



MARCH 3, 2015

21ST CENTURY ENERGY MARKETS: HOW THE CHANGING DYNAMICS OF WORLD ENERGY MARKETS IMPACT OUR ECONOMY AND ENERGY SECURITY

U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON ENERGY & COMMERCE, SUBCOMMITTEE
ON ENERGY AND POWER

ONE HUNDRED FOURTEENTH CONGRESS, FIRST SESSION

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<http://docs.house.gov/meetings/IF/IF03/20150303/103071/HHRG-114-IF03-Transcript-20150303.pdf>

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Opening Statement of the Honorable Ed Whitfield
Subcommittee on Energy and Power
Hearing on “21st Century Energy Markets: How the Changing Dynamics of World Energy
Markets Impact our Economy and Energy Security”
March 3, 2015

(As Prepared for Delivery)

Today’s hearing is entitled, “21st Century Energy Markets: How the Changing Dynamics of World Energy Markets Impact our Economy and Energy Security.” I welcome this diverse and knowledgeable panel to discuss these issues.

When it comes to energy markets, the transformation over the last decade has been dramatic. In fact, several longstanding energy trends have completely reversed themselves. America has gone from declining oil and natural gas production to unprecedented increases that now make us the world’s largest energy producer and a potential exporter. As a result, fears about rising import dependence and skyrocketing energy prices have been replaced with surging domestic supplies that are driving down prices - so low in fact that they are now discouraging additional drilling in the U.S.

The downstream changes have been every bit as dramatic. Domestic refineries, a number of which were optimized to handle imported crude, now have the option of transitioning to use more North American oil. And for manufacturers, the offshoring trend has stalled, and in fact some of the manufacturing capacity that had been forced overseas by competitive pressures is now returning to the U.S. because of the low energy prices. And North America’s new energy supplies have necessitated a major infrastructure build-out in order to deliver this energy to the consumers and businesses that need it.

The changes also have significant geopolitical implications. Many of our energy-importing allies were resigned to growing dependence on OPEC and other unfriendly exporters like Russia, but now they see America as a potential new source of reliable and affordable energy supplies. As a result, America has the opportunity to fight back against the geopolitical influence of the countries that used to dominate global energy markets, and exert our own influence instead.

There is no question that the America’s oil and natural gas boom has been very good news for America, but that is not to say that it doesn’t bring new concerns – we have simply traded one set of challenges for another. Unfortunately, our energy policy is largely based on old laws rooted in assumptions of scarcity, and may no longer be up to the task of addressing these new challenges and taking full advantage of emerging opportunities.

We explored one such landmark law, the 1975 Energy Policy and Conservation Act, in a hearing last December. At the hearing, we learned more about the energy policy context under which this 40-year old statute was enacted, and how its provisions may no longer be relevant.

Today, we continue the discussion by further exploring current and evolving energy market dynamics. We hope to be able to better assess where we are and what new policies may be needed. Our existing energy policy was not created overnight, nor will any changes to it happen overnight. This will be a thorough and deliberative process, and one in which all affected parties will be heard.

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Opening Statement of the Honorable Fred Upton
Subcommittee on Energy and Power
Hearing on “21st Century Energy Markets: How the Changing Dynamics of World Energy
Markets Impact our Economy and Energy Security”
March 3, 2015

(As Prepared for Delivery)

Energy markets are changing, and they're changing for the better. America is producing more while using and importing less, and the energy boom is translating into a jobs boom – not just in energy production but also energy infrastructure and manufacturing.

The combination of increased domestic oil supplies and decreased demand not only strengthens our energy security, but also presents new opportunities for energy diplomacy. The days of energy-exporting aggressors like Russia exerting uncontested geopolitical influence may be numbered now that America is emerging as an energy superpower.

While the overall effects of our domestic energy abundance are overwhelmingly positive, they do create some challenges and complications when viewed under the lens of our existing federal energy policy. For example, the recent drop in oil prices has been great news for folks in Michigan and across the country who are finally getting a break at the gas pump after several years of prices above three bucks a gallon. But at the same time, current prices pose a challenge for producers, their employees, and the communities in which they live. In fact, some energy workers have already lost their jobs.

Couple these changes with a new global petroleum landscape of enduring complexity and emerging volatility, and it only further reinforces the point that the time to examine these issues is now. Clearly, the changes in energy markets affect different parties in different ways, and Congress needs to be aware of all of the impacts before considering any modifications to energy policy.

That is why we took a very careful and deliberative approach on the issue of natural gas exports. For more than a year before we proposed legislation to expedite LNG export approvals, we thoroughly studied the potential impacts on natural gas producers and on users like manufacturers and consumers. We acted only after listening to all interested parties and concluding that LNG exports would be beneficial for the economy and a net jobs creator.

We also heard from many foreign policy experts and embassy officials about LNG exports and concluded that they promised significant geopolitical benefits. And I would note that with Russia once again threatening to cut off Ukrainian natural gas supplies, I believe that enactment of our LNG bill can't come soon enough.

When it comes to revisiting the 40-year old restrictions on oil exports, we will take the same deliberative approach. We recognize that the export of oil and other liquid hydrocarbons presents different issues than natural gas. That is why we again are undertaking a thorough review and will consider all perspectives – including producers, refiners, and consumers. That is the purpose of today's hearing and also why we are soliciting public comments on changing energy markets. If we choose to change the law on exports of oil and other liquids, it will only happen after an open review of the current policy.

America's energy abundance has greatly changed energy markets and presents a number of new opportunities, and we will carefully consider our approach to all of them.

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STATEMENT OF ADAM SIEMINSKI

ADMINISTRATOR

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U.S. DEPARTMENT OF ENERGY

Before the

COMMITTEE ON ENERGY AND COMMERCE

U. S. HOUSE OF REPRESENTATIVES

MARCH 3, 2015

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to appear before you today as you consider how the changing dynamics of world energy impact our economy and energy security.

