised the price for diesel, and makes it an attractive export. A Natural Resources Defense Council analysis of Energy Information Administration data determined that

> *Gulf Coast refiners... [have] the greatest access and capacity to export to international diesel markets. Today these refiners have started reconfiguring their operations to prioritize diesel for international customers over gasoline for U.S. customers. Data from the fourth quarter of 2011 indicate that the majority of refined products produced in Texas Gulf Coast refineries were exported on the international market.* [79]

Canadian tar sands oil refined in the United States then sold to Europe or South America will do little to either lower gasoline or diesel prices here, or increase our energy security.

It is clear that at least some of the tar sands oil will be refined here and exported abroad. At an Energy and Power Subcommittee hearing on December 2, 2011, Rep. Ed Markey (D-MA) asked Alex Pourbaix, TransCanada's president for energy and oil pipelines, if he would "commit to not having that [Keystone XL] oil sold outside the United States?" Mr. Pourbaix said "No, I can't do that."[80]

With uncertainty about the ultimate destination of the Keystone XL oil, no wonder that Time magazine concluded "Keystone would have little immediate [price] effect, especially since there's already sufficient pipeline infrastructure in place for the next few years."[81]

The State Department's analysis of the project found that it would have little impact on U.S. oil supplies or prices at the pump. The State Department's final "Keystone XL assessment" concluded that it would not increase oil supply or lower prices:

> *WORLD and ETP studies indicate that building versus not building Keystone XL would not* ***of itself*** *have any significant impact on: U.S. total crude runs, total crude and product import levels or costs. [emphasis original]* [82]

The State Department analysis also determined that the pipeline would only have a tiny impact on the price of crude and other products:

> *Under the KXL scenario, delivered prices for [oil sands] ... into PADD3 Gulf Coast are lower than under the No KXL case and those for PADD2 [Midwest], higher. The effect is limited, no more than around $0.70/bbl [per barrel].* [83]

This level of reduction translates to roughly one penny and a half per gallon of gasoline.

In addition, the State Department analysis acknowledges that the pipeline would actually raise gasoline prices in the Midwest since it would eliminate the current oil glut there that has kept prices lower. Bloomberg cautions that the pipeline "risks raising prices as much as 20 cents a gallon in the Midwest, Great Plains and Rocky Mountains." [84]

The bottom line: building the Keystone XL pipeline will not increase energy independence or lower gasoline prices while increasing carbon pollution when we must be lowering it instead to avoid the most severe impacts of climate change.

Oil and gas lease and permit process reforms

In response to concerns from the oil and gas industry, the Department of Interior undertook reforms to make oil and gas leasing on public lands more efficient and transparent. The new rules provide the Bureau of Land Management with the opportunity to consider other uses of the land in order to identify the best areas for oil and gas development.

These reforms did not take effect until the start of 2011, but initial data reveal some encouraging trends. In the report "Making the Grade (Almost)," The Wilderness Society analyzed

government data for calendar year 2011 and the first quarter of 2012, and found that there has been a dramatic reduction in litigation against oil and gas leases in most places.[85]

Prior to the reforms, from 2007 to 2009, 83 percent of leases offered in the intermountain West were challenged. At that time, there was little opportunity for public participation in the process without litigation. In 2011, however, only 25 percent of the leases offered were protested in the intermountain West. That's nearly a two-thirds reduction in protests in the first year, and data from the first quarter of 2012 show a continuation in that trend.

Other efforts to increase certainty for oil and gas producers by reducing the length of permitting reviews have had some success. According to a May report released by the Department of the Interior, the backlog of applications for permits to drill has been reduced by 24 percent since 2008.[86] Plus, the department recently announced a new "automated tracking system" that it hopes will reduce the time to review and issue a lease by two-thirds.

Oil companies not using federal leases

Despite their demand to open fragile, previously protected places for oil and gas production, oil and gas companies are not developing many of the leases that they already hold. A huge portion of leases held for public lands and waters lack exploration or development plans according to Department of Interior data. The department found that 56 percent of the leased acres onshore in the lower 48 states are not in production or exploration. The percentage is even larger offshore, where 72 percent of leased acres are dormant.[87]

This simply means that big oil companies currently hold the keys to vast amounts of publicly owned resources but have chosen not to develop them right now. As of the end of fiscal year 2011, there were more than 38 million onshore acres under lease, but the industry was only actively producing on just more than 12 million acres.[88] The story holds true down the line, given that as of the end of fiscal year 2011, the industry was holding more than 7,000 authorized permits to drill with parcels that were unexplored or undeveloped.[89]

Idle leases in the Gulf of Mexico contain large amounts of oil. The tracts that are not producing oil or subject to pending or approved exploration and development plans are estimated to contain 17.9 billion barrels of "undiscovered technically recoverable resources" oil and 49.7 trillion cubic feet of UTRR natural gas.[90]

According to the same report from the Department of Interior, "More than 70 percent of the tens of millions of offshore acres under lease are inactive." This includes almost 24 million acres that do not have "approved exploration or development plans" in the Gulf of Mexico. This area has an estimated 11.6 billion barrels of oil and 50 trillion cubic feet of natural gas.[91]

In addition to the idle leases, there have been several indications that the industry is less interested in the actual resources available on public lands and waters. As the Energy Information Administration put it:

> *The rapid increase in natural gas production from shale resources over the last 5 years has significantly affected natural gas prices and the relative attractiveness of Federal and Indian lands as areas for development of conventional natural gas resources.*[92]

As the price of natural gas dropped, there was a dramatic decline in the amount of public land nominated by the industry for leasing. Since fiscal year 2006 there has been nearly a 67 percent decline in the amount of onshore public land nominated by the industry in the Rocky Mountain States.[93] As one industry expert told *The Wall Street Journal*, "It is safe to say that there will be fewer natural gas wells drilled in 2012." [94]

Given the current low price of natural gas, there is simply less demand from industry to drill at all, let alone on public lands. In addition, the oil and gas industry has been less focused on public lands and waters, since many of the best resources are currently located on private land. And oil companies drill where the best resources are.

More gasoline exports raise gasoline prices?

While imports are down, exports of refined petroleum products are up. In 2011 the United States exported an average of 2.9 million barrels per day of petroleum products and was a net exporter for the first time since 1949. The Energy Information Administration reports that gasoline exports were more than 62 percent higher in 2011 compared to 2010.

Exports are also greater share of total fuel production. Gasoline exports are 7 percent of gasoline production in 2012, up from 5 percent in 2010. As of March 30, 2012, the United States exports an average of 956,000 barrels of diesel per day. This is a 46 percent increase from the annual average for 2010, when we were exporting 656,000 barrels a day.

Big Oil companies are largely leading this export boost, selling significantly more gasoline and diesel fuels to other nations. On March 27 *The Wall Street Journal* reported two of the big five oil companies—ConocoPhillips and Shell—are "more focused on exporting U.S.-produced fuel to markets where there is greater demand." Energy Information Administration data indicates that gasoline and diesel exports rose as their prices rose.

The Energy Information Administration also notes, "Record gasoline exports do not appear to be driving gasoline prices." But it also points out that "Gulf Coast refiners have a competitive advantage in some world markets." These companies make more money exporting refined products to Europe and South America than by to selling them to American citizens.

Gulf Coast refiners use West Texas Intermediate crude oil, which is now typically $18 to $22 cheaper per barrel than the Brent crude, which is used by European refiners. This makes U.S. refined fuels cheaper compared to European products.

Although the Energy Information Administration did not find a direct link between exports and higher gasoline prices, exporting fuel rather than selling it here could deprive us of inventory that could help ease price pressure.

The export of crude oil produced in the lower 48 states is already effectively banned. Limiting exports of refined products from petroleum produced from public lands or waters—as some have proposed—could increase the supply of gasoline and diesel fuel here and potentially reduce prices.

The United States had a ban on the export of crude oil produced in the north slope of Alaska from 1973–1995. Instead, this oil was sent to the West Coast, increasing supplies there. In 2005 the Congressional Research Service found indicators that West Coast gasoline prices were lower during the export ban: "When Alaskan oil exports ceased, the gasoline price differential between the West Coast and the national average did decline, at least for a few years."

It is unclear whether a new ban on exports of products refined from oil from public lands and waters would make a significant difference in gasoline prices, as the Alaskan ban seemed to do for at least some time. The Congressional Research Service wrote:

> *To what degree prohibiting gasoline exports would reduce prices is unclear. Some contend that there may be a decline in gasoline prices if gasoline exports were restricted. Others [such as the American Petroleum Institute] suggest there will be no decline in gasoline prices if such measures were adopted.*[95]

But certainly an additional domestic supply of gasoline and diesel produced from American oil on our soil and in our waters would not raise prices—and it might just lower them. The bottom line is that it makes little sense to send to other countries refined fuels made from oil produced on federal lands and waters at a time of rising gasoline prices.

Cut tax breaks to invest in oil use reduction technologies

As previously noted, an important element of energy independence is continuing investments in the clean energy technologies of the future. One way to do that while not dramatically increasing spending would be to end tax breaks for the big five oil companies -- BP plc, Chevron Corp., ConocoPhillips, ExxonMobil Corp., and Royal Dutch Shell Group. They receive $2.4 billion in annual tax breaks according to the Congressional Joint Committee on Taxation.[96] Instead of these tax breaks, this revenue should be invested in technologies to reduce oil demand and other clean energy technologies.

These special tax preferences include one designed to keep manufacturing facilities in the United States. Another was enacted way back in 1916, when it made economic sense to help the fledgling oil industry grow, but little sense today for the big five companies that routinely earn multibillion-dollar profits.[97]

These tax breaks serve no economic or fiscal function any longer, yet in testimony before Congress, Harold Hamm, chairman and CEO of Continental Resources Inc., said that the United States must retain tax breaks for the oil and gas industry.[98] This position ignores that the big five oil companies had lower oil production and fewer U.S. employees over the last half decade despite growing profits. [99] [100]

The House of Representatives-passed budget would retain these tax breaks.[101] Rep. Paul Ryan (R-WI) claims that his budget would eliminate tax breaks in exchange for lower rates, but his plan doesn't specify a single tax break that it would eliminate. The House budget would also lower the top corporate income tax rate by nearly one third. A Center for American Progress Action Fund analysis estimates that the House budget's nearly one-third reduction in the corporate tax rate could lower the big five oil companies' annual tax bill by $2.3 billion per year, based on an assessment of their 2011 financial statements filed with the Securities and Exchange Commission.[102]

The big five oil companies that receive these tax benefits are quite profitable. In the first half of 2012, the five big oil companies earned a combined $62.2 billion, or $341 million per day. The huge earnings during the first half of 2012 follows the big five companies' record profit of $137 billion in 2011 thanks to high oil and gasoline prices. ExxonMobil, Chevron, and ConocoPhillips were the first-, second-, and 13th-most profitable public U.S. companies in 2011, respectively.[103]

Some of these large profits end up in their $72 billion in cash reserves. And these five companies used 31 percent of their mid-year 2012 profits to buy back their own stock, which enriches shareholders but doesn't add to oil supplies or investments in alternative fuels or other new technologies. Even with these huge earnings and large cash reserves, however, these companies produced 6 percent *less* oil than one year ago. (see Table)

How Big Oil spends its profit windfall

Profits of the big five oil companies in the first and second quarter of 2012

Company	Q1 2012, (billions $)	Q2 2012, (billions $)	2012 total (billions $)	Stock buybacks as a percentage of 2012 profit	Percent change in liquids production* from Q2 2011 to Q2 2012
BP	$5.9	$(1.4)	$4.5	N/A	-11%
Chevron	$6.5	$7.2	$13.7	19%	-5%
ConocoPhillips	$2.9	$2.3	$5.2	96%	-6%
ExxonMobil	$9.5	$15.9	$25.4	42%	-6%
Shell	$7.7	$5.7	$13.4	7%	-3%
Total	**$32.5**	**$29.7**	**$62.2**	**31%**	**-6%**

*Liquids production includes oil and natural gas liquids.
Sources: Company profit reports

The big three U.S. publicly owned oil companies—Chevron, ConocoPhillips, and ExxonMobil—paid relatively low federal effective tax rates in 2011. Reuters reports that their tax payments were "a far cry from the 35 percent top corporate tax rate."[104] It reported that ConocoPhillips paid an effective federal tax rate of 18 percent last year. In addition, ExxonMobil paid 13 percent

of its U.S. income in taxes after deductions and benefits in 2011, according to a Reuters calculation based on ExxonMobil's securities filings. Chevron paid about 19 percent.[105]

.

These tax breaks for the extremely prosperous big five oil companies make little economic sense. Instead, these funds should be invested in oil demand reduction and the clean energy technologies of the future, including electric vehicles. This reform will speed American energy independence.

This testimony builds upon the analysis of Center for American Progress Action Fund colleagues Danielle Baussan, Richard Caperton, Jessica Goad, Christy Goldfuss, Seth Hanlon, Matt Kasper, Stephen Lacey, Rebecca Leber, Noreen Nielsen, Joe Romm, and Jackie Weidman. Any errors are the author's alone.

---

[1] The National Oceanic and Atmospheric Administration, "U.S. Climate Extremes Index" available at http://www.ncdc.noaa.gov/extremes/cei/graph/cei/ytd (last accessed September 2012).

[2] The National Oceanic and Atmospheric Administration, "State of the Climate National Overview" available at http://www.ncdc.noaa.gov/sotc/national/2012/8 (last accessed August 2012).

[3] Andrew Freedman, "High Times: More Record Highs than All of Last Year," *Climate Central*, August 7, 2012 available at http://www.climatecentral.org/news/more-record-highs-during-2012-so-far-than-all-of-2011-14768/.

[4] Ibid.

[5] The National Oceanic and Atmospheric Administration, "Historical Analogs, July 2012 Drought Report," available at http://www.ncdc.noaa.gov/sotc/drought/#det-hist-analog (last accessed August 2012).

[6] Noah Buhayar, "Insurers May Have $5 Billion U.S. Drought Cost," *Reuters*, August 21, 2012, available at http://www.bloomberg.com/news/2012-08-21/crop-insurer-losses-may-exceed-5-billion-from-drought-s-p-says.html.

[7] The National Oceanic and Atmospheric Administration, "Billion Dollar Weather/Climate Disaster, 2011" available at http://www.ncdc.noaa.gov/billions/ (last accessed August 2012).

[8] Joe Romm, "Must-Read Trenberth: How to Related Climate Extremes to Climate Change," *Climate Progress*, March 25, 2012, available at http://thinkprogress.org/climate/2012/03/25/451347/must-read-trenberth-how-to-relate-climate-extremes-to-climate-change/?mobile=nc.

[9] Intergovernmental Panel on Climate Change, "Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation," (2012).

[10] Joe Romm, "Meteorological Society: Warming is 'Unequivocal,' We're the 'Dominant Cause,' We Need 'Rapid Reduction' of CO2," *Climate Progress*, August 28, 2012, available at http://thinkprogress.org/climate/2012/08/28/757991/meteorological-society-warming-is-unequivocal-were-the-dominant-cause-we-need-rapid-reduction-of-co2/.

[11] America's Climate Choices: Panel on Advancing the Science of Climate Change, National Research Council. "Summary." *Advancing the Science of Climate Change*. (Washington, DC: The National Academies Press, 2010).

[12] "Berkeley Earth Project: Financial Support," available at http://berkeleyearth.org/donors/ (last accessed August 2012).

[13] Richard Muller, "The Conversion of a Climate-Change Skeptic," *The New York Times*, July 28, 2012, available at http://www.nytimes.com/2012/07/30/opinion/the-conversion-of-a-climate-change-skeptic.html?_r=2&pagewanted=all.

[14] U.S. Energy Information Administration, "Worst Drought in decades could affect U.S. energy markets," August 28, 2012, available at http://www.eia.gov/todayinenergy/detail.cfm?id=7730#.

[15]Juliet Eilperin, "Climate change challenges power plant operations," *The Washington Post*, September 9, 2012, available at http://www.washingtonpost.com/national/health-science/climate-change-challenges-power-plant-operations/2012/09/09/42b26b8e-f6a5-11e1-8b93-c4f4ab1c8d13_story.html.