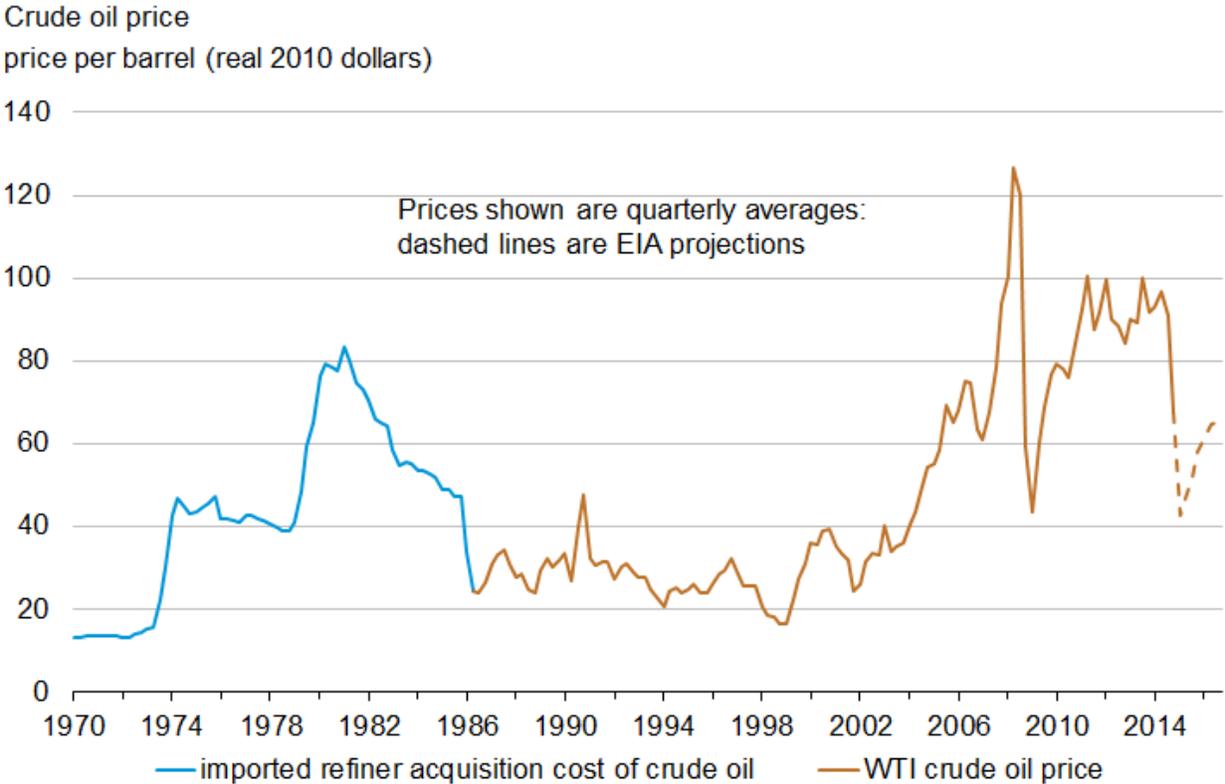
The U.S. Energy Information Administration (EIA) is the statistical and analytical agency within the U.S. Department of Energy. EIA collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding regarding energy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

As requested, my testimony focuses on EIA's oil market outlook, including supply, consumption, prices and the relationship between energy market developments and the economy, drawing on information from EIA's most recent Short-Term Energy Outlook (STEO) and our other data and analysis products.

OIL PRICES

Since the middle of last year, the global supply of crude oil and petroleum products has exceeded consumption, leading to growth in global oil inventories. From their 2014 high point in June, prices fell as the worst fears of the impact of the so-called Islamic State on Iraq's oil production failed to materialize, U.S. production continued to grow robustly, and significant Libyan supplies unexpectedly returned to the market for several months starting in late summer. At the same time, global oil demand growth and expectations for future demand growth were reduced as data from key markets, including China, showed economic growth coming in below consensus expectations at the start of 2014. EIA estimates that commercial oil inventories held by countries in the Organization for

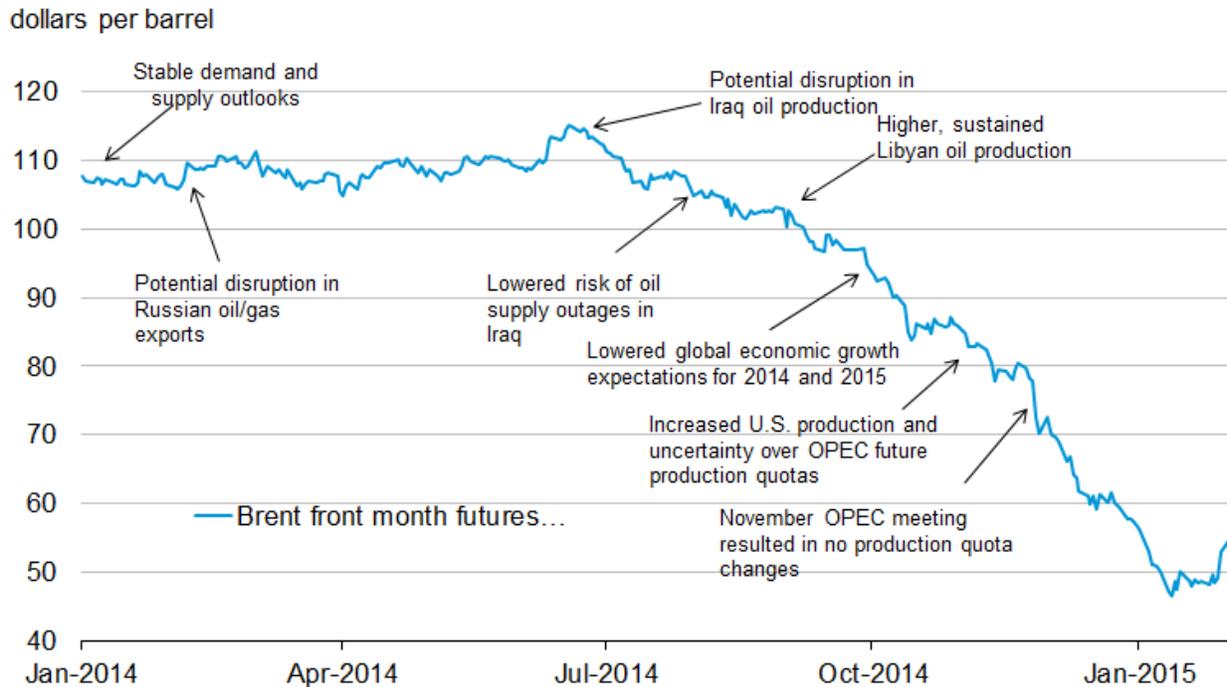
Economic Cooperation and Development (OECD) at the end of January were 203 million barrels (8%) higher than the same time last year, the largest year-over-year increase in at least the last three decades. Put in historical context, this recent inflexion point in oil markets is not the first. The global oil market has experienced a number of significant upward and downward price movements over the last 40 years.



Sources: U.S. Energy Information Administration, Thomson Reuters

By January 2015, the monthly average West Texas Intermediate (WTI) crude oil spot price had fallen from a peak monthly average of \$106 per barrel (/b) in June to an average of \$47/b, and North Sea Brent crude oil had fallen to \$48/b, the lowest levels of these benchmark crudes since early 2009. Prices rebounded in February, with Brent and WTI prices averaging \$58/b and \$51/b respectively,

reflecting a significant widening of the spread between Brent and WTI as U.S. crude oil inventories have rapidly increased. The recent rise likely reflects some optimism regarding the pace of global market rebalancing, including lower rig counts and capital expenditures on the supply side, and some recent positive news on the global demand side.