[16] Edward L. Morse and others, "Energy 2020: North America, the new Middle East?," *Citi Group*, March 20, 2012, available at http://fa.smithbarney.com/public/projectfiles/ce1d2d99-c133-4343-8ad0-43aa1da63cc2.pdf.

[17] [17] National Weather Service, "U.S. Seasonable Drought Outlook," September 6, 2012, available at http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html.

[18] U.S. Energy Information Administration, "What are the energy-related carbon dioxide emissions by source and sector for the United States?," June 22, 2012, available at http://www.eia.gov/tools/faqs/faq.cfm?id=75&t=11.

[19] Henning Gloystein and Alessandra Prentice, "Natural Gas Flaring Rises Globally, Fueled by U.S. Shale Boom," *Reuters/The Huffington Post*, May 3, 2012, available at http://www.huffingtonpost.com/2012/05/03/natural-gas-flaring-rises-globally_n_1474838.html.

[20] Ibid.

[21] Clifford Krauss, "In North Dakota, Flames of Wasted Natural Gas Light the Prairie," *The New York Times*, September 26, 2011, available at http://www.nytimes.com/2011/09/27/business/energy-environment/in-north-dakota-wasted-natural-gas-flickers-against-the-sky.html?_r=1&pagewanted=print.

[22] Global Gas Flaring Reduction, "Estimated Flared Volumes from Satellite Data, 2007-2011" *The World Bank*, June 14, 2012, available at http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTOGMC/EXTGGFR/0,,contentMDK:22137498~menuPK:3077311~pagePK:64168445~piPK:64168309~theSitePK:578069,00.html#1.

[23] Edward L. Morse and others, "Energy 2020: North America, the new Middle East?."

[24] Natural Resources Defense Council, "Leaking Profits: How the Oil and Gas Industry Can Reduce Pollution, Conserve Resources, and Make Money by Preventing Methane Waste," March 2012, available at http://www.nrdc.org/energy/files/Leaking-Profits-FS.pdf.

[25] J. Marshall Adkins and Pavel Molchanov, "Yes, Mr. President, We Believe We Can Drill Out Way out of this Problem," Raymond James and Associates, April 2, 2012, available at http://www.raymondjames.com/AdvisorSitesFiles/PublicSites/silentKthoughts/files/Yes_Mr_President.pdf.

[26] Ibid.

[27] Elio Ohep, "U.S. Oil Import Dependence: Going Down No Matter What," *Petroleumworld*, May 29, 2011, available at http://www.petroleumworld.com/sunopf11052901.htm.

[28] U.S. Energy Information Administration, "Short Term Energy Outlook: U.S. Crude Oil and Liquid Fuels," September 11, 2012, available at http://www.eia.gov/forecasts/steo/report/us_oil.cfm.

[29] Heather Zichal, "We Can't Wait: Driving Forward with New Fuel Economy Standards," The White House Blog, November 16, 2011, available at http://www.whitehouse.gov/blog/2011/11/16/we-can-t-wait-driving-forward-new-fuel-economy-standards.

[30] U.S. Energy Information Administration, "What is Driving U.S. Gasoline Consumption," September 6, 2012, available at http://www.eia.gov/oog/info/twip/twip.asp.

[31] Ibid.

[32] Edward L. Morse and others, "Energy 2020: North America, the new Middle East?,"

[33] National Highway Traffic Safety Administration, "CAFE – Fuel Economy" available at http://www.nhtsa.gov/fuel-economy (last accessed September 12, 2012).

[34] Michael Wayland, "GM: Chevrolet Volt sales in 2012 already surpass last year; on track to sell nearly 18,000," available at http://www.mlive.com/auto/index.ssf/2012/07/gm_chevrolet_volt_sales_in_201.html (last accessed September 2012).

[35] Promoting Electric Vehicles Act, S. 948, 112th Congress . 1 Sess.(Government Printing Office, 2011) was introduced in the Senate to provide incentives for rapid electric vehicle development. The bill, S. 948, sponsored by Sens. Lamar Alexander (R-TN) and Jeff Merkley (D-OR), would help communities create electrification infrastructure and provide grants for companies to electrify their fleets. Bill information available at http://thomas.loc.gov/cgi-bin/query/z?c112:S.948.IS: The Electric Drive Vehicles Deployment Act, H.R. 1685, 112th Congress. 1 Sess., introduced by Reps. Judy Biggert (R-IL) and Ed Markey (D-MA), implements incentives for both electric vehicles and infrastructure. It would extend tax credits for residential and commercial electric vehicle infrastructure that is set to expire. Information about this bill can be found at http://thomas.loc.gov/cgi-bin/query/z?c112:H.R.1685.IH:

[36] U.S. Energy Information Administration, "Electric Power Monthly," July 2012, available at http://www.eia.gov/electricity/monthly/current_year/july2012.pdf.

[37] American Wind Energy Association, "American wind power reaches 50-gigawatt milestone," Press release, August 7, 2012, available at http://www.awea.org/newsroom/pressreleases/50_GW_milestone.cfm/.

[38] Ibid.

[39] U.S. Department of Energy, "20% Wind Energy by 2030," December 2008, available at http://www1.eere.energy.gov/wind/pdfs/42864.pdf.

[40] Solar Energy Industries Association, "U.S. Solar Market Insight," September 7, 2012, available at http://www.slideshare.net/SEIA/us-solar-market-insight-report-q2-2012.

[41] U.S. Energy Information Administration, "Electric Power Monthly."

[42] Kenneth Bosson, "Renewable Energy Sees Explosive Growth During Obama Administration," Renewable Energy World.com, August 29, 2012, available at http://www.renewableenergyworld.com/rea/news/article/2012/08/renewable-energy-sees-explosive-growth-during-obama-administration.

[43] Stephen Lacey, "Wind Manufacturer Plans 165 Layoffs in Pennsylvania due to Congressional Inaction on Key Tax Credit."

[44] Nick Juliano, "Reid hopes for pre-election extenders vote; Republicans say it's unlikely," *E&ENews*, September 11, 2012, available at http://www.eenews.net/eenewspm/2012/09/11/3.

[45] Joe Romm, "Clean Energy Stunner: Renewable Power Tops Fossil Fuels for First Time," *Climate Progress*, November 26, 2011, available at http://thinkprogress.org/climate/2011/11/26/376250/clean-energy-renewable-power-tops-fossil-fuels-for-first-time/.

[46] Jack Perkowski, "China Leads The World In Renewable Energy Investment," *Forbes*, July 27, 2012, available at http://www.forbes.com/sites/jackperkowski/2012/07/27/chinaleads-the-world-in-renewable-energy-investment/.

[47] Tom Steyer and John Podesta, "We Don't Need More Foreign Oil and Gas," *The Wall Street Journal*, January 24, 2012, available at http://online.wsj.com/article/SB10001424052970203718504577178872638705902.html.

[48] Chris Cottrell, "German renewables output hits record high in H1," *Reuters*, July 26, 2012, available at http://www.reuters.com/article/2012/07/26/germany-renewables-idUSL6E8IQIA720120726.

[49] Richard Caperton and Matt Kasper, "The Romney-Ryan Ticket: Ceding the Energy Future," (Washington: Center for American Progress Action Fund, 2012) available at: http://www.americanprogressaction.org/wp-content/uploads/2012/09/RomneyUEnergyInvestments-2.pdf.

[50] U.S. Energy Information Administration, "Sales of Fossil Fuels Produced from Federal and Indian Lands, FY 2003 through FY 2011," March 2012, available at http://energy.gov/sites/prod/files/eia-federallandsales.pdf.

[51] Marc Humphries, "U.S. Crude Oil Production in Federal and Non-Federal Areas," (Washington: Congressional Research Service, 2012) available at http://www.eenews.net/assets/2012/04/03/document_gw_01.pdf.

[52] Emily Pickrell, "Gulf of Mexico deep-water rigs likely to reach record by 2014," *FuelFix*, July 30, 2012, available at http://fuelfix.com/blog/2012/07/30/gulf-of-mexico-deep-water-rigs-likely-to-reach-record-by-2014/.

[53] U.S. Department of the Interior, "Oil and Gas Lease Utilization, Onshore and Offshore, Updated Report to the President," May 2012, available at http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&pageid=296238.

[54] The Press Association, "Eventful Meeting for BP's Losses," *The Guardian*, April 11, 2012, available at http://www.guardian.co.uk/uk/feedarticle/10192214.

[55] The U.S. Bureau of Land Management, "Federal Land Policy and Management Act," available at http://www.blm.gov/flpma/ (last accessed September 12, 2012).

[56] U.S. Department of the Interior, "Oil and Gas Lease Utilization, Onshore and Offshore, Updated Report to the President."

[57] Eric Lipton, "Drillers in Utah Have a Friend in a U.S. Land Agency," *The New York Times*, July 27, 2012, available at http://www.nytimes.com/2012/07/28/us/politics/bureau-of-land-managements-divided-mission.html?_r=1&pagewanted=all.

[58] CBC News, "Breaking down the prices of gasoline," April 4, 2012, available at http://www.cbc.ca/news/canada/story/2012/04/04/f-gas-prices-explainer.html.

[59] Rex Nutting, "Gingrich's Gaseous Argument," *The Wall Street Journal*, March 10, 2012, available at http://online.wsj.com/article/SB10001424052970204781804577267690888223980.html?grcc=d3ac29ddb30893064f601ae86aa5b960Z9&mod=WSJ_hps_sections_personalfinance.

[60] "More U.S. drilling didn't drop gas prices," *Associated Press*, March 21, 2012, available at http://www.mysanantonio.com/business/article/No-dip-in-price-with-more-drilling-3425467.php.

[61] Peter Van Doren and Jerry Taylor, "It's not Obama's Fault that Crude Oil Prices have Increased," *The Cato Institute,* March 2, 2012, available at http://www.cato.org/publications/commentary/its-not-obamas-fault-crude-oil-prices-have-increased.

[62] Jessica Goad, "Gov. Romney and Rep. Ryan Want to Drill, Slash, and Sell Our Nation's Public Lands" (Center for American Progress Action Fund, September 2012).

[63] Bob Marshall, "Conservation Update: Romney Energy Plan Would Give Drilling Control on Federal Lands to States," The Conservationist blog, August 24, 2012, available at http://www.fieldandstream.com/blogs/conservationist/2012/08/conservation-update-romney-energy-plan-would-givedrilling-control-fed.

[64] Phil Taylor, "Contractors group critical of Romney plan to hand permitting to states," *E&E News*, September 11, 2012, available at http://www.eenews.net/Greenwire/2012/09/11/2.

[65] Cory Nealon, "Defense Department Opposes Most Offshore Drilling in Virginia," *The Daily Press*, May 18, 2010, available at http://articles.dailypress.com/2010-05-18/news/dp-nws-navy-drilling-20100518_1_drilling-offshore-mexico-oil-spill.

[66] Ibid.

[67] Ibid.

[68] Randal Yakey, "Federal agency hears concerns about Gulf oil drilling," *Panama City News Herald*, April 4, 2012, available at http://www.newsherald.com/articles/drilling-101686-federal-agency.html

[69] Congressional Budget Office, "Potential Budgetary Effects of Immediately Opening Most Federal Lands to Oil and Gas Leasing," August 9, 2012, available at http://www.cbo.gov/sites/default/files/cbofiles/attachments/08-09-12_Oil-and-Gas_Leasing.pdf.

[70] Kathy Castor, "Castor Files Amendment to Transportation Bill to Protect Jobs and Florida's Economy," Press release, February 14, 2012, available at http://castor.house.gov/news/documentsingle.aspx?DocumentID=280415.

[71] The Outer Banks Chamber of Commerce, "Outer Banks, North Carolina Vacation Info" available at http://www.outerbankschamber.com/main/outer-banks-north-carolina-vacation-info/ (last accessed August 2012).

[72] Congressional Budget Office, "Potential Budgetary Effects of Immediately Opening Most Federal Lands to Oil and Gas Leasing."

[73] Energy Information Administration, "Impact of Increased Access to Oil and Natural Gas Reserves in the Lower 48 Federal Outer Continental Shelf," available at http://www.eia.gov/oiaf/aeo/otheranalysis/ongr.html (last accessed September 12, 2012).

[74] U.S. Energy Information Administration, "*Analysis of Crude Oil Production in the Arctic National Wildlife Refuge*," May 2008, available at http://www.eia.gov/oiaf/servicerpt/anwr/pdf/sroiaf(2008)03.pdf.

[75] Anne Mulkern, "As high gas prices loom, new Congress faces pressure on drilling," *Greenwire News*, January 4, 2011, available at http://www.eenews.net/Greenwire/2011/01/04/archive/2?terms=ken+green.

[77] Letter from the United States Environmental Protection Agency to Jose W. Fernandez and Kerri-Ann Jones, U.S. Department of State, June 6, 2011.

[78] Energy Information Administration, "Diesel Fuel Explained," April 13, 2012, available at http://www.eia.gov/energyexplained/index.cfm?page=diesel_prices.

[79] Anthony Swift, "Keystone XL: A Tar Sands Pipeline to Increase Oil Prices," (Washington: Natural Resources Defense Council, 2012).

[80] "Video: Markey questions if Keystone will really aid in US economic, national security," Energy and Commerce Subcommittee hearing, December 2, 2011, available at http://www.youtube.com/watch?v=VucRPHJtvGU.

[81] Daniel Weiss, "Why the 'Keystone Vision' is an Economic Mirage," February 22, 2012, available at: http://thinkprogress.org/climate/2012/02/22/429981/keystone-vision-economic-mirage/.

[82] Ensys Energy, "Keystone XL Assessment," The U.S. Department of Energy Office of Policy and International Affairs, December 23, 2010, available at http://keystonepipeline-xl.state.gov/documents/organization/182421.pdf.

[83] Ibid.

[84] Bradley Olsen, "Keystone Oil Pipeline Seen Raising Gas Prices in Midwest: Energy," *Bloomberg*, February 29, 2012, available at http://www.bloomberg.com/news/2012-03-01/keystone-oil-pipeline-seen-raising-gas-prices-in-midwest-energy.html.

[85] The Wilderness Society, "Making the Grade: Oil and Gas Drilling Report Card," July 24, 2012, available at http://wilderness.org/resource/making-grade-oil-and-gas-drilling-report-card.

[86] U.S. Department of the Interior, "Oil and Gas Lease Utilization, Onshore and Offshore," May 2012, available at http://www.doi.gov/news/pressreleases/upload/Final-Report.pdf.

[87] Ibid.

[88] The Wilderness Society, "Making the Grade: Oil and Gas Drilling Report Card."

[89] Ibid.

[90] U.S. Department of the Interior, "Oil and Gas Lease Utilization, Onshore and Offshore."

[91] The Wilderness Society, "Making the Grade: Oil and Gas Drilling Report Card."

[92] U.S. Energy Information Administration, "Sales of Fossil Fuels Produced from Federal and Indian Lands, FY 2003 through FY 2011."

[93] The Wilderness Society, "Making the Grade: Oil and Gas Drilling Report Card."

[94] Associated Press, "Drillers cut natural gas production as prices drop," *The Wall Street Journal*, February 12, 2012, available at http://online.wsj.com/article/AP3e0b9812cd1c44829710ea9dba98efec.html.

[95] Daniel Weiss, "Tapping America's Unconventional Oil Resources for Job Creation and Affordable Domestic Energy: Technology and Policy Pathways," Testimony before the House Committee on Science, Space and Technology, April 17, 2012, available at http://www.americanprogressaction.org/wp-content/uploads/issues/2012/04/pdf/weiss_testimony.pdf.

[96] The Joint Committee on Taxation, *Estimated Budget Effects of S.2204, The "Repeal of Big Oil Tax Subsidies Act"* (March 23, 2012).

[97] Seth Hanlon, "Big Oil's Misbegotten Tax Gusher" (Washington: Center for American Progress, 2011).

[98] Richard Rubin, "Continental's Hamm Says U.S. Must Keep Tax Breaks for Oil," *BusinessWeek*, June 12, 2012, available at http://www.businessweek.com/news/2012-06-12/continental-s-hamm-says-u-dot-s-dot-must-keep-tax-breaks-for-oil-gas.