Source: EIA, Bloomberg

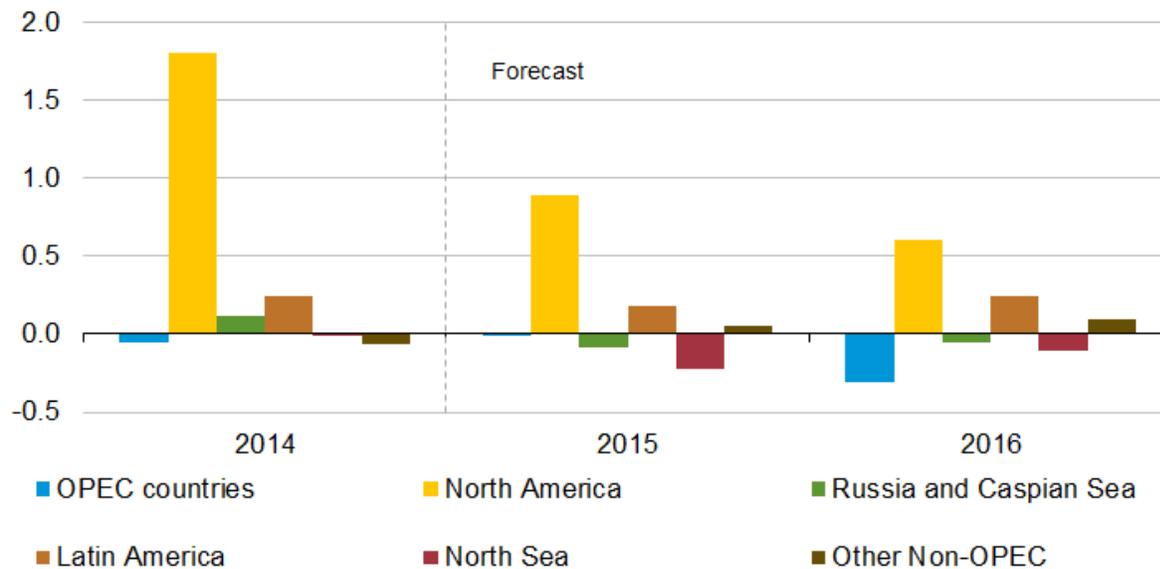
Recent values of futures and options contracts suggest very high uncertainty in the price outlook – the implied 95% confidence interval for market expectations for WTI prices in December 2015 calculated for the current STEO ranges from \$32/b to \$108/b. In the absence of further sanctions or unplanned disruptions, EIA’s STEO forecast for WTI prices averages \$55/b in 2015, down from the average price of \$93/b in 2014. The forecast price decline reflects an expected average global inventory build of 600,000 barrels per day (b/d) in 2015, peaking at over 1.1 million b/d during the second quarter. EIA’s WTI price forecast averages \$71/b in 2016. In EIA’s forecast, the discount of WTI to Brent averages \$3/b in 2015 and \$4/b in 2016.

GLOBAL OIL SUPPLY

Global supply of crude oil and other liquids grew 2.1 million b/d in 2014 despite unchanged total production from member countries of the Organization of the Petroleum Exporting Countries (OPEC). The United States was the main contributor to global supply growth, adding 1.6 million b/d including 1.2 million b/d of increased crude oil supply.

In 2015 and 2016, non-OPEC supply continues to grow under EIA's price forecast, but more slowly than in recent years, with year-over year growth averaging 0.8 million b/d annually. The slower growth in non-OPEC supply is largely attributable to slower production growth in the United States, Canada, and South America.

World crude oil and liquid fuels production growth
million barrels per day



Source: EIA, *Short-Term Energy Outlook*, February 2015

Year-over-year supply growth figures may not reflect the most current trends at times when oil production growth is changing rapidly. While U.S. production of crude oil (not all liquids) averaged an estimated 8.6 million b/d for all of 2014, production in December 2014 was significantly higher at 9.1 million b/d. EIA's forecast for U.S. crude oil production averages 9.3 million b/d in 2015, with average production rising to 9.5 million b/d in 2016 given EIA's price forecast, which is close to the highest annual production in U.S. history of 9.6 million b/d in 1970.

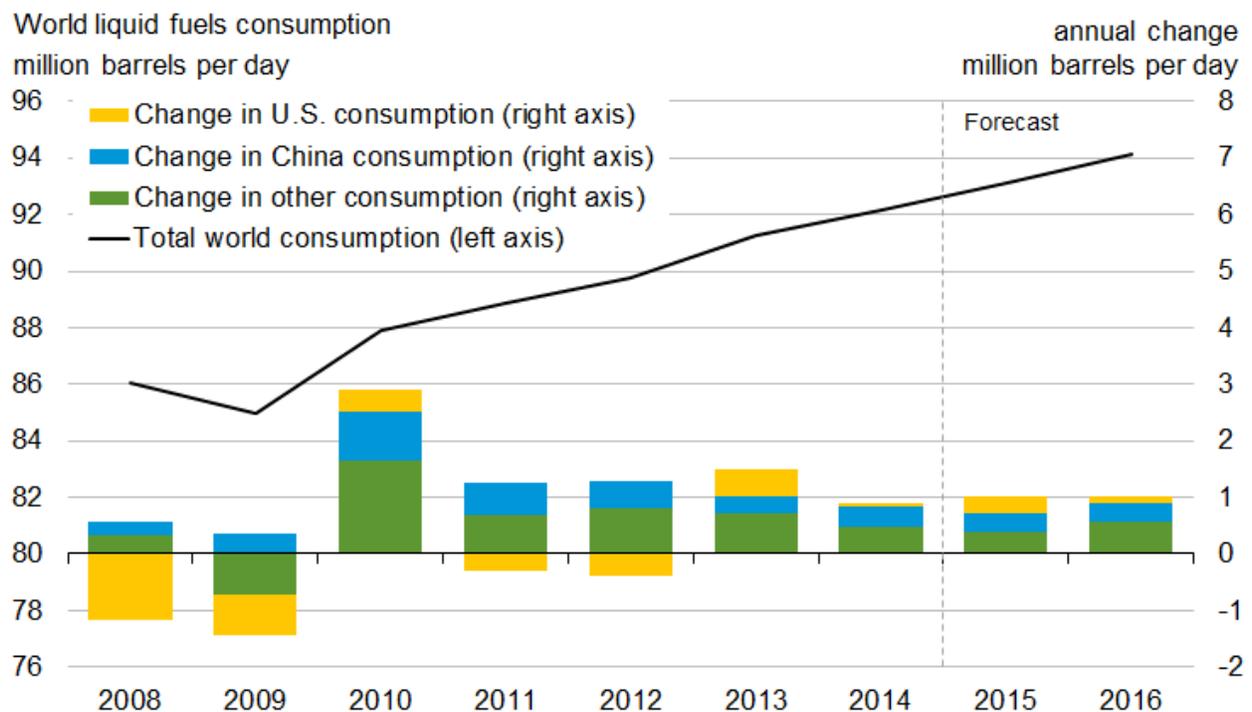
EIA expects onshore drilling activity to decline in 2015 as a result of less-attractive economic returns in some areas of both emerging and mature oil production regions. Many companies will redirect investment away from marginal exploration. However, projected oil prices remain high enough to support some continuing development drilling activity in the Bakken, Eagle Ford, Niobrara, and Permian Basin, which contribute the majority of U.S. oil production growth. EIA expects 2015 production will continue to grow in the second quarter, then decline in the third quarter. With projected WTI crude oil prices rising in the second half of 2015, drilling activity is expected to increase again as companies take advantage of lower costs for both leasing acreage and drilling and completion services. Projected production for the federal offshore region and Alaska, which rise and fall respectively in both 2015 and 2016, are less sensitive to short-term price movements than onshore production in the Lower 48 states.