[99] Daniel J. Weiss and Jackie Weidman, "Is Big Oil Rigging Gasoline Prices?" (Washington: Center for American Progress, 2012).

[100] Natural Resource Committee Democratic Staff, *Profits and Pink Slips: New Report Details How Big Oil is Cutting Jobs, Not Creating Them* (Government Printing Office, 2011).

[101] House Budget Committee, *The Path to Prosperity: A Blueprint for American Renewal* (Government Printing Office, 2012).

[102] Zack Colman, "Democrats say Romney beholden to 'Big Oil,'" *The Hill*, July 26, 2012, available at http://thehill.com/blogs/e2-wire/e2-wire/240523-democrats-liberal-group-attack-romney-gop-on-oil-subsidies.

[103] CNN Money, "Fortune 500," *CNN*, May 21, 2012, available at http://money.cnn.com/magazines/fortune/fortune500/2012/full_list/.

[104] Kim Dixon, "Analysis: Gas price spike revives fight over energy taxes," *Reuters*, March 26, 2012, available at http://www.reuters.com/article/2012/03/26/us-usa-tax-bigoil-idUSBRE82P0DX20120326.

[105] Ibid.

Mr. WHITFIELD. Thank you, Mr. Weiss.

Mr. Purcell, you are recognized for 5 minutes.

STATEMENT OF JOHN PURCELL

Mr. PURCELL. Thank you, Chairman Whitfield, Ranking Member Rush and subcommittee members. My name is John Purcell and I serve as Vice President of Wind Energy for Leeco Steel. I appreciate the opportunity to speak briefly today about America's wind power contribution to a secure and affordable national energy portfolio. I would especially like to focus on the impact on Leeco Steel and the U.S. wind energy due to the impending expiration of the renewable energy production tax credit, the PTC.

We at Leeco Steel feel it is imperative for the PTC to be extended in its full form as soon as possible as included in the Family and Business Tax Cut Certainty Act that was passed on a strong bipartisan basis by the Senate Finance Committee by a vote of 19 to 5.

Leeco Steel is a wholly owned subsidy of O'Neal Steel, the largest privately held metals distribution company in the United States. Headquartered in Lisle, a western suburb of Chicago, Leeco Steel is a carbon, high-strength low-alloy steel plate distributor and processor serving the United States, Mexico and South America from seven locations throughout these regions. We have distribution facilities in Portage, Indiana; Oshkosh, Wisconsin; Pittsburgh, Pennsylvania; Chattanooga, Tennessee, and Fort Worth, Texas.

Leeco Steel first began delivering steel plates and fabricated plate products to the wind industry in 2004. Revenue from the wind industry now accounts for nearly 40 percent of our company's revenues. The wind business for Leeco has become a keystone of our overall business and a driver for development of our company overall.

Leeco Steel has provided over 500,000 tons of steel plates to 12 tower manufacturing facilities in 12 States across the United States, 500,000 tons of steel in the last 6 years that didn't exist to a market that didn't exist before 2004 for us, most of which has been built in the last 8 years. The PTC has helped us to expand our company in the wind industry and into new markets, and has helped us weather the recent economic downturn. Since the early development of our wind business, we have hired over 70 people at my company to help maintain the growth strategies that we have planned for our company.

In the past 6 years, when there has been certainty of a PTC, our wind business and the wind industry overall have been important drivers of economic growth. Of the 12 tower factories mentioned above, 10 of those factories did not exist before 2002. Taking an average of 250 employees per factory, that is 2,500 new, good-paying jobs that were created in a very short amount of time within our supply chain alone. This does not take into account the thousands of additional jobs that exist in the supply chain that supplies goods and services to each of these 12 factories.

Because of the PTC, the U.S. wind industry has seen tremendous growth and innovation and has become an American success story. Overall, wind energy capacity has grown to over 50 gigawatts, which is enough energy to power over 13 million American homes. Iowa and South Dakota now get roughly 20 percent of their elec-

tricity from wind generation alone. The wind industry has generated investment upward of $20 billion annually and created 75,000 jobs. Since the PTC was last allowed to expire, there was approximately only 25 percent domestic content in each wind turbine that was erected, on average. Today, the average is over 65 percent domestic content in each installed turbine. And wind power is more affordable than ever, with costs falling 90 percent since the 1980s to 5 to 7 cents per kilowatt-hour today.

With such a positive impact on communities across the country, it is no surprise that the PTC has enjoyed widespread, bipartisan support. One example of this support can be seen in the list of 113 cosponsors, including 27 Republicans, of H.R. 3307, a bill that would extend the PTC through 2016. Another PTC extension bill on the Senate side, S. 2201, was introduced on a bipartisan basis and there is strong support by both Republican and Democratic governors as well for a PTC extension.

With the PTC extension uncertainty, many of Leeco's expansion plans are at risk. There have been high-level discussions to increase the amount of steel plate capacity for the wind business in the coming few years. However, those discussions have now gone silent, as there needs to be business case certainty to move forward with such huge capital investments.

In similar fashion, over the years many plans to increase wind tower production in the United States have been scrapped due to the uncertainty caused by the on again-off again nature of the PTC. As a result, the wind industry as a whole is already seeing massive layoffs. Many plans to add to existing facilities or invest in new facilities are on indefinite hold or again have been scrapped altogether. Industry-wide, 37,000 jobs will be lost if the PTC is not extended immediately.

It is my opinion that the supply chain was built for the wind industry, and billions of dollars were invested in it, because companies expected a long-term PTC that would allow for stable growth in the wind business for many years to come. Major factories have been established from coast to coast, and many North American headquarters have been established in cities such as Portland, Chicago and Denver. Without an extension of the PTC, all of these assets are at a premium risk of being shuttered or downsized dramatically.

With an immediate extension of the PTC, the development and construction of these turbines can continue as planned. The tens of thousands of jobs that can be created with this extension will allow the wind industry to not only continue being a leader in job creation, but help secure our Nation's energy future by diversifying America's energy mix and locking in stable power prices over a long timeframe. The PTC is also crucial for regaining our Nation's leadership in new technology and innovation that will keep our economy competitive. The wind industry is on the verge of becoming competitive without the PTC, but failing to extend it immediately would prevent us from finishing the job.

Again, thank you for the opportunity to be here today. I look forward to answering your questions. Thank you.

[The prepared statement of Mr. Purcell follows:]

Testimony of John Purcell, Leeco Steel
House Committee on Energy and Commerce
Subcommittee on Energy and Power
Hearing on the American Energy Initiative
September 13, 2012

Thank you, Chairman Whitfield, Ranking Member Rush, and Subcommittee Members. My name is John Purcell and I serve as Vice President of Wind Energy for Leeco Steel. I appreciate the opportunity to speak briefly today about American wind power's contribution to a secure and affordable national energy portfolio. I would especially like to focus on the impact on Leeco Steel and the U.S. wind energy sector due to the impending expiration of the Renewable Energy Production Tax Credit (PTC). We at Leeco Steel feel it is imperative for the PTC to be extended in its full form as soon as possible as included in the Family and Business Tax Cut Certainty Act that was passed on a strong bipartisan basis by the Senate Finance Committee by a vote of 19-5.

Leeco Steel is a wholly owned subsidiary of O'Neal Steel, the largest privately held metals distribution company in the United States. Headquartered in Lisle, IL, a western suburb of Chicago, Leeco Steel is a carbon, high-strength low-alloy steel plate distributor and processor serving the United States, Mexico and South America from seven locations throughout these regions. We have distribution facilities in Portage, IN, Oshkosh, WI, Pittsburgh, PA, Chattanooga, TN, and Fort Worth, TX.

Leeco Steel first began delivering steel plates and fabricated plate products to the wind industry in 2004. Revenue from the wind industry now accounts for nearly

40% of our company's total revenue. The wind business for Leeco has become a keystone of our overall business and a driver for development of our company. Leeco Steel has provided hundreds of thousands of tons of steel plates to 12 tower manufacturing facilities in 12 states across America, most of which have been built in the past eight years. The PTC has helped us to expand our company in the wind industry and into new markets, and has helped us weather the recent economic downturn. Since the early development of our wind business, we have hired over 70 people at Leeco Steel to help maintain the growth strategies that we have planned for our company.

In the past six years, when there has been certainty of a PTC, our wind business and the wind industry overall have been important drivers of economic growth. Of the 12 tower factories mentioned above, 10 of those factories did not exist before 2002. Taking an average of 250 employees per factory, that is 2,500 new, good paying jobs that were created in a very short amount of time within our supply chain alone. This does not take into account the thousands of additional jobs that exist in the supply chain that supplies goods and services to each of these 12 factories.

Because of the PTC, the U.S. wind industry has seen tremendous growth and innovation and has become an American success story. Overall, wind energy capacity has grown to over 50 gigawatts, which is enough energy to power over 13 million American homes. Iowa and South Dakota now get roughly 20% of their electricity from wind generation alone. The wind industry has generated

investment upward of $20 billion annually and created 75,000 jobs. Since the PTC was last allowed to expire, there was approximately only 25% domestic content in each wind turbine that was erected, on average. Today, the average is over 65% domestic content in each installed turbine. And wind power is more affordable than ever, with costs falling 90% since the 1980s to 5-7 cents per kilowatt-hour today.

With such a positive impact on communities across the country, it is no surprise that the PTC has enjoyed widespread, bipartisan support. One example of this support can be seen in the list of 113 co-sponsors, including 27 Republicans, of H.R. 3307, a bill that would extend the PTC through 2016. Another PTC extension bill on the Senate side, S. 2201, was introduced on a bipartisan basis and there is strong support by both Republican and Democratic governors for a PTC extension.

With the PTC extension uncertainty, many of Leeco's expansion plans are at risk. There have been high level discussions to increase the amount of steel plate capacity for the wind business in the coming few years. However, those discussions have now gone silent, as there needs to be business case certainty to move forward with such huge capital investments.

In similar fashion, over the years many plans to increase wind tower production in the U.S. have been scrapped due to the uncertainty caused by the on again/off again nature of the PTC. As a result, the wind industry as a whole is already seeing layoffs. Many plans to add to existing facilities, or invest in new facilities, are on indefinite

hold or have been scrapped altogether. Industry-wide, 37,000 jobs will be lost if the PTC is not extended.

It is my opinion that the supply chain was built for the wind industry, and billions of dollars were invested in it, because companies expected a long-term PTC that would allow for stable growth in the wind business for many years to come. Major factories have been established from coast to coast, and many North American headquarters have been established in cities such as Chicago, Portland, OR, and Denver. Without an extension of the PTC, all of these assets are at a premium risk of being shuttered or downsized dramatically.

With an immediate extension of the PTC, the development and construction of these turbines can continue as planned. The tens of thousands of jobs that can be created with this extension will allow the wind industry to not only continue being a leader in job creation, but help secure our nation's energy future by diversifying America's energy mix and locking in stable power prices over a long timeframe. The PTC is also crucial for regaining our nation's leadership in new technology and innovation that will keep our economy competitive. The wind industry is on the verge of becoming competitive without the PTC, but failing to extend it immediately would prevent us from finishing the job.

Again, thank you for the opportunity to be here today. I look forward to answering your questions.

Mr. WHITFIELD. Thank you, Mr. Purcell.

Mr. Mills, you are recognized for 5 minutes.

STATEMENT OF MARK P. MILLS

Mr. MILLS. Thank you, Mr. Chairman, and thank you to the committee for the opportunity and the honor of testifying before you today.

As you know, I am Mark Mills, a Senior Fellow with the Manhattan Institute. I have spent almost all of my career as a technologist, as a practitioner, an analyst and fundamentally in recent decades a forecaster of technologies.

We are at an interesting turning point technologically in the energy arena that no one expected us to arrive at at any time in the last five decades. But let me put into context, if I may, the idea of energy independence that we have been talking about since 1973 from the first Arab oil embargo.

The idea of energy independence is not one of isolationism for the United States. I would suggest that we consider independence in the same context as we are interdependent of food and agriculture. The United States is the single largest supplier of grains to the world. We provide 40 percent of the world's trade in grains. That provides America with all of the associated revenue benefits, trade, jobs benefits. It is of enormous value to this country.

Technology is now doing for the American energy and fuel sector what happened to the agricultural sector. It is a revolution of profound proportions and suggests something that can be done that we have never considered for decades. It is a complete reversal of the energy paradigms that were put in place in foreign policies for the last four decades. These are paradigms that everybody knows were based on the idea of shortages and limits and rising imports. We can now think realistically, as you have heard from a number of the witnesses this morning, we can think realistically not just in terms of dramatic continual increase on hydrocarbon production in the United States. We could accelerate and incent that and become a net energy exporter to the world and become within less than two decades, probably within a decade, the world's largest supplier of hydrocarbons and fuels, just as we are now the world's largest supplier of food.

You have already heard from a number of witnesses, and there are at least a half dozen excellent reports including that from Citi and Raymond James that point out that we are in that context on track to generating millions of jobs from this kind of trajectory and probably trillions of dollars of net economic benefit to our economy. All these analyses have been done in the context of business as usual. If we leave the industry alone, it will continue to generate these benefits. I would like to suggest this morning that that is not adequate to the times. It is not adequate to the task or the opportunity. I know that we have in the general political discourse made fun of the idea of "drill, baby, drill" but it is a practical reality that the infrastructure of the hydrocarbon industry is now capable of generating more jobs, more economic benefits to the U.S. economy than any single activity we could incent in the entire economy. We could literally drill, but I would expand this to drill, dig, build and ship our way out of the economic and jobs crisis that we are in

right now by recognizing the technological and resource realities that are now in place.

No one expected this any time in the last 40 years. Nobody expected this even 5 years ago. The reality here of course is that this comes at a terrific time for the United States. We are no longer the primary energy consumer of the world and no increase in energy demand. In fact, most likely zero energy demand growth occurs in the United States over the next decade, net demand growth. All of the net energy demand growth in the world is occurring outside of the United States, which is a complete reversal of where we were in the 1970s. The world will add to its demand over the next two decades the equivalent of adding two United States' worth of energy demand and it will occur without regard to anything that occurs in the United States within our borders or in North America.

We now have the opportunity to help fuel that hungry world. Eighty-five percent of the world's energy is currently in hydrocarbons. In a sense, all of the or a majority of all the growth in demand will come from hydrocarbons over the next two decades. There is a very significant role for non-hydrocarbons but the majority will be hydrocarbons.

So the United States is sitting here at an interesting turning point. We could see this enormous opportunity to produce and fuel the world and generate millions of jobs in America and generate trillions of dollars of net economic benefit or we could choose not to do so. I would suggest that the issue that should be considered is not how do we not impede the industry from continuing to bring this very happy circumstance of becoming the world's fastest-growing hydrocarbon province. How do we accelerate that? How do we accelerate those economic benefits, the benefits to the world, to our economy and fundamentally reset the geopolitics of the energy economy for the entire world?

Thank you, Mr. Chairman.

[The prepared statement of Mr. Mills follows:]

Liberating the Energy Economy: What Washington Must Do

Testimony by
Mark P. Mills, Senior Fellow, Manhattan Institute
Before
Committee on Energy and Commerce
Subcommittee on Energy and Power Hearing on
"The American Energy Initiative"
September 13, 2012
Washington D.C.

The United States is the largest single supplier of grains, accounting for about 40 percent of global exports. We enjoy the associated trade, jobs, and revenue benefits that come from being the world's breadbasket.

Technology is now doing for the American energy and fuel sectors what it previously did for the agricultural sector. In a complete reversal of the widely accepted energy paradigms of declining domestic hydrocarbon production, dependence, and shortage, it is now realistic for America not just to feed the world, but to fuel it as well.

Last year the United States exported almost $140 billion in agricultural goods -- and about $120 billion in hydrocarbons. Within a year or so, we will likely export more fuel and petroleum products than food. Shortly after that, hydrocarbon exports will exceed those from information technology equipment, and then quickly exceed automotive sector exports. This is only the beginning of what is possible.

Policies that accelerate hydrocarbon production could create at least 3 million jobs and $3 to $7 trillion worth of economic benefits, and would completely reset energy geopolitics. I have outlined the staggering magnitude of the jobs and economic benefits in a Manhattan Institute report this past summer titled *Unleashing the Energy Colossus*, work that expands on similar bullish analyses from organizations like Citi bank, Wood McKenzie, HIS CERA, Deloitte, and industry insiders like Bentek Energy.

The United States can, quite literally, drill, dig, build, and ship its way out of the current economic and jobs malaise. But we can do so only if the nation adopts new energy policies that reflect the technological, economic, and demographic realities of 2012.

Surprising all the experts, the United States has reversed a 40-year decline in oil output, and has become the world's fastest growing hydrocarbon region. Recently, the United States became a net exporter of petroleum products for the first time since 1949. The same technology revolution has generated a flood of natural gas and rush of applications to export it. It has driven coal exports to record levels as well.

And, this past August, the U.S. Energy Information Administration (EIA) released a summary of the nation's "proven reserves" of oil and natural gas, recording the highest increase in the 35 years since the EIA began publishing estimates.

For all this, thank technologists and engineers, and thousands of small, independent producers. This growth in energy abundance occurred without policies intended to encourage it, and it has happened almost entirely on private and state, not federal lands.

The new reality of hydrocarbon abundance makes possible not only energy independence, but also a credible scenario in which the Middle East is displaced as the world's primary energy exporter. Hydrocarbons currently supply 85 percent of the world's energy and every forecast sees them as central for the foreseeable future. Essentially all growth in global energy demand is now outside of the United States.

When asked what constrains expansion, businesses across the country universally cite the crushing weight of the existing regulatory system. Policies and regulations have evolved unintentionally to become complex, over-reaching, and often capricious. Regulations are suppressing American energy productivity.

Surely in the information age, we can bring to bear the power of technology to enhance the efficiency and transparency of the regulatory infrastructure itself, while preserving the intent and purpose of legislation. We can do this, and with the specific goal of not overburdening either the regulated or the regulators.

To unleash the enormous benefits from expanding hydrocarbon production and exports, the next president and Congress need to first step above the myriad proposals and make over-arching and sweeping changes. We should:

1. Pass omnibus energy legislation that is both pro-development and pro- export, and that emulates the philosophy underpinning the North American Free Trade Agreement (NAFTA).

2. Establish a single federal portal for approval of all major energy projects, rather than subject applicants to multiple and sometimes conflicting or duplicative and time-consuming processes across multiple agencies.

3. Declare a time-out on all new federal regulations. Given the crushing burden of 40 years of regulatory expansion, there should be an across-the-board suspension of implementation of all new rules, with the exception of those with near-term safety relevance. An interagency task force should explore how to use twenty-first century information techniques to make sense out of the morass, enable sensible cost-benefit analyses, and provide transparency and efficiency for citizens and businesses.

America is in the middle of an appalling jobs crisis. Dramatically increasing the production of domestic hydrocarbons—oil, natural gas, and coal—offers the single biggest opportunity to generate jobs, especially those in the hard-hit middle class, and create truly amazing collateral financial benefits to state and federal treasuries.

Not in nearly a half century has the energy "ground game" changed so radically. But capturing these opportunities requires bold policies. This energy future isn't inevitable. The United States could by default walk away from all these jobs, and revenues, and pass up the chance to become the major player in world energy markets. Should this happen, other nations will step in to fill the void.

Mr. WHITFIELD. Thank you, Mr. Mills.

Mr. Howard, you are recognized for 5 minutes.

STATEMENT OF PETER HOWARD

Mr. HOWARD. Thank you, Mr. Chairman. My name is Peter Howard, and I am President and CEO of the Canadian Energy Research Institute located in Calgary, Alberta, Canada.

The Canadian Energy Research Institute is an independent not-for-profit research institute specializing in the energy economics of energy production, transportation and consumption sectors. The central goal of CERI is to bring the insights of scientific research, economic analysis and practical experience to the attention of government policymakers, business-sector decision-makers, the media and the general public. CERI is funded by the government of Canada, the government of the Province of Alberta, the Canadian Association of Petroleum Producers, and the Small Explorers and Producers Association.

CERI has published several reports that deal with the economic analysis and short- to medium-term forecasts of hydrocarbon production from the Canadian provinces and territories including conventional oil, conventional gas, coalbed methane, unconventional gas, oil sands, LNG and natural-gas liquids. These reports are available on CERI's Web site and are the basis of my comments today.

With respect to liquid hydrocarbons, in 2011 Canada's average daily production was made up of the following. From western Canada, light crude was 562,000 barrels; condensate, 128,000; conventional heavy, 422,000; upgrade bitumen, or SCO, at 846,000; non-upgraded bitumen at 759,000; and from eastern Canada, primarily Newfoundland, conventional light at 272,000 for a total of 2,989,000 barrels per day average. In 2011, Canada's average daily exports was 2,138,000, of which 98 percent of those volumes went to the United States.

Canada's conventional-oil production, light and heavy, peaked in the mid-1970s at 2.2 million barrels per day and has been on a steady decline since that point in time until very recently. In 2010 and 2011, the year-over-year production rate actually increased. The reason: applying horizontal drilling technology to old oil fields to access bypassed oil and increase the recoverable oil percentage. During those years the number of oil-directed wells increased from 1,647 wells in 2008 to 4,339 wells in 2011 with horizontal wells being 60 percent of the total. CERI's conventional-oil model is forecasting a conservative increase in conventional oil of 200,000 barrels per day by 2015 and an optimistic increase of 300,000 barrels.

The Alberta oil sands currently produce, on average, 1.681 million barrels per day with 60 percent sourced from mining operations and 40 percent from in situ operations. Production ramp-ups and de-bottlenecking efforts over the next 2 years will expand production to 2.2 barrels per day. An additional 408,000 barrels per day is scheduled to be connected from projects that are currently under construction and due on stream in and about 2015. Additional volumes of 1.3 million barrels per day and another 1.3 million barrels per day on top of that either have the regulatory approval or are awaiting for their regulatory approval. And on top of

all that, there is a further 1 million barrels per day from projects that have been announced that have not gone before the regulator. Total potential from the oil sands is around 5.3 million barrels per day. In other words, there is 2–1/2 million barrels, or five pipelines, of production that is considered land-locked and is looking for a pathway to either an existing market or a new market.

The current export capacity of pipelines from the WCSB from an operational point of view is 3.45 million barrels per day. Add to this, two projects that Enbridge Pipelines is currently undertaking to increase capacity on line 67 and 61 totaling 200,000 barrels per day. Total export capacity by 2015 and forward will be around 3.65 million barrels per day.

In 2012, the Trans Mountain Pipeline System connecting Alberta to Vancouver was 60 percent oversubscribed. By 2016, CERI is forecasting that the export pipelines connecting Alberta to the United States will be approaching an oversubscribed situation. Some possible relief from the railways is envisaged by transporting upwards of 200,000 barrels per day to market which would shift that point to about 2018.

There are three possible pipeline projects that are on the books to be constructed: the Keystone XL, the Trans Mountain Expansion and the Northern Gateway. In addition to those, there are three other proposals. The first one is Enbridge's line 9 to reverse that and change the flow direction Sarnia, Ontario, to Montreal, Quebec. Total volume will be 240,000 barrels per day, and this would be conventional crude sourced out of Alberta and Saskatchewan. TransCanada has also proposed converting one of their Canadian mainline gas pipelines over to oil and bitumen service. This would connect western Canada to all the eastern Canada refineries, including the Irving refinery in New Brunswick.

The port of Churchill, Manitoba, is currently ice-free for 9 months of the year and this is being investigated as a potential pipeline connection and tanker port.

I see that my time has come up, so I will belay my comments with regard to natural gas and cede to the chairman. Thank you.

[The prepared statement of Mr. Howard follows:]

Presentation to the

Congress of the United States
House of Representatives
Committee on Energy and Commerce

Subcommittee on Energy and Power Hearing
"The American Energy Initiative"

Peter Howard, President and CEO
Canadian Energy Research Institute

September 13, 2012

Good Morning. My name is Peter Howard and I am the President and CEO of the Canadian Energy Research Institute (CERI) located in Calgary, Alberta, Canada.

The Canadian Energy Research Institute is an independent not for profit research institute specializing in the analysis of energy economics in the energy production, transportation and consumption sectors. The central goal of CERI is to bring the insights of scientific research, economic analysis and practical experience to the attention of government policy-makers, business sector decision-makers, the media and the general public. CERI is funded by the Government of Canada, the Government of the Province of Alberta, the Canadian Association of Petroleum Producers (CAPP) and the Small Explorers and Producers Association (SEPAC).

CERI has published several reports that deal with the economic analysis and short- to medium-term forecasts of hydrocarbon production from the Canadian Provinces and Territories including conventional oil, conventional gas, coalbed methane, unconventional gas, oil sands, LNG, and natural gas liquids (NGLs). These reports are available on CERI's website and are the basis of my comments today.

With respect to liquid hydrocarbons, in 2011 Canada's average daily production was:

From Western Canada:	
• Conventional Light Crude	562,000 bbls/day
• Condensate (C5+)	128,000 bbls/day
• Conventional Heavy Crude	422,000 bbls/day
• Upgraded Bitumen (SCO)	846,000 bbls/day
• Non-Upgraded Bitumen	759,000 bbls/day
From Eastern Canada:	
• Conventional Light Crude	272,000 bbls/day
Total	**2,989,000 bbls/day**

In 2011 Canada's average daily exports were 2,138,000 bbls per day with 98% of those volumes going to the United States.

CONVENTIONAL OIL AND OIL SANDS

Canada's conventional oil production (light and heavy) peaked in the mid-70s at 2,200,000 bbls/day and has been on a steady decline since that point in time until recently. In 2010/2011 the year over year production rate increased. The reason: applying horizontal drilling technology to old oil fields to access bypassed oil and increase the recoverable oil percentage. During those years the number of oil directed wells increased from 1,647 wells in 2008 to 3,109 in 2010 and 4,339 in 2011 with horizontal wells accounting for 60% of the total. CERI's conventional oil model is forecasting a conservative increase in conventional oil of 200,000 bbls/day by 2015 and an optimistic increase of 300,000 bbls/day.

The Alberta oil sands currently produce, on average, 1,618,000 bbls/day (2011) with 60% sourced from mining operations and 40% from in situ operations. Production ramp-ups and debottlenecking efforts over the next 2 years will expand production to 2,200,000. By 2013, an additional 408,000 bbls/day is scheduled to be connected from projects that are currently under construction and due on stream prior to 2015. Additional volumes of 1,300,000 bbls/day have been approved by the regulator and are awaiting start of construction. Also, there is another 1,300,000 bbls/day from projects that are waiting for approval by the regulator and a further 1,000,000 bbls/day from projects that have been announced. Total potential from the oil sands is 5,300,000 bbls/day. In other words, there is up to 2,500,000 bbls/day of oil sands production that is considered land-locked and is looking for a pathway to either an existing market or a new market.

The current capacity of the export pipelines from the WCSB from an operational point of view is 3,450,000 bbls/day. Add to this, two projects announced by Enbridge to increase the capacity of line 67 and 61 by an additional 200,000 bbls/day by 2014. Total export capacity in 2015 and forward will be 3,650,000 bbls/day.

In 2012, the Trans Mountain Pipeline System connecting Alberta to Vancouver was oversubscribed by 60% over the summer months. By 2016, CERI has forecasted that the export pipelines connecting Alberta to the United States will be approaching an oversubscribed situation. Some possible relief from the railways is envisaged by transporting upwards of 200,000 bbls/day to market which will shift the over subscription point to 2018.

New pipelines are needed.

The three pipeline projects that are on the books to be constructed, the Keystone XL, the Trans Mountain Expansion and the Northern Gateway have or are about to run into significant pushback from various entities all with no clear outcome. There are huge environmental concerns in British Columbia around Northern Gateway because the proposed pipeline will run through pristine rainforest and coast line and there is a perception that the environmental risk is greater than the economic benefits.

Several other options exist and are currently being investigated:

- Enbridge's line 9 has received approval to reverse its flow direction to move conventional crude from Sarnia, Ontario to Montreal. Total volume will be 240,000 bbls/day. The crude supply for this pipeline segment will come from Alberta, Saskatchewan and North Dakota.
- TransCanada Pipeline has proposed converting one of their Canadian mainline gas pipelines over to oil/bitumen service. This could connect western Canada with all the eastern Canada refineries, including the Irving refinery in New Brunswick. Bitumen volumes could reach Canadian refineries that can handle heavy crude along with access to the Atlantic basin by means of tanker or barge out of the Saint Lawrence Seaway.
- The port of Churchill, Manitoba is currently ice free for 9 months of the year and is being investigated as a potential pipeline connection and tanker port.

NATURAL GAS

Lack of pipelines is not the issue with respect to natural gas developments in western Canada, especially as it relates to connections to Ontario. We have too much spare capacity.

Low prices are pushing producers, and particularly Canadian exploration and development companies, towards mergers and potentially, bankruptcy. With persistent low prices and reduced market access as US production displaces Canadian gas in eastern markets, producers are experiencing negative returns. The current operating philosophy is, if revenue exceeds the variable operating cost, producers will produce with potential disastrous consequences down the road.

Rising demand in Alberta to support oil sands growth represents one alternative market opportunity. LNG exports offer another, longer-term opportunity although almost exclusively for British Columbia. The short-term challenge for many companies is to survive. How the short-term restructuring will affect the long term future of Canadian natural gas is uncertain.

Western Canada natural gas production peaked in 2008 at 17 billion cubic feet per day and since then has declined to the current level of 14 billion cubic feet per day as a direct result of declining market prices and a surge of domestic production within the continental US. CERI's Canadian gas forecast model is suggesting that gas production will continue to decline to 11 billion cubic feet per day excluding the Horn River and Montney gas production that is linked to LNG exports from Kitimat, British Columbia. Exports of Canadian gas to the US will decline from

a peak of 10 billion cubic feet per day in 2007 to 2 billion cubic feet per day by 2015 and remain at that level. Imports of US gas into eastern markets will grow to 4.5 billion cubic feet per day from the current volume of 1 billion cubic feet per day.

ECONOMIC IMPACTS

The capital investment required to support the on-stream and under construction oil sands projects amounts to $8.3 billion (2012-2014) with an additional $2 billion per year of operation. The economic impacts of JUST these projects over the period 2011-2035 are:

- Canadian GDP growth = $1,500 billion.
- United States GDP growth = $141 billion.
- Canadian direct employment in 2011 = 90,000 jobs (growing to 125,000 jobs)
- Canadian indirect and induced employment in 2011 = 183,000 jobs (growing to 254,000 jobs)
- United States indirect and induced employment = 1,568 thousand person years or 62,000 jobs

KEY MESSAGES

1. Western Canada conventional oil production is forecasted to increase by 200,000 to 300,000 barrels per day by 2016.
2. Western Canada oil sands production will grow from the current level of 1.6 million barrels per day to 2.2 million b/d by 2018 with an additional 2.5 million b/d waiting for pipeline/rail access to a market.
3. North, South, East or West, liquid hydrocarbon developments in Western Canada will need 5 new pipelines (500,000 bpd) over the next 15 years to reach its production potential.
4. Western Canada gas production is forecasted to decrease from the current 13 billion cubic feet per day to 11 billion cubic feet per day with net exports to the US declining from 10 billion cubic feet per day to 2 billion cubic feet per day by 2016.
5. The existing oils sands operations (operating and currently under construction) will generate $141 billion of GDP growth over the next 25 years and support, on an indirect and induced basis, 62,000 jobs per year.
6. New oil sands projects will significantly add to the economic impacts not only in Canada but also in the United States.

Mr. WHITFIELD. Mr. Howard, thanks very much, and I want to thank all of you for your testimony. The testimony was quite enlightening, and when you think about a few years ago, as has been said, we all were sort of wringing our hands about being able to meet the energy demands not only of our country but the increasing energy demands around the world, and to hear this optimistic testimony today is something I think all of us can feel very good about.

Dr. Ahn, you even mentioned the words "a minor industrial revolution." Would you just elaborate on that a little bit for me? I love that term, "minor industrial revolution."