EIA estimates that OPEC crude oil production averaged 30.1 million b/d in 2014, unchanged from the previous year. Crude oil production declines in Libya, Angola, Algeria, and Kuwait more than offset production growth in Iraq and Iran. EIA expects OPEC crude oil production to fall by 0.1 million b/d in 2015, and to fall by 0.4 million b/d in 2016. Iraq is the largest contributor to OPEC production growth over the forecast period, but its growth is expected to be offset by production declines from other OPEC producers.

Unplanned OPEC crude oil supply disruptions averaged 2.4 million b/d in 2014, 0.6 million b/d higher than in 2013 and contributed to higher crude oil prices during the first half of 2014. Libya and Iraq accounted for almost all of the growth in OPEC disruptions. Changes in the level of unplanned outages, either up or down, could still affect crude oil prices going forward.

GLOBAL OIL CONSUMPTION

EIA estimates that global oil consumption grew by 0.9 million b/d in 2014, averaging 92.1 million b/d for the year. EIA expects consumption to grow 1.0 million b/d in both 2015 and 2016. Projected global oil-consumption-weighted real gross domestic product (GDP), which increased by an estimated 2.7% in 2014, is projected to grow by 2.8% in 2015 and by 3.2% in 2016.



Source: EIA, Short-Term Energy Outlook, February 2015

Non-OECD Asia accounts for more than 50% of forecast oil consumption growth over the next two years. Chinese oil consumption, the main source of the growth, is projected to increase in 2015 and

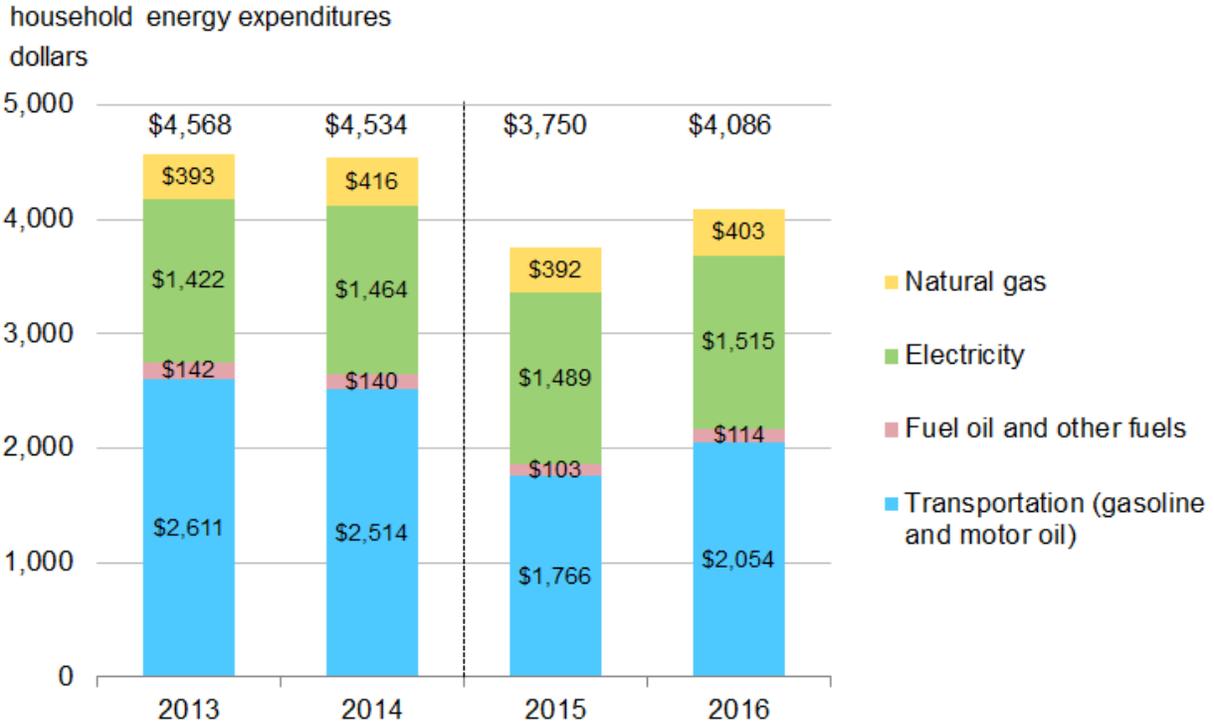
2016, but at a lower rate than in 2014. Projected declines in Russia's oil consumption because of its economic downturn also contribute to lower non-OECD consumption growth over the forecast period compared with 2014.

OECD consumption, which fell by 0.3 million b/d in 2014, is expected to rise modestly in 2015 before declining slightly in 2016. The United States is the leading contributor to projected OECD consumption growth, with U.S. consumption increasing by 0.3 million b/d in 2015 and by 0.1 million b/d in 2016. Demand in Japan and Europe is expected to continue declining over the next two years, albeit at a lesser rate than in 2014.

THE ECONOMY AND CONSUMERS

EIA's energy forecast reflects a U.S. economic growth outlook for 2015-16 that is somewhat stronger than the 2013-14 experience. Energy expenditures as a share of GDP are forecast at 6.2% in 2015, their lowest level since 2002, reflecting both lower oil prices and ongoing increases in energy efficiency.

Consumers are receiving a direct benefit from lower oil prices. EIA expects U.S. regular gasoline retail prices, which averaged \$3.36/gal in 2014, to average \$2.33/gal in 2015. Based on gasoline expenditures reported in the Consumer Expenditure Survey (CES), the average household is now expected to spend about \$750 less for gasoline in 2015 than in 2014 because of lower prices. Many households that have more than one vehicle and/or have higher than average miles traveled will save substantially more than the average value reported for all households, which includes the 13% of all households that do not own or lease even one vehicle.



Sources: 2013 expenditures and income from BLS Consumer Expenditure Survey. The average household in the BLS survey (called a consuming unit) averages 2.5 people and 1.3 income earners. Expenditures for 2014-16 based on average prices from EIA Short-Term Energy Outlook, February 2015

Consumers who heat with propane or heating oil, which together are used as the primary heating fuel in about 11% of American homes, are also likely to see significant cost savings compared to last winter during the current (2014-15) winter. The expenditure savings for fuel oil and other fuels for the average household in the expenditures figure reflect the average savings of all households; the savings for households actually using those fuels are roughly 10 times larger.

INITIATIVES TO IMPROVE ENERGY INFORMATION

I would like to share with the Subcommittee information on a number of important initiatives EIA is pursuing related to the timeliness and detail of oil market data. These efforts are particularly important given the need for policymakers, industry, and the public to closely track rapidly changing developments. EIA just launched its first-ever monthly survey to collect oil production data directly

from operators. In addition to providing a better estimate of the volume of monthly production, this survey will include information on the quality of oil being produced. EIA had previously obtained production data from the states, which have varying lags and gaps in their own data collection programs and had almost no access to data on oil quality, an important consideration in discussions regarding the possible relaxation of current limitations on U.S. crude oil exports. EIA is also providing technical assistance to oil and natural gas producing states through the Groundwater Protection Council (GWPC), which is developing a unified national database of well-level data.

Later this month, EIA plans to begin publishing monthly information on the movement of crude oil by rail, which has grown dramatically in recent years. We are also working with our counterparts from Canada and Mexico on validating data on cross border flows of energy by all modes, improved infrastructure mapping and outlooks for traded energy. This trilateral effort was started with the signing of a Memorandum of Understanding (MOU) by Secretary Moniz and his counterparts from Canada and Mexico. Collectively, these efforts support EIA's commitment to provide timely, accurate, and relevant information at a time when there are many new developments in the sector.

LINKAGES BETWEEN U.S. AND GLOBAL ENERGY MARKETS

As we work to keep up with rapidly changing energy markets, one set of questions we face involves the relevance of international energy markets to the United States as our oil and natural gas production surges, and our net dependence on energy imports declines. Despite these trends, the connectedness of the United States to global energy markets is actually increasing in some important respects.

Notwithstanding declining U.S. net oil imports, producers in the countries of the Persian Gulf region, who hold very large reserves of easy-to-develop oil, will continue to play a central role in oil markets.

Developments in that region and decisions made by producers affecting both production levels and the development of their resources have a direct effect on oil prices that in turn affect producers and consumers everywhere, including the United States. Global interconnections are also readily apparent on the demand side of oil markets. The United States, already the world's largest exporter of petroleum products, has a keen interest how overseas demand for various petroleum products will evolve. More broadly, future trends in global oil demand largely hinge on the rate of consumption growth in the Middle East and non-OECD Asia, including but not limited to China and India. Demand as well as supply will be a key influence on future oil prices, with outcomes having direct implications for both U.S. producers and consumers.

Natural gas markets are also increasingly interconnected. Not long ago, the North American natural gas market, dominated by the United States, was largely isolated from other global regions. The advent of shale gas, which greatly increases the U.S. resource base, could allow the United States to be a significant exporter of liquefied natural gas. The extent to which this actually happens will depend significantly on natural gas demand, supply, and price conditions throughout the world, as well as on future oil prices, given competition among fuels and the use of oil-linked price contracts. Provided that market conditions favor investment in liquefaction capacity to support higher levels of U.S. LNG exports, decisions by policymakers regarding the approval of proposed projects will also come into play.

Faced with the rising connection between U.S. and global energy markets, EIA's efforts to analyze developments in U.S. energy markets increasingly hinges on our ability to understand their linkage to developments outside our borders. In the face of this challenge, we are redeploying some resources to improve our international data and analysis capabilities.

Thank you again for the opportunity to testify before the Committee.

Summary
Testimony of John Kingston
President, McGraw Hill Financial Institute
House of Representatives Energy & Commerce Committee Subcommittee on Energy &
Power
"21st Century Energy Markets: How the Changing Dynamics of World Energy Markets
Impact our Economy and Energy Security"
March 3, 2015

Supply and Demand Explains Recent Drop In Oil Prices

- Unlike past boom-bust cycles, the current slide in oil prices is mainly attributable to the growing imbalance between supply and demand. One recent estimate put the amount of capacity on the sidelines is 4.5 million barrels per day. The natural gas boom has been an important factor in price drops in the U.S. as it has made natural gas prices more competitive with other forms of energy.

• Impact Of Oil Prices On The Industry

- S&P Ratings Services (S&P) is seeing, on average, a 35 percent reduction in capital expenditures (CAPEX) from exploration and production (E&P) companies. Halfway through the first quarter of 2015, S&P Ratings Services has downgraded 26 oil and gas companies—the largest number of oil and gas downgrades over a single quarter since 1999, when 28 were downgraded. A majority of these companies are based in the U.S. Without a meaningful pricing rebound in 2016, we could see increasing issuer defaults.

• Impact On Jobs And The Economy

- It's important to note that the oil and gas sector represents 200,000 U.S. jobs, or 0.14 percent of the 140 million jobs in the U.S. economy. That being said,

jobs losses in the oil and gas extraction industry reached 2,000 for the month of January. Regions that are heavily reliant on the energy sector could see a negative impact on employment and local economies.

- In the near term, low oil prices are a boon for the U.S. economy, according to a recent report by S&P U.S. Chief Economist Beth Ann Bovino and her colleague, U.S. economist Satyam Panday. A \$50 drop in the price of oil translates to a \$240 million decline in oil imports every day, S&P estimates. This results in savings of about \$87.6 billion of savings annually.
- Gasoline prices have fallen \$1 per gallon. Considering that the typical American household buys more than 1,000 gallons of gasoline each year that means each household has an extra \$1,000 to spend. If all of this were spent the "gas dividend" would be up to two-thirds of a percentage point of GDP.

Testimony of John Kingston

President, McGraw Hill Financial Global Institute

Before the

U.S. House of Representatives

Energy & Commerce Committee

Subcommittee on Energy & Power

Hearing on: 21st Century Energy Markets: How the Changing Dynamics of World Energy
Markets Affect our Economy and Energy Security

March 3, 2015

Chairman Whitfield, Ranking Member Rush, and members of the Subcommittee, good afternoon and thank you for inviting me to share the views of the McGraw Hill Financial Global Institute (The Institute).

My name is John Kingston, and I am the newly-appointed President of The Institute, as well as the company's Director of Market Insights. The Institute is McGraw Hill Financial's (MHFI) thought-leadership platform.

MHFI provides independent benchmarks, credit ratings, portfolio and enterprise risk solutions, and analytics, and is home to some of the most iconic brands in U.S. finance, economics, and business, including Standard & Poor's Ratings Services, S&P Capital IQ, S&P Dow Jones Indices, Platts, and J.D. Power.

From the Industrial Revolution to the Digital Revolution and beyond, our core values – fairness, integrity, and transparency – have remained constant. This commitment ensures we best help individuals, markets, and countries grow and prosper by meeting critical needs for data and insight.

Prior to being appointed President of the Institute, I spent more than 29 years with Platts, the MHFI brand that provides the energy industry with independent news, analysis, and

benchmark price assessments that are used as the basis for billions of dollars in energy commerce throughout the globe.

Today, I hope to provide you with helpful insights from all of our brands, as well as additional unique insights from my role as Director of The Institute. Thank you for having me.