Mr. AHN. Thank you, Chairman. I would be happy to. Indeed, the scale and the promise to our economy, which is still struggling to recover from the aftermath of the 2007–2008 recession, is staggering enough that "industrial revolution" might be the appropriate phrase to put it. As I mentioned, we are seeing $200 billion to $300 billion in activity just from the oil and gas revenue alone, but because our economy is still substantially far away from what it has the potential to produce and the number of jobs that it can potentially support, this energy revolution can serve as that trigger, as that stimulus to push our economy back to or even beyond potential output.

Mr. WHITFIELD. And how many new jobs did you estimate maybe by the end of the decade?

Mr. AHN. Yes. The specific estimates are 2 to 3.3 million jobs. About one would be in the energy and the manufacturing sector and then the remainder would come from multiplier effects, as economists would term it, as this new energy boom ripples through the rest of the economy, creates virtuous cycles of consumption and investment.

Mr. WHITFIELD. And did you or Mr. Freeman make any estimates on the amount that we could reduce our trade deficit by the end of the decade?

Mr. AHN. I am sure Raymond James has something but our estimates, my estimate was for the U.S. current account deficit to be reduced by two-thirds.

Mr. WHITFIELD. Mr. Freeman?

Mr. FREEMAN. We looked at a couple a years ago. Half of your trade deficit was importing oil. Obviously if you are no longer having to import oil by 2020, then you are looking at a meaningful reduction in that trade deficit.

Mr. WHITFIELD. Right. And, you know, the President makes the comment frequently that oil production has gone up since he has been President, which is actually true, but it certainly hasn't gone up as a result of any affirmative government program, but I think you would agree with me, Mr. Hamm, that this has been generated because of private capital, people willing to invest their capital, take the risk. There has not been any government program that has assisted in this, has there?

Mr. HAMM. No, actually it has been done actually in spite of, you know, what is going on here in Washington. This thing has taken about 20 years. It was led perhaps by George Mitchell, Linda Barnett, taking—a lot of us were engaged with highly deviated drilling under the cities and actual directional wells even in the

1970s, so it goes a long ways back. But it has been brought on by the private sector entirely.

Mr. WHITFIELD. Well, now, the President has made some comments and others have sort of left the impression that our reserves, our known reserves, are rather small, and I know that the SEC has certain rules on what you can book as reserves. Would you elaborate on that issue a little bit, the known reserves, the reserve issue?

Mr. HAMM. Yes, I would like to. He makes a statement, you know, the United States has only 2 percent of the world's reserves, and actually our production is about 12 percent of daily production in the world, so a huge disconnect here in the way that the United States calculates reserves and the rest of the world. We have what is known as a 5-year rule that it is like the Bakken, we are going to be drilling wells there and developing at least 15 years, probably 25 years from now to fully develop it yet we cannot book anything beyond 5 years, we can drill beyond 5 years. And even though we are in a continuous—the largest continuous oil deposit found in North America and basically the rock is the same through a lot of it, if it's not right against forward drilling, we can't claim it as direct offsets, even though the rock is much the same 20 miles away, 40 miles away, 80 miles away. We can't claim it.

Mr. WHITFIELD. So you have great certainty that it is there but from a financial standpoint you simply cannot claim them?

Mr. HAMM. Yes, it is an absolute geologic certainty, and it has been proven. Just due to the rules, we can't claim it.

Mr. WHITFIELD. Well, last night, I was looking on—or a few days ago—the Department of Energy Web site and the 1705 loan guarantee program, under the DOE Web site, said they created 1,175 new jobs at a cost of $12.8 million of taxpayer dollars per job, and I think about the contrast about what is going on in the oil and natural-gas fields.

Anyway, my time is expired, and Mr. Rush, I recognize you for 5 minutes.

Mr. RUSH. I want to thank you, Mr. Chairman. A very interesting panel so far.

We keep hearing how the Obama administration has somehow implemented policies that are hostile to the oil and gas industries, although I would argue that the facts would indicate that those industries actually have been not hampered but aided and helped in terms of us experiencing the kind of boom that the witnesses have spoken to so far.

And my question is to Mr. Weiss and Mr. Purcell, do either of you agree that, or do both of you agree that the Obama administration is hostile to the oil and gas industries, and what evidence would you point to to support your argument?

Mr. WEISS. Thank you, Mr. Rush. First, let me just—I want to address something that Chairman Whitfield just asked about, which is has there been government support for oil development on private lands, and in fact I believe in Mr. Hamm's written statement, he talks about the value of the tax treatment of investments in drilling where they get a tax break for intangible drilling costs, and I would personally classify that as a form of government support.

Now, to answer your question, I think the only—some in the oil industry may argue that the administration hasn't been hostile the oil industry because they have issued new standards for worker safety and environmental safety on oilrigs in the wake of the BP oil disaster. I think that is an incredibly positive development and in fact the predictions of all the oil growth that Raymond James and Citigroup have made all assume that those new rules are going to be implemented yet we are going to have this explosion in oil production, yet with the production of which offshore is going to be much safer for the workers and for the environment. So I would see that as a plus of what we have done.

The other thing that the administration is focused on is eliminating tax breaks, some of which go back to 1916, that benefit the oil industry that were appropriate at the time that the oil industry was new and starting out but now is unnecessary, and I would argue that the $2.4 billion that goes to the big five oil companies in tax breaks every year could be better spent on things like extending the Production Tax Credit for wind energy, which is a new industry in the way that oil was new 100 years ago.

Mr. RUSH. Mr. Purcell, do you want to try your hand in this, please?

Mr. PURCELL. I can. I can't speak as much to the oil and gas industry and Mr. Obama's position on that as I can his position in carrying out the Production Tax Credit for renewables including——

Mr. RUSH. Let me ask you this question then. Why should Congress invest in renewable energy and wind in particular? What are the benefits in terms of decreasing our reliance on foreign oil as well as in creating jobs and putting Americans back to work?

Mr. PURCELL. Yes, sir. I think, you know, part of my testimony lends to that policy and the continuation of the Production Tax Credit. We have created over 75,000 jobs in a very short amount of time and 37,000 of those are manufacturing jobs of which companies of which I serve. We have had $15 billion of private investment in the wind industry on average over the last 4 years. So there is a tremendous amount of private industry in the wind industry as well. However, with uncertainty with the PTC, both those manufacturing jobs and that investment is at risk today. In fact, most of the developers of wind farms and wind turbines aren't investing money for next year because of the impending expiration of the PTC so as recently as yesterday there was another announcement, another one of the customers that I serve having to close their wind tower factory in Columbus, Nebraska, and Ephrata, Washington, and last week DMI Industries announced closing of three facilities, two of which are in the United States, one in North Dakota and one in Oklahoma, because of the uncertainty of the PTC, so——

Mr. RUSH. How many jobs are affected with the closures?

Mr. PURCELL. With those five factories at peak employment 2 years ago were roughly 1,500 jobs in those factories alone, and those are just two examples recently in the last 2 weeks of plant closures due to the uncertainty of the PTC, and of course, I would say again as part of testimony that I feel like we have bipartisan support from both parties that believe in the Production Tax Cred-

it. You know, we think that now is the time. It is beyond time, and so we appreciate the President's support of the PTC very publicly and it was something quite frankly that President Bush extended back in his term as well, so we feel like both recent Presidents have acknowledged the benefit of the Production Tax Credit and of the wind industry.

Mr. RUSH. Thank you, Mr. Chairman. Yield back.

Mr. WHITFIELD. I recognize the gentleman from Texas, Mr. Barton, for 5 minutes.

Mr. BARTON. Thank you, Mr. Chairman. A couple of observations and then I will ask some questions. You know, some of the opponents of our current market-based energy policy keep harping on the fact of the scarcity issue and the chairman in his questions asked a question about the reserve base to Mr. Hamm. I just want to point out that Texas, which except for a few years in the 1970s and 1980s has been the number oil-producing State in the country, Alaska when Prudhoe Bay was in full production was number one for I think 10 or 15 years, but Texas has averaged somewhere between a million and 2 million barrels of oil production a day for over 100 years. Texas by itself has produced somewhere between 40 and 50 billion barrels of oil in the last 100 years, and one of the most prolific fields in Texas is the Permian Basin, which has been in production since the 1920s, and because of the new technologies, horizontal drilling and hydraulic fracturing and also some water flood projects, Permian Basin this year will produce as much oil as it has produced in any given year.

You know, if you look at what is called proven reserves, which is recoverable today at today's prices and today's technology, the United States proven reserves are 20 to 30 billion. But if you look at recoverable reserves, which it is technologically possible, that we know the oil is there, it is in the trillions. It is in the trillions. And in Mr. Hamm's home State—I assume you are from North Dakota. Is that correct?

Mr. HAMM. Well, I am sure there a lot, but I am actually from Oklahoma.

Mr. BARTON. Oklahoma. But your oil company is in North Dakota?

Mr. HAMM. Yes.

Mr. BARTON. North Dakota 10 years ago was producing 3,000 or 4,000 barrels a day. I mean, it was in the thousands. In the near future, North Dakota is going to produce over a million barrels of oil a day. You know, so it is not necessarily about proven, it is about recoverable, and when you look at the statistics of what is out there, the chairman's home State, Chairman Upton of Michigan, is going to be a huge producer of natural gas, and Michigan is not noted to be an energy production State but in the next 10 years Michigan is going to be producing probably a billion cubic feet of natural gas a day. It is just stunning. So I just wanted to put that on the record.

I want to ask Mr. Purcell, who I have great sympathy for, you are here talking about the wind credit, I believe, and in the 2005 Energy Policy Act, I supported the inclusion from the Ways and Means Committee of the wind credit that you talked about. However, today I don't, and the reason is, because 7 years ago wind was

an emerging technology and we didn't have a lot of wind production. Well, today we do, and the cost per kilowatt-hour of wind is very competitive now, less than 10 cents a kilowatt-hour. In Texas, where we have an intrastate deregulated market, we have wind projects which are selling power into the grid at negative prices because they get the 2.3-cent wind tax credit. I believe that wind power is now a conventional source and a mature industry, although it is still growing, which is a good thing, and it is not acceptable to spend a billion to a billion and a half dollars a year on tax credits. What is your response to that?

Mr. PURCELL. I appreciate your comments, and I can't speak to the negative pricing. I am a steel guy, so you would have to ask somebody a lot smarter than me about that as far as the electricity going back in from western Texas. However, I do know that your State did provide a leadership role in wind under Governor Bush, started the wind initiative in the State of Texas, and today you have the most installed megawatts of any State in the country, over 10,000 megawatts of installed power, getting 8 percent of your electricity generation in Texas from wind power, so it has been a wonderful thing. We appreciate your support in 2005 and sorry you don't feel the same way today.

However, as a steel provider to this industry, and speaking, I think, from industry as a whole, we don't feel like we have completely finished the job and we need the Production Tax Credit extended for a certain period of time to help us finish the job. We have brought down the cost of wind power to where it is competitive over a 20-year power purchase agreement. It is the only power that I know of that can offer a utility a sure price of fuel for 20 years because of course the wind is free. So in my estimation as a steel guy, I am watching my customers laying off folks all across the country and I won't be providing steel plates to any of those factories again so I can't answer your question about negative pricing. I will leave that to someone else.

But with regard to the need for the Production Tax Credit, to continue the manufacturing renaissance, much like was talked about by colleague down the table, we feel like we also have had a major manufacturing renaissance in the wind power industry and those jobs are at risk and being lost today, Mr. Barton. Thank you.

Mr. BARTON. My time is expired.

Mr. WHITFIELD. The gentleman's time is expired. At this time I recognize the gentleman from Texas, Mr. Green, for 5 minutes.

Mr. GREEN. Thank you, Mr. Chairman.

Mr. Ahn and Mr. Freeman, both of you note how increased domestic production would bring down the price of oil in the next 10 years yet petroleum and gasoline prices are set by a complex mix of factors including global crude prices, increased world demand, refining capacity, maintenance schedules, gasoline imports, proscriptive fuel mandates and geopolitical events. Unfortunately, these factors are beyond our effective control. Canada is a net exporter and an actual oil-independent nation but gasoline prices in Canada rise and fall in accordance with world events. Can you please walk me through the basis on why you made your projection that it would actually be able to lower prices if we just increased more in the United States? Now, I agree if you put more oil on the

world market, you know, the price will be more flexible just like every once in a while when the President decides to release it from the SPRO, we will see some flexibility over a few weeks but it goes back.

Can you tell me why you think that our gasoline prices will go down if we produce more domestically, either one of you or both of you?

Mr. AHN. Thank you, Congressman, for that question. I will be happy to elaborate. As I mentioned in my remarks, we are estimating that global oil prices could fall by 15 to 20 percent thanks to the combination of both new supply and declining consumption domestically. Just to break that down a little, we see about 14 percent of that comes from new supply and about another 3 percent of that comes from declining consumption, but this is ceteris paribus, all else equal, when you so correctly mention that global oil prices are set by a multitude of factors, much of this outside of our borders.

That said, both the secular decline in consumption domestically is part of a broader movement of declining consumption around the world in response to historically high prices during the latter part of the past decade, even in countries such as China, as part of the 12th economic 5-year plan have made improving their domestic energy efficiency a key goal. So we will be seeing both a broad trend of declining consumption around the entire world at the same time as we see not just a burgeoning supply coming from the United States and North America but also from the Middle East, from Africa, from Australia, from Brazil, even the resurgence of supply from traditional sources such as Iraq, Russia, et cetera. So the United States is at the heart and at the forefront of this revolution but it is a global revolution in which we would see substantially lower prices.

Mr. GREEN. Mr. Freeman, I only have less than 2 minutes. Do you basically agree with that that it is both increased production not just in the United States but potential in other countries but also substantial reduction in demand?

Mr. FREEMAN. Yes, it is definitely a combination of both. You know, obviously it was easier to drive down the natural-gas price because natural gas was not a fungible global commodity in North America and there is a reason you have got, you know, nearly decade low natural-gas prices. It does take longer for oil because it is a global fungible commodity. You probably have noticed, you know, your West Texas intermediate price is a good $17 less than what the global oil price is right now. So we are seeing an impact from the rapid supply growth we have got in this country. We are expecting the oil price here to drop a good $30. Now, there will be times when OPEC may respond and cut production, and that will temporarily pop up the price again.

Mr. GREEN. Let me cut off because I only have 45 seconds left and I have a number of other questions. But, you know, not only production, which I support expanded domestic production, offshore and onshore, and also what Canada possibly brings on, but one of the issues I have—and I had a great trip, by the way, to Alberta a couple weeks ago to see the oil sands and the success that they are having. We would like to get that to our five refineries but a

million barrels a day sounds great, but the district I represent, we use over a million barrels a day in our five refineries so I don't think there is a panacea here because we expand ours. Maybe if we got that cheap West Texas oil to Philadelphia, they wouldn't be closing their refineries.

Mr. Chairman, I know I am out of time but obviously I have a lot of other questions.

Mr. WHITFIELD. Thank you. At this time I recognize the gentleman from Kansas, Mr. Pompeo, for 5 minutes.

Mr. POMPEO. Great. Thank you, Mr. Chairman.

Mr. Hamm, it wasn't very long ago that there was peak oil, we are about out of the stuff. All of American energy policy really for the last 25, 30 years under both parties was premised on that notion. Any validity to the fact that you are wrong, that what we have heard from these economists today is wrong and that we do have this challenge in front of us in the near term?

Mr. HAMM. There are several believers in peak oil. I wasn't in that group. You know, there are still some people, I guess, that maybe are talking about peak oil. But, you know, frankly it is supply and development and we are seeing so many other oil plays across the United States today that, you know, it is almost too many to quantify at this time. But the big ones that we have, of course the Bakken and Eagle Ford, and that is adding so much supply here in the United States, plus natural-gas production across the United States brings a lot of liquid with it as well.

Mr. POMPEO. You bet. Don't forget the Mississippi shale in Kansas 4th Congressional District.

Mr. HAMM. That is correct. Mississippi is a big play.

Mr. POMPEO. Absolutely.