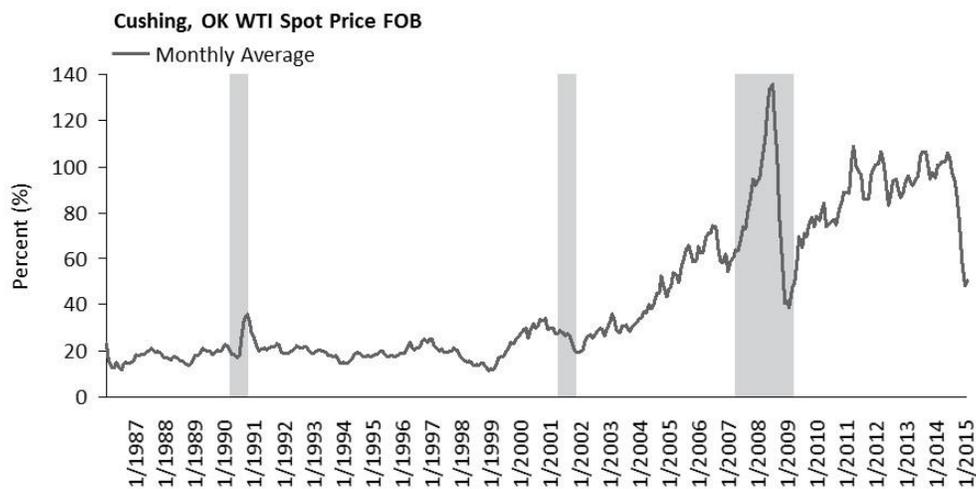
Over the last 30 years, oil prices have seen several booms and busts. However, the price slide of recent months is like no other. In 1998-99 the boom bust cycle could be attributed mostly to the Asian financial crisis and a collapse in demand from that region. The price collapse of 1985-86 bears more resemblance to the current cycle. Key producers like Saudi Arabia were determined to recapture market share against a backdrop of some increases in supply and some cuts in demand. Despite the similarities, the mid 80s did not feature the enormous North American-generated increases in supply and slide in prices we are witnessing today. I'll discuss that more shortly.

While the Saudis and their Gulf allies are determined to hang on to market share this time, this is not the immediate reason for the price decline. Instead, it is the growing imbalance between supply and demand that finally combined this year to send the market plunging (Exhibit 1). It would have happened earlier had there not been so much disruption of international supply lines due to various political reasons. Once Libya came back toward 1 million barrels per day (b/d) in June and July, that tenuous balance could hold no more. It's interesting to note that since the surge out of Libya that country's output has fallen back significantly, yet the price remains at depressed levels.



The Price Of Oil

It is the growing imbalance between supply and demand that finally combined this year to send the market plunging.



The amount of capacity that is on the sidelines because of political issues is staggering. One recent estimate put it at 4.5 million b/d. It starts with small countries like the South Sudan and Syria, and rises up to outages close to 1 million b/d in Iran (due to sanctions) and Libya (due to civil war). And this does not even take into account that political mismanagement of a country's industry can and sometimes has given it a productive capacity far less than what it should be (Venezuela is in this category). If there was any sort of significant move toward quiet in these areas, since the costs of production in most of those regions are all significantly less than in the U.S., oil prices would come under even greater pressure.ⁱ

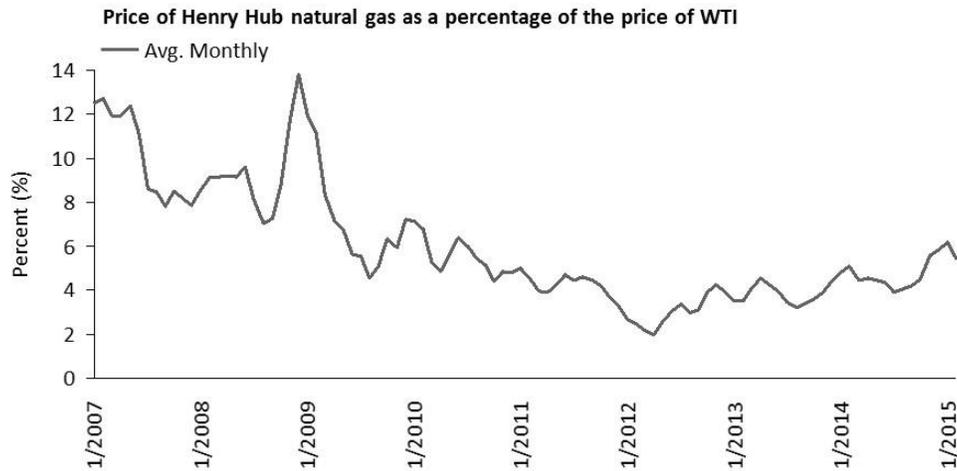
That said, while there are global factors contributing to the drop in oil prices, none compare to the scale of what the U.S. shale revolution has done in just a few short years. About this time six years ago – during the financial crisis and following the collapse of oil prices from their mid-2008 run at \$150 per barrel – the price of crude began a slow rise that continued for five years. But it was not concurrent with a rise in U.S. natural gas prices. The price of U.S.

oil and natural gas has never had a 1:1 correlation, but they historically tended to trend together. Lately they have not (Exhibit 2).



Natural Gas Relative To Crude

It's cheaper to produce a BTU of energy from natural gas relative to crude today than it was back before the start of 2009.



The shale boom that first led to a surge of natural gas supplies had begun to yield new flows, but because of the need to transport natural gas by pipeline these supplies essentially became stranded in the North American market. This slowly but inexorably led to rising U.S. competitiveness for a bevy of industries that use natural gas as a feedstock, from fertilizers to chemicals to smaller niche products that brought manufacturing back to the U.S. after a long absence. Direct reduced iron, a steelmaking feedstock, is a small but near perfect example of this. Indirectly, it slowed increases in the price of gas-generated electricity, but also slowed increases in coal-generated electricity prices, as gas became a competitive fuel against coal use. Other countries' natural gas prices were directly or indirectly linked to oil prices, making the U.S. prices the most competitive in the world.

When talking about U.S. competitiveness on energy, it's important not to forget that natural gas is what gives the U.S. an enormous edge. Because it's a pipeline-delivered product, it is only slightly part of a global market. Liquid Natural Gas (LNG) shipments are not enough to tie it fully to other markets. So you first had natural gas break away from its loose correlation with oil back in 2009, and, even with the fall in oil recently, that relationship remains at a level that makes natural gas consumption in the U.S. far more competitive than gas consumption in the rest of the world.

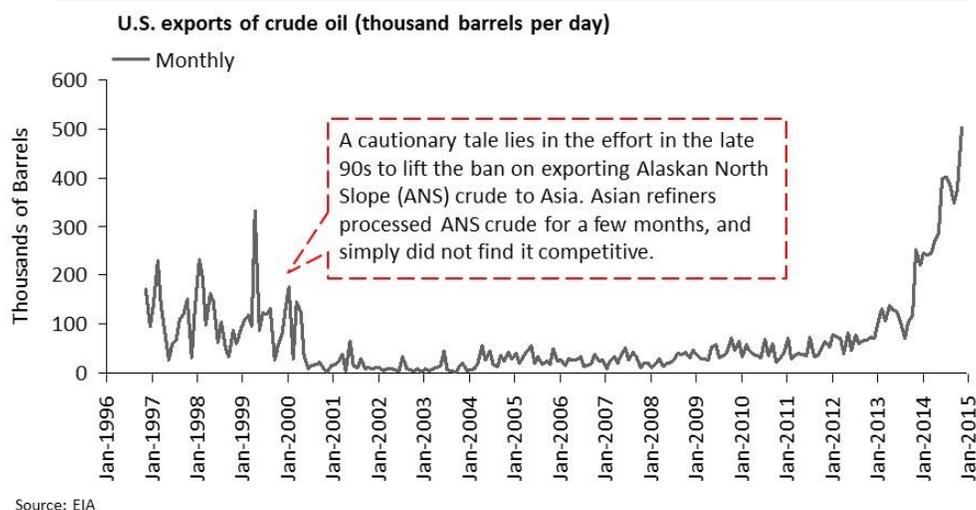
Most important to note today is the duration of this revolution: six years and counting. In terms of economic transformation, six years is just a warm-up. The changes in the U.S. resulting from these added flows have just begun.

As far as how U.S. crudes would fare abroad if they were allowed to be exported, it's safe to say that some refiners probably have models, but they aren't widely distributed. The rise in U.S. crude oil exports to Canada, mostly via rail, indicates that Canadian refiners are finding U.S. crudes to be attractive. If they weren't, export numbers would be falling, not rising. But a cautionary tale lies in the effort in the late 90s to lift the ban on exporting Alaskan North Slope (ANS) crude to Asia. That battle went on for several years, and, finally, the ban was lifted. Asian refiners processed ANS crude for a few months, and simply did not find it competitive. So if you look at the export data, you see this surge in exports that last for a few months, and then it drops back toward zero (Exhibit 3). So, as to how U.S. crudes would do battle in an international market if export bans were lifted, all we can say is: we'll see.



U.S. Exports Of Crude Oil

It's not clear how U.S. crudes would do battle in an international market if export bans were lifted.



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3

Ultimately, a free market finds the best locations for any commodity to be consumed. So if a ban is lifted and U.S. crude doesn't go anywhere, that's probably a signal from the market that the rest of the world is better off consuming non-U.S. crudes. But the fact that the crude can be exported will help make a more competitive market. It's always out there as, at least, a potential source of supply.

Just a few weeks ago, MHFI President and CEO Doug Peterson gave a speech at nearby Georgetown University's Law School on how the state of U.S. infrastructure is badly in need of repair. He also discussed infrastructure's linkages to the economy and, specifically, the energy sector. He stated, "Infrastructure makes energy development possible and provides the tools necessary for its extraction, transportation, and transformation. Infrastructure moves people, fosters urbanization, and catalyzes development through roads, rail, airports, and water transportation. Infrastructure provides a logistical framework for purchased goods to reach their

consumer. Infrastructure connects people and provides the broadband, satellite, and internet support system for our world to function at the highly-efficient rate that it currently does."

I stress this because there is current discussion about the additional need for infrastructure, in order to keep production levels high enough to sustain a competitive environment.

I'll now turn my focus to the impact the current pricing environment is having domestically.

In regards to U.S. producers, and based on earnings calls, MHFI subsidiary S&P Ratings Services (S&P) is seeing, on average, a 35 percent reduction in capital expenditures (CAPEX) from exploration and production (E&P) companies. Ranges have gone as high as 50 percent reductions for firms with lower credit quality to as low as 10 percent for the major producers. Many are targeting running CAPEX at maintenance production levels.ⁱⁱ

In the E&P space, S&P is particularly concerned about liquidity for 'B' rated issuers. Note that companies rated lower than a BBB- are what S&P refers to as speculative grade as opposed to those rated higher than BBB, which are referred to as investment grade.ⁱⁱⁱ These speculative-rated issuers rely on reserve-based borrowing credit facilities, which have borrowing limits determined by commercial bank's price decks and reserves to fund CAPEX.

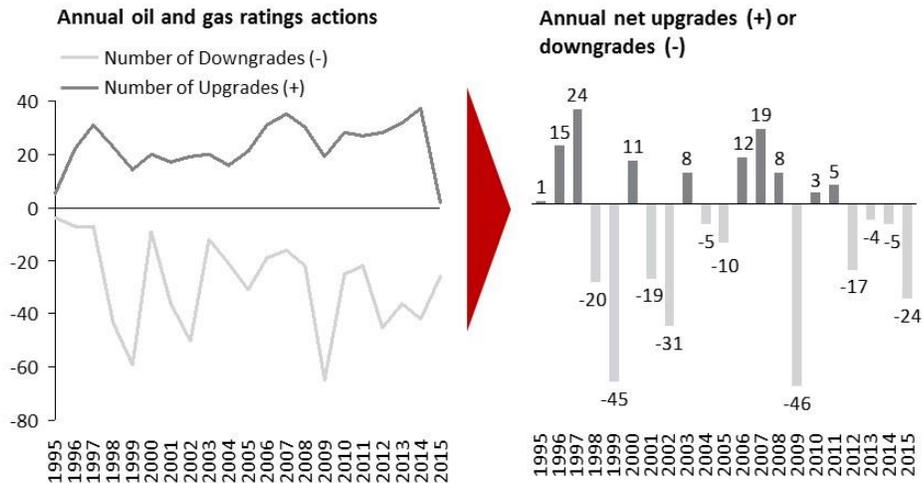
Halfway through the first quarter in 2015 (as of mid-February) S&P has downgraded 26 oil and gas companies – the largest number of oil and gas downgrades over a single quarter since 1999 when 28 were downgraded.^{iv} Additionally, a majority of these downgrades were in the U.S.

While speculative grade companies will bear the brunt of oil price volatility, it should be noted that a majority of the recent U.S. downgrades are somewhat mitigated by the number of relatively recent upgrades that occurred across the sector (Exhibit 4). For instance, upgrades in the U.S. reached a 2014 high in the fourth quarter.



Net Upgrades (+) or Downgrades (-)

While the majority of recent downgrades were in the U.S., these downgrades have been somewhat mitigated by upgrades in 2014



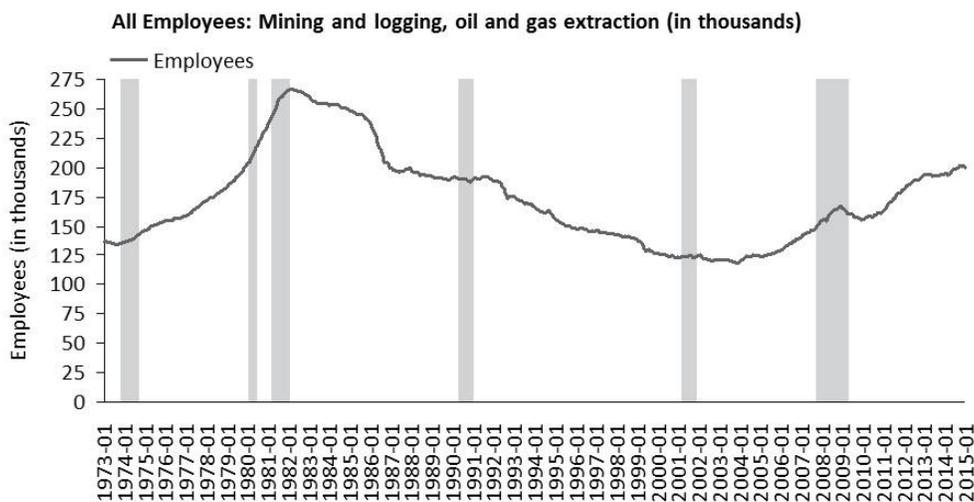
In order to preserve liquidity, many companies are hunkering down and reducing CAPEX to maintenance levels (keeping production flat) and many have hedges in place for 2015 and long-dated maturity schedules. However, with decline curves so steep, producers inevitably will be forced to reinvest to replenish depleting reserves and production, most likely requiring capital market access. Without a meaningful rebound in pricing in 2016, we could see increasing issuer defaults.