Mr. Purcell, I heard you talk about the wind Production Tax Credit created 37,000 jobs and you talked about an expectation of its continuation. I find that very surprising. We have known for a long time when this thing was going to expire. It is a date certain that is in current law. Do you regret having built your business model on the assumption that politicians would extend that Production Tax Credit? Because now you are talking about laying folks off, and you turn it back to us and say gosh, you all need to extend that so my people don't get laid off. Well, you made the decision to hire those folks based on law you knew was expiring so I am interested in whether you have any regrets about having built your business model around that.

Mr. PURCELL. No, quite the contrary. It has served us very well. We have been able to grow our company in other ways. Quite frankly, you know, I sit here before you with regard to the Production Tax Credit but our company services other industries that are being talked about as well today, and we are actually greenfielding a plant south of Fort Worth, Texas. We are going to spend $10 million down there developing in that area for both wind, oil and gas. So, you know, specific to the Production Tax Credit, yes, there is an expectation that that would be continued to allow the wind industry to continue the work that we are doing but the turbines are getting more efficient. The towers are getting taller, which is good for me, more steel under the turbine. The blades, the technology is getting better. A lot of things with regard to siting and wildlife are

getting better. So everything that we are doing in the wind industry I feel is beneficial. However, much like going back to 1916, we talked about subsidies for oil, it took a long time for the country's oil to get as well, so it is something that we feel like we just need a few more years on.

Mr. POMPEO. I appreciate that. I went back and looked at the record from the 1980s and 1990s. The industry has said just a couple more years for an awfully long time.

Mr. Mills, you talked about policies we could do to exploit this enormous renaissance. What is the most important thing we could do as a Federal policy matter? We have now got 10 agencies investigating fracking. The last time 10 agencies investigated something and did nothing, none of us were here. So we know the Federal Government is on the march. What is the most important thing we could do as a policy matter so that we do continue this incredible economic opportunity for our country?

Mr. MILLS. That sounds like the hardest question to me in terms of the most important thing that Congress can do.

If I might just briefly add on your question about peak oil because it is a very interesting one, the abundance of oil production and natural gas in the United States is not a consequence of us suddenly discovering that there is oil or gas here, as you well know. We didn't find a new planet or a country; we got new technology. And what is interesting with the technology aspect of this is, technology unleashes the resources, not finding the resources per se, and it is an indicator of what the future holds, the idea whether this is a peak or not. We can look at patents as sort of a forward-looking indicator of what is emerging. So we did some research and looked at the last 5 years the numbers of patents issued in non-hydrocarbons, about 60,000. The number of patents issued in the same 5 years in the hydrocarbon fields is 150,000. So this is a permanent shift in the technological revolution.

I have a lot of people in industry ask this question you asked me, and the answer is almost always the same, and I know this committee has heard this in other hearings from other witnesses, everyone says almost universally those who make things can build things. We don't mind accommodating regulations but you have to back off, Washington, you have got to help us out here. It is not that we don't want to do things safely and in environmentally sensible way, every businessman I talk to in every industry is on board with this. This is the 21st century. But they are literally crushed by the quantity, the diversity, the complexity and slowness of regulations. So the regulatory process has evolved and grown in a chaotic way. They are asking for help and for relief, not to have no regulations but to make sense out of them. My sense is that with 21st century information technology, we ought to be able to fix this thing.

Mr. POMPEO. Thank you.

Mr. Chairman, I yield back.

Mr. WHITFIELD. Thank you. At this time I recognize the gentlelady from Florida, Ms. Castor, for 5 minutes.

Ms. CASTOR. Well, thank you, Mr. Chairman. I want to thank you for calling this hearing to highlight the great successes in the energy sector during the Obama administration. Really, the testi-

mony here from the experts is quite remarkable, and I am glad to hear from Raymond James. They are headquartered in my area in Tampa Bay, and people all across the country trust your advice, and you were kind enough to do kind of a bullet-point presentation. It is very helpful. The United States can become energy independent by 2020 under current policy. Before the end of this decade, the United States will become the largest oil producer in the world. That is astounding. America has added more barrels to global oil supply from 2008 to 2011 than any other country despite the deepwater drilling pause necessitated by the most devastating offshore blowout in history, the Deepwater Horizon.

On the demand side, good news. Petroleum imports have declined by 3.8 million barrels per day. Since 2005, oil demand has fallen every year. Oil demand is forecasted to decline and the main factors that are driving this decline in demand are the policies that the Congress in past years and the Obama administration has put in place. They include fuel economy, the CAFE standards and changing consumer preferences and a decline in miles traveled.

Citigroup identifies a minor industrial revolution that is happening in the American heartland. Even the chairman was a little bit excited about that. Mr. Mills stated there are millions of jobs on the way. That is good news. Mr. Hamm also heralded that America is now number one in natural-gas production. This is all very positive, and it is interesting—and Mr. Weiss, I would be interested, I see you smiling on this. These market conditions really do belie the Republican messaging that has been going on when it comes to energy, that the American energy sector is stagnant. How do you commend on that?

Mr. WEISS. Well, I think the reports from Raymond James and Citi GPS are very encouraging because they say we can continue to grow our oil industry without expanding into currently protected places that are owned by all Americans, and I think that is very important.

Ms. CASTOR. I consider the Florida Everglades as one.

Mr. WEISS. Yes.

Ms. CASTOR. Boy, that has gotten people's attention.

Mr. WEISS. And in fact, one of the things that is so disturbing is there is a recent proposal. Mr. Hamm heads up Mr. Romney's policy shop for energy. The Romney energy plan would allow States to decide whether or not to drill in federally owned lands, and one of the places there are already oil holdings, oil leases held in National Park units includes the Everglades along with the Flight 93 Memorial. So conceivably, the State of Florida could allow oil drilling in the Everglades under the plan that Mr. Romney has put together, and that would put a very important ecological and economic resource at risk because, as we know, even drilling done as safely as possible as, you know, lots of environmental impacts including roads, spills, benzene pollution, all kinds of stuff.

Ms. CASTRO. Yes, it is off base and it is not needed, and that is what a lot of the reports through the testimony here today demonstrate.

But one other important element of maintaining a diverse approach to America's energy policy, it is devoid from a lot of the Congressional hearings that we have had this year, it is devoid

from the Romney plan, and that is focusing on technology and creating jobs through clean energy, helping Americans save money and American businesses save money, put money back in their pocket.

And I wanted to highlight a press report today that is also very positive. There is a revolution happening in solar power. Big-box retailers, large chain stores are installing rooftop solar power to help meet their energy needs but to save them money. Walmart, Costco and Kohl's, commercial installations with solar power have increased sharply in recent months. More than 3,600 nonresidential systems were activated in the first half of 2012, bringing the number of individual solar electric systems to 24,000. Almost half of the top 20 commercial solar customers are major retailers like Bed, Bath and Beyond, and Staples. Ikea, one of the chains in the top 20, plans to have solar arrays on almost all of its furniture stores and distribution centers by the end of the year, so that begs the question, Mr. Hamm, why in the Romney energy program and policy is it completely devoid of creating jobs through technology and clean energy? It is so one-sided to oil and gas.

Mr. HAMM. Well, there is a lot of technology in the oil and energy sectors, we know that, and it ought to be market-based, and that is what it comes down to, is what the market can afford and will afford and will sustain. We are talking about sustainable jobs going forward, and energy that is produced that is twice as high as anything else may not be there, you know, so it has to come back to what the market can afford.

You made a comment, I think, on Federal land restrictions, you know, we are not talking—nobody is talking here about Federal parks and monuments. We are talking about the 40 acres out there and the 1280 that it takes 10 months to get a permit to drill under, not on, out there in North Dakota. So there is a lot of restrictions out here that something has got to be done about it.

Ms. CASTOR. Thank you.

Mr. WHITFIELD. The gentlelady's time has expired. At this time I recognize the gentleman from Louisiana, Mr. Scalise, for 5 minutes.

Mr. SCALISE. Thank you, Mr. Chairman. I appreciate you having this hearing, and I think a lot of us have been pushing to get North America energy independence within a decade. It is clearly a goal that we can achieve, but it is also clearly a goal that can't be achieved under the current policies of President Obama, and you know, while some people want to reinvent history and reinvent current policy in trying to change the record, you know, I always find it intriguing when you hear President Obama bragging that production has never been higher when first of all, if you look where production is up, because in some areas production is up and in some areas production is down, ironically, production is down in the areas where the President has control, on Federal lands, and production is up in the areas where he currently does not have control, on private lands, but where he and his administration are trying to go shut it down. So he is bragging about something he doesn't create. I know he has got a good history of trying to blame other people for things that happened under his watch but in this case he is actually trying to take credit for things that he is actu-

ally trying to shut down. Production is lower on Federal lands, and that is not disputed by his own Energy Information Administration.

I do want to correct the record before I get into a few other things. Early on Mr. Rush was, I guess, questioning Mr. Weiss as to why he thinks that some of us feel that the Obama administration has been hostile towards American energy, and I think Mr. Weiss's comments were to try to blame it on the Macondo well as if some of us don't want to address that problem. Clearly, you know, we pushed hard to see that—and we have seen a dramatic advance in the technology just in the last 2 years for responding to a disaster like we had, but at the same time what a lot of us were concerned about, that still makes us hostile today is, number one, the President went in and shut down production, shut down exploration and drilling for 6 months when his own advisors—the President put together a taskforce of experts of scientists and engineers to look at safety, and his own safety experts said it would be a bad idea and actually reduce safety in the Gulf to have a moratorium, and the President went and doctored the report and put the moratorium in place anyway, tried to blame it on his scientists and engineers and they said wait a minute, we think it is a bad idea because you are going to lose your best workers, you are going to lose your best rigs, and that reduces safety, and in fact, that is what has happened. I mean, we have been tracking since Macondo. We have been tracking the rigs that have left the Gulf of Mexico not to go to other parts of the United States, to go to other countries, and you look at where these assets have gone, each one of these represents about a billion-dollar investment and about a thousand American jobs that we have lost because of the President's hostility towards American energy. They go to places like Nigeria, Sierra Leone, Egypt. I mean, think about what is going on in Egypt just this week and yet there are companies that say they would rather take a billion-dollar investment and a thousand jobs and they feel it is better to do business in Egypt with their crazy climate than in the United States of America because of the President's hostility towards American energy production. That is what is going on. That is the record of this administration and yet he wants to brag that production has never been higher when he is trying to shut it down. He has been successful in shutting it down to some degree in the Gulf.

Mr. Freeman, I want to ask you about that because, you know, if look at where production is up and where it is down, where is it in the Gulf of Mexico right now?

Mr. FREEMAN. Yes, you know, you have got over 80 percent of your production growth recently, and through 2015, coming from three areas. It is the Bakken shale in North Dakota, the Eagle Ford shale in South Texas and the Permian in West Texas. The offshore, obviously prior to Macondo, the offshore Gulf of Mexico was under sort of a renaissance. We had actually started to grow supply there, started to go to more deeper waters and supply was up about 250,000 barrels a day in 2009. Last year, supply was down in the Gulf of Mexico nearly 250,000 barrels a day. So we are growing despite the fact that we have got the Gulf of Mexico as sort of a drag.

Mr. SCALISE. Production is down on Federal lands there in the Gulf of Mexico. Of course, we want to see increased safety. Companies that had a great safety record today can't even get a permit. And so those jobs are leaving our country. That makes us less secure. That kills jobs in America. It kills money that is coming in the Federal Treasury. One of the reasons President Obama runs up trillion-dollar-plus deficits every year he has been in office, you know, that is billions of dollars not coming in the Federal Treasury when he sends those jobs to Egypt. He is sending jobs and assets to Egypt because of his policies.

Let us not forget that the President himself said he wanted to see electricity prices skyrocket. His Energy Secretary said he wanted to see gas prices go to the levels they are in Europe. And let us also not forget that one of President Obama's top EPA officials said they want to crucify energy companies. So you wonder why there is a hostility towards President Obama's anti-American energy policies? It is because of President Obama's record. We just want him to live up to the words that he says. And yet his policies are destroying energy.

And I want to leave on this, Mr. Hamm, because I know you have been very active in the energy industry where it is growing. If you can share with us some of the things that you have seen and when you are making decisions on where to go and explore for energy. Do you look on Federal lands or do you look on private lands and do these policies have a factor in that?

Mr. HAMM. Actually, it has been Continental's policy as much as possible to avoid Federal lands just due to the delay. You know, we are a growth company and——

Mr. SCALISE. Due to the policies of the administration?

Mr. HAMM. Well, due to the policies and restrictions on Federal lands. I mean, we have seen permits take as much as 2 to 3 years, and you know, it is just impossible that you can do business in that regard, so we steer clear of them, and you see the companies that, you know, are not growing very fast, they are involved in Federal lands.

Mr. SCALISE. Thank you. I yield back the balance of my time, Mr. Chairman.

Mr. WHITFIELD. The gentleman's time is expired. At this time I recognize the gentleman from Maryland, Mr. Sarbanes, for 5 minutes.

Mr. SARBANES. Thank you, Mr. Chairman. I appreciate it. Thank you all for your testimony.

There is a lot of rhetoric on this topic. I sat through many, many meets of the Natural Resources Committee, which I served on previously. We had great debate over whether this administration, the Obama administration, is hostile to energy production on land, offshore and on Federal lands, etc., and the argument that that is the case is not supported by the facts. In the last 3 years, production on Federal lands is actually increased compared to the last 3 years of the Bush administration. Despite all the efforts of certain members of the Natural Resources Committee to argue that a de facto moratorium had been placed on offshore oil production by the conduct of the newly organized agency that oversees that, in fact, the timing for obtaining permits has been expedited even with building

in the new safety standards, which are absolutely appropriate after the tragedy that occurred. So I think a fact check would show that there has been very strong support from this administration with respect to offshore oil and gas development as well as with respect to on Federal lands, and we had a lot of good testimony that showed that the industry holds leases and permits with respect to Federal lands that they are not taking advantage of and there never seems to be an adequate explanation for that.

I had a couple of questions, observations. You know, there are two lenses you can bring to this revolution with respect to the abundance of resources, energy resources that it is going to offer the country going forward, and you can look at it through a lens of energy independence and, you know, the inexpensive availability of energy, and if you look at exclusively through that lens, it looks wonderful. I mean, I grant you that, and obviously we want to move towards energy independence. Projections of that being able to occur by 2020, which is what I am hearing, are quite exciting.

But if you add to the lens of this opportunity the issue of impact on the environment and pollution and so forth, it doesn't look as great, one has to concede, so the question is, how do we kind of blend those perspectives and come up with an approach that makes sense because when you talk about oil, you talk about—I mean, I think the three energy sources that were noted were oil, natural gas and coal in terms of significant energy production in this country. Well, they all have issues with respect to the environment, as we know, and natural gas is a cleaner opportunity and that has been discussed at length, but as compared with renewable-energy sources like wind and solar and so forth, which are much better for the environment, those things if you look at it through that particular lens don't maybe look as great.

So that has to be part of this discussion, and one of the questions I have is, it must be the case that with this new abundance, this new revolution that we are talking about, it gives us more opportunity to both explore the environmental concerns and make sure we are doing that right as well as continue to pursue a highly diversified energy post office which includes a significant amount of investment in renewable-energy sources as versus a situation where you are so dependent on overseas and it is a much more competitive situation. So can somebody speak to that? Maybe I will start with you, Mr. Weiss, and I think I am going to run out of time here, but if you could respond to that?

Mr. WEISS. Well, you know, there are lots of opportunities. As you noted correctly, according to CRS, oil production on Federal lands is up slightly in 2011 compared to 2007. So claims that under President Obama oil production on Federal lands is down is false.

In addition, as you also noted, there are consequences to this great abundance that we have. For example, the New York Times reported last year that in North Dakota "every day more than 100 million cubic feet of natural gas is flared this way. This flared gas spews at least 2 million tons of carbon dioxide into the atmosphere, which is about as much as almost 400,000 cars." So there are costs to this as well, and that is why we have to have a system where we make sure that we expand the development of these resources in a way that benefits our economy and our security but also

doesn't threaten our economy and our security with climate impacts and other health impacts that can be even more expensive.

For example, the drought that we are facing today across America is going to cost at least $5 billion in crop damage, and that is the kind of event that is going to occur with more frequently if we don't address the climate piece of energy production and use.

Mr. SARBANES. Thank you.

Mr. WHITFIELD. The gentleman's time is expired. At this time I recognize the gentleman from West Virginia, Mr. McKinley, for 5 minutes.

Mr. MCKINLEY. Thank you, Mr. Chairman.

Let us stay on that, Mr. Weiss, just for a minute. When they go back and they study the—the scientists go back and study the Dust Bowl of the 1930s, I find it curious in my reading that they blamed the temperature of the oceans, the instability of the oceans, the change in the temperature between the Pacific and the Atlantic. I never hear them talk about carbon discharge, and these are all retroactive studies. These are taking today's standards and reapplying them back into that period. Can you explain in very short why?

Mr. WEISS. I have not looked at the Dust Bowl aspect but I will tell you this——

Mr. MCKINLEY. The Dust Bowl is probably the——

Mr. WEISS. I understand, it is the worst drought in America. I understand that.

Mr. MCKINLEY. But none of the climatologists and the scientists blame climate change. They are talking about what has happened with the Pacific and the Atlantic Ocean and the jet stream. I am troubled. I am troubled. Let me just characterize. I get a kick out of you. You have been here several times before our committee. Remember that show, "Bat Masterson"? Do you remember that, "Have Gun, Will Travel"?

Mr. WEISS. A little bit before my time, Mr. McKinley.

Mr. MCKINLEY. Well, perhaps it may be, but he was brought in when they needed someone with a gun, and you show up all the time to attack the carbon fuel industry and you do a pretty good job of it, but it is based on, I think, a lot of ideology and not on the facts. You go back to be able to prove some of this information that in the past, they just don't—you are pushing an issue that just doesn't hold up.

I am just curious, do you support the idea of us shipping, exporting coal and gas out of America?

Mr. WEISS. I believe that resources—and this is me speaking personally, not for the Center for American Progress Action Fund—I believe that resources that are developed from public lands which are owned by every American in this room and all across the country ought to be used for Americans so that we are expanding——

Mr. MCKINLEY. Just generally across the board, should we be able to export? I don't know, once gas gets in a pipeline, I don't know whether it has come from public lands or private lands. So when we are trying to ship natural gas out of this country, you know, LNG to sell it, you are opposed to that?

Mr. WEISS. I believe that——

Mr. MCKINLEY. Just yes or no, please.

Mr. WEISS. Well, it is not a yes or no question. I believe that——

Mr. MCKINLEY. Yes, it is. Then if you are not——

Mr. WEISS. Resources produced from our lands should be kept here.

Mr. MCKINLEY. Do you think America can afford to be having higher utility bills?

Mr. WEISS. No, we need to make sure that——

Mr. MCKINLEY. You don't think we can afford it?

Mr. WEISS. Remember, there are other prices included in the cost of burning coal than just the price of the coal and the land and the facility itself. For example, the health care costs from air pollution—mercury, soot, toxic chemicals, cancer-causing agents—is in the billions of dollars a year and——

Mr. MCKINLEY. The EPA——

Mr. WEISS [continuing]. The EPA rule says——

Mr. MCKINLEY. You are just a hired gun here. You are already saying that the worst air is air that is indoors, not our outdoor air. Even the EPA says it is 96 times worse indoors than our outdoor area.

Mr. WEISS. But we ought to address indoor air pollution as well, but that doesn't mean we ought to spew thousands of pounds of mercury, which is a known neurotoxin——

Mr. MCKINLEY. And as you well know that there is more mercury in a can of tuna fish than there is a can of fly ash. So——

Mr. WEISS. And where did the mercury get into the tuna fish? It came from air pollution.

Mr. MCKINLEY. We eat the tuna fish. We don't eat the fly ash.

Let us go on to this thing that—so what percent are you trying to get to in terms of fossil fuels? Where do you want to take us when you come in with these kind of testimonies? Do you want us down to eliminate coal or are you trying to get us down to 20 percent? What is your vision that you think would be right for America?

Mr. WEISS. I think what is right for America is to use our resources in a way——

Mr. MCKINLEY. Percentage-wise.

Mr. WEISS. I won't give you a figure but I think we ought to use our resources in a way that allows us to also not have kids have asthma attacks, not have pregnant women——

Mr. MCKINLEY. You don't know whether the asthma attack is caused by the outdoor air or the indoor air quality.

Mr. WEISS. No, we do know that. We don't know whether asthma is caused by that but there are studies by Harvard University and other medical schools that show that asthma attacks increase with the frequency of air pollution. We are not saying it causes asthma but it causes asthma attacks.

Mr. MCKINLEY. You don't know whether that asthma attack has been caused by dust mites, aerosols or formaldehyde sprays in your house, so——

Mr. WEISS. I will be happy to provide some studies to you for the record.

Mr. MCKINLEY. Do you have some other information that indicates that anything other than the fact that the CO2 emissions now in this country are the lowest they have been in 20 years?

Mr. WEISS. I don't believe that is accurate, sir. I believe that they have gone down in recent years but 2005——

Mr. MCKINLEY. The EIA just published that.

Mr. WEISS. Well, I will double-check that.

Mr. MCKINLEY. Read up before you come here to testify again. I yield back.

Mr. WEISS. And who was Bat Masterson's top opponent? Because you are quite a worthy one, sir.

Mr. WHITFIELD. I don't know his name, either. Mr. Sullivan, you are recognized for 5 minutes.

Mr. SULLIVAN. Thank you, Mr. Chairman.

Mr. Weiss, it was interesting when you were discussing in one of your comments earlier. You said that the oil and gas industry gets this handout, subsidy. I think you are referring to intangible drilling. And I was wondering, you have worked for the Center for American Progress, and you have worked there a while, I am sure. Do you ever travel around the country at all to go to conferences or anything like that? Yes or no.

Mr. WEISS. Well, that is a two-part question. Yes, I travel around the country. No, I generally don't attend conferences.

Mr. SULLIVAN. But you travel for your job?

Mr. WEISS. Several times.

Mr. SULLIVAN. And when you do that, you have meals and hotels and lodging. Does your company pay for that? Do you send it back to them, they pay that? Do you get expensing on that?

Mr. WEISS. Yes.

Mr. SULLIVAN. OK. It is a cost of doing business, isn't it? Right?

Mr. WEISS. Yes.

Mr. SULLIVAN. Do you think that is a handout subsidy giveaway to your group?

Mr. WEISS. Well, first of all——

Mr. MCKINLEY. Is it or not? Yes or no.

Mr. WEISS. No, it is not because we are a nonprofit, tax-exempt organization.

Mr. SULLIVAN. OK. I would like to ask Mr. Hamm. Mr. Hamm, intangible drilling is important to the industry. Now, they don't hand you a check and give you just a check. The government is not handing you a check. Now, Mr. Hamm drills wells that sometimes don't come in, unfortunately. He has lost money. Oil prices have been down very low in the past. A lot of people aren't—the President even said this is an industry of yesterday. How are we going to get young people in the business when he says something like that? Because of the ups and downs of the business in the past. So he gets expensing. He doesn't drill it, he doesn't get it. You don't travel, you don't get it for your group. Now I would like Mr. Hamm to comment on how important that is to this industry.

Mr. HAMM. Well, it is very important. It would cut 35 to 40 percent of our activity, you know, if we weren't able to expense the cost for labor, and that is what it comes down to. I drill 17 dry holes in a row, and there is no subsidy in this business, I guess I went up to the wrong window. Nobody handed me a check. So, you know, we take a lot of inherent risk in this business and we certainly have to have some room to try and fail. If it wasn't for that, we would not be having this revolution in energy that we

have today. You know, it took 16 years, you know, in the Barnett to break the code. You know, it took 18 un-commercial wells in the Bakken to break the code. So it is a very expensive process.

Mr. SULLIVAN. A lot of research and development, a lot of money went into that, and it is expensing, and you know, right now we import a lot of oil, it has gone down somewhat, but we are importing oil into this country. We have oil here in the Bakken, for example, a tremendous amount. It is mind-boggling. And, you know, we need to get that out. Why not produce that? And if we took this away, this expensing, not a handout, not a giveaway, not a subsidy, it is not that, 30 percent reduction, and that is asinine to do that. And we would just bring more oil into this country. We can produce oil here in the United States of America, American-made energy right under our feet, God has given a great resource, let us use it. And we have people that don't want to do that, but it is just mind-boggling to me. I don't understand that and I guess I never will.

Mr. WEISS. Mr. Sullivan, may I respond?

Mr. SULLIVAN. Yes.

Mr. WEISS. Very briefly. The point I was trying to make is, the Production Tax Credit for wind energy is similar to the intangible drilling cost rule that Mr. Hamm uses for his business. It helps provide certainty. It helps provide support. It helps keep their business growing, especially this is an industry that is in teenage years as opposed to——

Mr. SULLIVAN. Well, this industry, with all due respect, wouldn't survive without the PTC.

Mr. WEISS. Mr. Hamm said his industry——

Mr. SULLIVAN. Mr. Hamm's industry would go down 30 percent, and right now we need to have as much oil produced here in the United States as possible. I think it is ridiculous to send a billion dollars every single day overseas to buy foreign oil and have that money bounce around other economies and subsidize other nations and their economies, and we have people hurting here and it can bounce around our economy, have a dynamic economic effect here. It makes perfect sense.

And Mr. Freeman, my next question is to you. In your testimony, you cite aging workforce as one of the challenges facing the oil and gas industry. Do you think young people are encouraged to enter this sector when their President, President Obama, refers to it as yesterday's industry?

Mr. FREEMAN. It is obviously the perception of the oil and gas industry—is one that for quite a while that has been difficult to attract a younger population to. I think you generally had to see, like I mentioned earlier, the average age of a petroleum engineer is this country is 50 years old. So you are constantly having to ask them to work longer and longer because we are having a very difficult time attracting younger people to this industry despite all of its upside and how dynamic the industry is. It is unfortunate the perception that is out there is not a positive one.

Mr. SULLIVAN. Wouldn't it better for our leaders to promote this industry as a good place to work in that we can produce more American-made energy as a national security issue to lessen our dependence on foreign oil, get more young people involved in this

energy renaissance and have American-made energy? Isn't that a better idea?

Mr. FREEMAN. Absolutely. There is a reason the highest-paid undergraduate job coming out of college is petroleum engineer. You can make six figures.

Mr. SULLIVAN. So it is not yesterday's industry. In your testimony also, you explained that between 2008 and 2011, the United States added more barrels to global supply than any other country despite the Obama administration's moratorium because of onshore production. Five years ago, wasn't the Gulf of Mexico supposed to be the major growth area for domestic oil production?

Mr. FREEMAN. Do you want me to respond?

Mr. SULLIVAN. Yes, sir.

Mr. FREEMAN. That is correct. It wasn't that long ago that the Gulf of Mexico was one of the few sources of growth. Obviously, as has been talked about in this hearing, the renaissance that first took place in natural gas has transformed itself to oil. Just to name one play that may be interesting and then I will wrap up. I know that we are out of time. You know, the Eagle Ford shale in South Texas wasn't producing a barrel of oil just 3 years ago and now you are producing over 500,000 barrels a day. It is that sort of development that has put this country in the position it is in.

Mr. WHITFIELD. The gentleman's time is expired. Ms. Capps from California is recognized for 5 minutes.

Mrs. CAPPS. Thank you very much, Mr. Chairman.

Mr. Weiss, I understand you weren't able to complete your answer to Mr. McKinley, and I would like to give you a couple seconds to respond, but I do have questions for you and also Mr. Purcell so I——

Mr. WEISS. I will take the questions. I was finished with Mr. McKinley. Thank you.

Mrs. CAPPS. Anyway, then I will proceed. You have suggested investing more Federal funding for clean energy as a benchmark to target for the United States staying competitive. You have argued this would support the government's partnerships in innovation with the private sector and would also help give the private sector greater access that it needs to develop, deploy and commercialize clean-energy technologies. I think you would agree, we already have many cleaner energies all ready to go. We just have to get them into the marketplace. Do you have any suggestions for us on ways to get these technologies deployed and how they would make us more energy self-sufficient in this Nation? Would freeing up Federal funds be helpful? I think you have suggested removing fossil-fuel production subsidies to be a possible solution.

Mr. WEISS. I have two quick examples. First, as Mr. Purcell talked about, extending the Production Tax Credit for wind energy will help that industry continue to grow. We have doubled wind energy production in the last 4 years, and right now wind is equivalent of over 20 nuclear-power plants, I think that is right, or is it 11? Something like that, a lot of energy. So let us continue that. And it is expanding in States like Texas, and Oklahoma is a growing wind energy State as well.

Second, Representative Biggert and Representative Markey have a bill that would invest a small amount of money in a race to the

top to build recharging stations for plug-in hybrid vehicles or electric vehicles. Let us do that so that way people will have recharging stations. In fact, Congress has just agreed to put in recharging stations on both the House and Senate side for their members and staff who drive plug-ins or electric vehicles. I think we ought to do that in communities as well. And the Biggert-Markey bill would cost, like, $400 million. It is a very small amount in a race to the top to help build the infrastructure to give people certainty to drive these vehicles that use little or no gasoline.

Mrs. CAPPS. But actually, to follow on, Mr. Weiss, we have seen recent legislative proposals which would undermine these very standards. For example, a bill to overturn lighting efficiency standards policy that would result in our foregoing the need for 30 additional large power plants and consumers which would collectively save more than $10 billion consumers would on their electricity bills each year. And next week we might have legislation on the floor to delay or block EPA standards that when fully implemented will save lives and improve public health and encourage clean-energy job creation and economic growth.

So Mr. Weiss, what is the real impact of delaying or blocking standards that will encourage innovation and more investments in clean energy? Would you say that stopping these standards would hurt America's chances of achieving energy independence?

Mr. WEISS. Delaying the standards won't affect our ability to produce more oil, domestic oil or natural gas. What it will do is, delaying standards on pollution from power plants, boilers, and cement kilns would increase the number of premature deaths to something like 24,000 people annually, thousands of hospitalizations and tens of thousands of asthma attacks, and it would cause, I believe, close to $200 billion a year in additional health care costs and lost productivity. Delaying those standards: a huge human cost, huge economic cost, no impact on producing more oil and gas.

Mrs. CAPPS. OK. And finally, Mr. Purcell, I am one of many bipartisan supporters in this Congress of the wind energy PTC, the Production Tax Credit. Many of us have companies in our Congressional districts that have benefited from the PTC. Clipper Wind, for example, which laid off 170 employees last month in Iowa, is headquartered in my Congressional district. They tell me that the uncertainty about the PTC being extended is the reason that we have seen now a slowdown in this industry just when it is, as you said, Mr. Weiss, just taking off like the wind, as you could say. I think that point has been pretty well made already, but I want to ask you about the importance of extending the PTC not only to provide certainty to your industry but as a long-term extension, I would argue, wouldn't this lead to even more innovation within the industry if you have that certainty of getting those tax credits?

Mr. PURCELL. Yes, in my opinion, it would. I do know that because of the uncertainty, there have been huge commitments for research and development centers by the major wind turbine manufacturers canceled in the United States in places like Massachusetts and Texas and Colorado where these research and development facilities were planned to continue the development for wind energy productivity and efficiency that will allow it to stand on its own. And I might add, if I will, to Mr. Pompeo's comment about

consistently asking for Production Tax Credit renewal, the last time that we had a major extension, we felt like it was a bridge to a Federal renewable electricity standard, which we were very close to, if you remember in 2008 right before the financial crisis, which steered the country in a different direction. So we felt like the Production Tax Credit was a way to a Federal long-term stable policy to help us finish the job and become competitive and provide a long-term solution for clean energy. So the Production Tax Credit is what we need today. It is the most viable thing to continue the work we are doing. However, there are some other vehicles we think would also be helpful for future including a renewable electricity standard.

Mrs. CAPPS. Thank you very much.

Mr. WHITFIELD. At this time I recognize the gentleman from Virginia, Mr. Griffith, for 5 minutes.

Mr. GRIFFITH. Thank you, Mr. Chairman.

Mr. Mills, could you go over those patent numbers again? I wasn't able to write them down fast enough for the new patents in the hydrocarbon field and the new patents in the alternative-energy field.

Mr. MILLS. Yes, sir, I would be happy to. In fact, as I mentioned, the reason we looked at patents was as a forward-looking indicator of where innovation has been happening and where it is going to go. The aggregate total patents issued, and not filed, so the issuances are the measure that matters, in all the alternative-energy domains, so this was a very broad sweep, 60,000 patents issued, roughly. In hydrocarbon technologies, all flavors, coal, oil and gas, that industry has issued 150,000 patents over the same 5 years, the innovators and engineers in that business.

Mr. GRIFFITH. All right. Thank you very much. And if I can paraphrase what I think I heard your testimony, reading between the lines, was that we are at a turning point in our country. If we choose to use the God-given resources, the natural things that are here, the energy sources that we have, we can remain the number one nation economically in the world for many, many years to come. It is a choice we have to make. If we choose not to use them, you see us perhaps not being the number one nation, say, 20, 30, 40 years from now. Is that correct?

Mr. MILLS. That is a fair assessment. Other countries will supply the fuels but, importantly, the industries in this country that pioneered this technology will go to the other countries to produce the fuels.

Mr. GRIFFITH. Instead of making us rich?

Mr. MILLS. Correct.

Mr. GRIFFITH. Let me shift, because I only have a certain amount of time.

Mr. Freeman, I noticed in your written testimony you said that we were number one in natural gas and in a few years we would be number one in oil production but that we are number two in coal. Who is beating us in coal production?

Mr. FREEMAN. China.

Mr. GRIFFITH. And that is not an unexpected answer on my part. I have to say, that has not always been the case, has it? They have not always beaten us in coal?

Mr. FREEMAN. No, that is a very recent phenomenon.

Mr. GRIFFITH. And it is important because we heard earlier about some, you know, jobs being lost, and any job being lost is bad but I will tell you that in my district, we lost 620 coal jobs. A plant was idled within the last several weeks. And over the summer in the central Appalachian region, we have lost more than 2,000 jobs, and so that is extremely important.

You know, I was struck by some of the testimony, particularly the testimony of Mr. Weiss, that implied that those of us who advocate for North American energy independence are advocating to drill in our national parks. I don't think anyone here is advocating that we drill in the parks. You state in your testimony that parks would be vulnerable to Federal oversight of energy on public lands is eliminated in favor of more relaxed State regulations. I have to say, I have got it right here in the Romney energy plan, it speaks to States being empowered to establish processes to oversee the development and production of all forms of energy on Federal lands within their borders, but it specifically—that Romney plan, what most of us would be for, specifically excludes lands that are designated as off limits. When we talk about getting North American energy independence, we aren't talking about drilling in the parks, we are talking about leasing more than 3 percent of the Nation's Federal lands, which are quite substantial, taking—setting up government policies which would make it so, you know, it takes less than 6 years to get a permit to drill in Federal lands. I think Mr. Hamm talked about the length of time it takes if you are on Federal land to get a permit and allowing pipelines like the KXL Keystone pipeline to help bring millions of barrels of secure oil from our friends and neighbors in Canada, and I just wanted to make sure that I got the record set straight on that because I think it is important that we recognize that nobody is planning on drilling on the site where the Flight 93 crashed. That is not a part of anybody's plan, and you have said that several times, and I have to tell you, I am a little offended by that implication that anyone in this Congress or that any Presidential candidate would plan on putting an oil well at a sacred site like that. So I wanted to get that out and felt very strongly about it.

Mr. Mills, I noticed in your written testimony and in your oral testimony you said, you know, you had drill, dig, build and ship, and I have to tell you that I have the four D's which the first two are the same, drill and dig. I then have deregulate and discover. Deregulation means we have our universities trying to find ways, whether it be wind energy, algae, I don't care. I am a true all-of-the-above, that we move forward in that direction. And one of the problems that I have seen with what I think is going on in this administration, although sometimes it is hard to figure out, is that they see the alternatives as the next great step forward, and it may very well be but I find with some interest, and I wonder if you agree with me, that in all the previous revolutions on energy when we went from wood to charcoal and then we went from, you know, charcoal and wood to using oil and natural gas and coal, that each step that we have made, we didn't cut the legs out from under the older industry, we continued to use those industries, and it seems that this administration wants to eliminate the previous energy

sources with, you know, we are going to use all of the above but it has to be one of the energy sources we like because the Sierra Club has beyond natural gas now. They used to have beyond coal. They have now made us second to China. Do you agree with that general assessment?

Mr. MILLS. Yes, I think the assessment is correct. We have always used the trailing technology, so to speak. But we importantly have made them better, cheaper, cleaner by using new technologies on the old fuels. So that was the whole point of my patent research is that there is enormous opportunity for solar and wind around the world. There is no question about it. And if 20 or 30 percent of the world's energy came from alternatives, that would be marvelous—I expect it to happen—or more. But it still leaves the rest of the number, which is the 60 or 70 percent which has come from or will have to come from hydrocarbons using advanced technologies. Absolutely correct.

Mr. WHITFIELD. The gentleman's time is expired.

Mr. GRIFFITH. Thank you, Mr. Chairman.

Mr. RUSH. Mr. Chairman?

Mr. WHITFIELD. Yes, Mr. Rush.

Mr. RUSH. Would it be out of order if we had just another round for one question?

Mr. WHITFIELD. Sure.

Mr. RUSH. One question apiece?

Mr. WHITFIELD. That is a good idea. I will ask mine first.

Mr. Howard, you are the President and CEO of the Canadian Energy Research Institute. I would just like to know, what was the reaction when the Keystone pipeline permit was denied and is it the intent of Canada to at least explore building a pipeline to the west for export? Would you mind just giving me your personal impressions about all that?

Mr. HOWARD. Simply put, when it was first rejected or delayed, pretty much nobody knew what to do. That was the very first time in Canadian history that an oil pipeline had been turned down. As far as moving forward, I think the attitude in Canada is when it happens, great, but we are not going to wait.

As far as Canada exporting crude outside of the country, it is a position that the Federal and provincial governments, the industry is on board with. We are pursuing looking for other markets. That is becoming a challenge. The Northern Gateway pipeline is similar to the Keystone XL in the sense that the environmental pushback is more significant than anybody ever imagined. The Trans Mountain expansion is a little different because it is an expansion system. I personally think that will go ahead. The potential for moving bitumen from west to east to feed the eastern refineries, the eastern Canadian refineries, I think is an option. As far as if Keystone XL does not get built, I think crude or bitumen could still reach the Gulf of Mexico by tanker by going out through the St. Lawrence Seaway.

Mr. WHITFIELD. At this time I will recognize the gentleman from Massachusetts for 5 minutes, Mr. Markey.

Mr. MARKEY. Thank you, Mr. Chairman, very much.

Mr. Hamm, the oil industry gets $4 billion a year in tax breaks from the Federal Government. The wind industry gets about $4 bil-

lion a year in tax breaks for the Production Tax Credit for wind. Do you think that is fair? Do you think we should keep both tax breaks on the books?

Mr. HAMM. No, I think that our industry should be able to expense our labor costs just like any other industry.

Mr. MARKEY. No, I am asking about the wind. Do you think the wind tax breaks should stay on the books?

Mr. HAMM. I don't know. My business is not wind, and certainly I don't consider what we are getting as a tax break when it is the same as all others so, you know, what goes on with wind is a whole other business.

Mr. MARKEY. No, I got you. That is the problem that we have with the Romney tax break, you know, that Romney is going to, if he becomes President, allow the wind tax break to expire at the end of this year. Amazing, huh? And the industry says that 40,000 people will be laid off next year because of Romney's wind policy. And you know what I think? I think the fear is that the Republicans are so tied to the oil industry, you know, that they can't give up those tax breaks while at the same time maintaining a commitment to saving the taxpayers money over in the wind sector, which is going to actually install 12,000 new megawatts of wind this year, dwarfing coal, dwarfing oil, dwarfing the nuclear industry, and really, it is frightening to the fossil-fuel industry and so this completely biased oil-above-all policy, tax breaks for the oil industry and nothing for wind, that is not all of the above, that is oil above all. Oil above all. Look at all these great jobs here. These jobs are just as great as the jobs Mr. Hamm was just talking about but they can't care about these jobs, just the oil jobs. Not oil jobs? We don't care about them. And that is the kind of dual standard that the Republicans want us to accept even as oil has dropped from 57 percent imported to 45 percent imported since Bush walked out the door in January. That is arithmetic, 57 percent under Bush, imported, 45 percent today. That is a good record for Obama. That is a "drill, baby, drill" Obama administration and it is continuing to go down, 50 percent more rigs drilling in the Gulf of Mexico today than before the BP spill. Fantastic. Record highs in natural gas, wind, solar, and what do the Republicans have as their platform? Kill wind, you know, kill these renewables. That is a disaster for our country. That is the single largest domestic source of energy in our country, wind and solar, 20 and 30 years from now. Fantastic.

What else does Romney say? Romney says he doesn't like the fuel economy standards. Now, what would those fuel economy standards do on the vehicles that we drive? Fifty-four point five miles per gallon. I know because I authored the language here in the House of Representatives. That is 3 million barrels of oil per day. Where is he going to make that up from? Well, Romney says he wants to drill off the beaches of Massachusetts and California rather than have just the vehicles be more efficient while the industry is having a complete revival. This whole Romney industry plan, whoever put it together, it is a complete mess. It is upside down. It is the craziest upside-down energy policy I have ever heard, whoever put it together. It ignores the reality of what is really working and it wants to go over to kind of this age-old policy

where you have to subsidize stuff that is not working. Do you agree with me, Mr. Hamm?

Mr. HAMM. I don't agree with you at all. I think it ought to be market-based, and that is what I said earlier.

Mr. MARKEY. Subsidies for oil and no subsidies for wind is market-based? I don't think so. I don't think so. How can that be market-based? Adam Smith would spin in his grave and quality for an energy tax break, he would be so agitated that you can maintain that is market-based that oil gets a tax break and wind doesn't.

You know, when the President went down—not when the President went down. When Romney went down to Houston just 3 weeks ago and had his oil-baron summit with all those oil company CEOs, he raises $6 million from them and then says I am going to get my energy policy from them, crossing the t's and dotting the i's on my policy, he says, and then on Thursday, just 2 days later, he has a press conference, you know. And what is his press conference? Oil above all, and he doesn't support tax breaks for wind after leaving an oil-baron summit, Mr. Hamm. So how can the American people trust that energy policy to really be all of the above instead of oil above all?

Mr. WHITFIELD. The gentleman's time is expired.

I might ask the gentleman from Massachusetts, since your party controls the White House, the House and the Senate for 2 years just 2 years ago, why didn't you extend the Production Tax Credit for the wind industry? You had the power to do it. You had the authority to do it.

Mr. MARKEY. We did. We extended it.

Mr. WHITFIELD. And you didn't do it.

Mr. MARKEY. We did extend it.

Mr. WHITFIELD. Well, you could have extended it longer than the expiration at the end of this month—December. Why didn't you take that action? Romney has nothing to do with this. Romney is not in power right now.

Mr. MARKEY. Romney is letting it expire.

Mr. WHITFIELD. By the way——

Mr. RUSH. Mr. Chairman.

Mr. WHITFIELD [continuing]. Your energy department gets $538 million to——

Mr. RUSH. Point of order, Mr. Chairman.

Mr. WHITFIELD [continuing]. For the President.

Mr. RUSH. Point of order, Mr. Chairman.

Mr. MARKEY. Look at coal. Coal was 51 percent of——

Mr. WHITFIELD. And you are not interested in coal jobs, are you?

Mr. MARKEY. That is because of natural gas. Natural gas is killing coal in the free market. Natural gas is killing——

Mr. WHITFIELD. You had the opportunity to extend the Production Tax Credit.

Mr. RUSH. Mr. Chairman.

Mr. WHITFIELD. Mr. Rush, I am going to recognize you for 5 minutes.

Mr. RUSH. I don't need 5 minutes.

Mr. Mills, what do you think about this? Let me just—Mr. Mills, I do have a question for you. You had some very interesting testimony and I am really kind of inclined to lean your way, but I am

interested in why there has been no mention from you as it relates to environmental concerns. What do you think of the climate-change speed bump on this expressway that the industry is headed down? How much should we pay toward the environmental concerns or should we just ignore environmental concerns altogether?

Mr. MILLS. Thanks for the question, Mr. Rush, and I do want to make a very quick observation that I thought Congressman Markey's visual aids were the best of the hearing so far. Thank you, sir.

I would say that I know that I personally, but all the people I talk to in the industry on the broad environmental issues, there is support for safety in environmental metrics. You don't find pushback from the industry. The issues that are looked for are consistency and simplicity and adherence to standards of time, which is one of the biggest complaints I hear from industry practitioners that the deadlines aren't met.

The climate industry is an interesting one, an extraordinarily tough challenge for everybody on both sides of the aisle. I recognize that. But I would just say this as a practical matter: the fact is that we know that all the energy growth in the world is occurring outside of the United States, so if the United States ceases to exist tomorrow or consumed no energy at all or had all of its energy from non-hydrocarbons, the consumption of hydrocarbons in the world is going to go up significantly, probably by double over where it is today. So the proposition I am putting on the table is independent of whether those hydrocarbons emit carbon dioxide by definition; they do. I am simply saying that other people will supply those hydrocarbons to the world market. We can do it and make money and create jobs. We can do it cleaner and more efficiently than anybody else in the world. That is an opportunity we have inside of a reality that is locked in. The demographic reality of the rest of the world is simply locked it. More are going to be used globally. So I would love to see America be the leader in supplying those fuels for economic reasons, social reasons. It will generate all kinds of wealth which we can fund all kinds of R&D and frankly geopolitical reasons: we will have more control over world markets.

Mr. RUSH. Mr. Chairman, I yield back.

Mr. WHITFIELD. The gentleman yields back, and there seems to be no one else here to ask questions, and I think Mr. Markey is gone. Oh, Mr. Griffith. I am sorry. You are recognized.

Mr. GRIFFITH. Mr. Purcell, you make steel from coke. Can you make steel better with natural gas or coke from coal?

Mr. PURCELL. We actually use the steel for the towers that we make out of scrap metal and add the—so we are not using traditional coal and iron at the steel plant that we make the steel, but yes, there are steel mills in Indiana that are near us that do use coal, sir, and a lot of natural gas as well.

Mr. GRIFFITH. But the best stuff is still made from coke, is it not?

Mr. PURCELL. For certain steel makers, they still use an awful lot of it, yes, sir.

Mr. GRIFFITH. So when we are being beat in the world market and I lose 620 jobs in the metallurgical coalmine, that means we are doing something wrong, I would submit to you.

You know, it has been an interesting hearing and we have heard a lot of things. The bottom line is, is that we can put up all the charts we want. Apparently the wind industry has lost 1,752 jobs already yet as you heard the testimony—Mr. Markey wasn't here to hear the information I put in earlier—in my region alone, we have lost 2,000 coal jobs just this summer. So, you know, I believe in all of the above. I believe in trying to make sure that we have everything on the table and I believe that we need to make the government responsive and understand that if we just get out of the way of people like Mr. Hamm, I think that we have a very bright future in this country. We have the best workers in the world and we have the greatest supply of energy, but if we continue to throw more regulations on and more regulations on like wet blankets on the fire of enterprise, we will be doing our Nation a disservice and my children and everybody else's children and grandchildren will have a lesser America.

Thank you, Mr. Chairman. I yield back.

Mr. WHITFIELD. The gentleman yields back, so that is the end of today's hearing. I want to thank you panel members for being very patient and we appreciate your testimony very much and look forward to working with all of you as we move forward to address these issues, and we will keep the record open for 10 days, and thank you once again. That concludes today's hearing.

Mr. RUSH. Mr. Chairman, I would just like to ask one question of you.

Mr. WHITFIELD. Yes, sir.

Mr. RUSH. Can't we all just get along?

Mr. WHITFIELD. Thank you.

[Whereupon, at 12:29 p.m., the subcommittee was adjourned.]

○