In 2015, as I have stated, S&P does not expect the price impact on companies to translate to significant defaults, although reducing CAPEX certainly affects the employment market. The oil and gas sector has been aggressively adding jobs during the economic recovery (Exhibit 5). Job growth for the oil and gas industry was 39 percent as opposed to the 8 percent growth for the U.S. overall.



Steady Job Gains Since The Recession

The oil and gas sector has been aggressively adding jobs during the recovery, far outpacing the national job growth.



That said, the oil and gas extraction industry showed job losses of 2,000 for the month of January. This was the highest monthly loss since the recession. Moreover, regions that are heavily reliant on the energy sector could see a greater negative impact on employment and their surrounding economies. The recent Challenger report showed a spike in layoffs in January, which were predominately concentrated in the state of Texas. According to the employer survey, over 40 percent of job cuts were attributed to the change in the price of oil.

However, the oil and gas sector, by itself, only represents 200,000 U.S. jobs. This is just 0.14 percent of the 140 million jobs in the U.S. economy. Energy capital expenditures of \$183 billion equal roughly just 1 percent of the U.S.'s \$17.6 trillion GDP. And while the impact of oil prices will differ based on a region's concentration, and the oil and gas industry's supply chain, low oil prices, in the near term, is a boon for the overall economy, according to a recent report by S&P's U.S. Chief Economist Beth Ann Bovino and her colleague U.S. economist Satyam Panday.^v

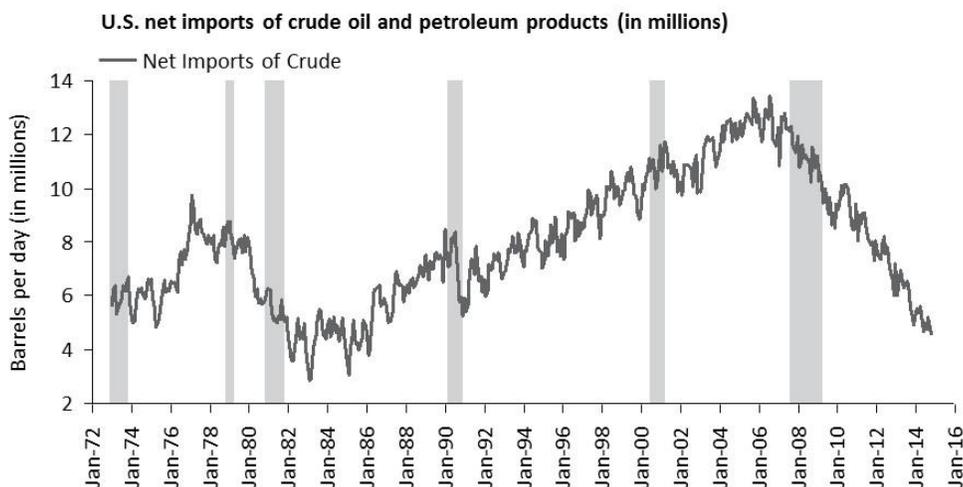
According to the report, the recent decline in oil prices is a result of a combination of supply and demand shocks but weighted slightly higher on the supply side. The key is that the U.S. is not leading the demand shock, rather, it's a foreign one. See, when there's a positive supply shock, as there is today, it leads to a transfer of income from oil exporters to oil importers. Demand shocks, on the other hand, tend to lead to weaker effects. While the outlook for domestic demand in the U.S. is expected to remain solid, the opposite is expected for foreign demand.

Because the U.S. is still a net importer of oil (Exhibit 6), part of each dollar spent on petroleum is sent abroad and doesn't contribute to domestic production, employment, or U.S. GDP. The positive "terms of trade" shock of lower oil prices in the U.S. means that less money is sent abroad and therefore stays within the economy. It then becomes available for consumption and production, which supports domestic jobs and GDP.



U.S. Net Imports Of Crude

The positive "terms of trade" shock of lower oil prices for the U.S. means less money is sent abroad.



While the magnitude of this positive "terms of trade" shock is lower today than it was several years ago – the U.S. has cut its oil import levels by more than half – it is still a net positive. S&P estimates that a \$50 drop in the price of oil calculates to a \$240 million decline in oil imports every day. This translates to about \$87.6 billion of savings per year. The overall impact to the economy, however, will depend on how much of these savings will be spent versus parked in the bank.

The typical American households buys more than 1,000 gallons of gas each year and, since last year, gas prices have fallen \$1 per gallon. Therefore, households would have at least an extra \$1,000 to put toward other expenses or pay down existing debt this year. If all of this were spent, the "gas dividend" would be up to two-thirds of a percentage point of GDP all else being equal.

To add, gasoline expenditures make up a higher proportion of disposable income for lower-income households. Therefore, falling energy prices disproportionately raise real incomes for a large majority of Americans. The "gas dividend" would most likely be spent, given this dynamic.

Although time will tell, the large decline in gasoline prices appears to have raised consumer confidence. Both the University of Michigan Consumer Sentiment and Conference Board Consumer Confidence indices have risen sharply in the past few months. This is additional rationale for why a majority of the savings would lead to household consumption rather than savings.

For sectors and industries outside of energy, the lower energy prices reduce the cost of doing business, all else being equal. For example, the transportation, petrochemicals, agricultural, and manufacturing sectors are major beneficiaries. Many of the leading investment indicators that are so closely tied to perceptions from manufacturing and non-manufacturing (excluding energy) manager surveys support this view and expect a pick-up in business investment.

Recently, S&P looked at state budgets and their dependencies on the energy industry.^{vi}

While some states are heavily reliant on the industry from an employment perspective, many of their budgets are not. In the short term, at least, state operating budgets appear safe. In the long term, however, given a long-term secular slide in oil prices, states will have to react by altering their fiscal management. No two states are alike; even ones with similarly size oil producing industries. Therefore, many questions need to be answered, primarily:

- What oil price and production level did the state assume in its budget?
- How much does the state's operating budget rely on oil-related tax revenue?
- Did the state use prior period of high oil prices to accumulate reserves?

Lastly, I'd like to quickly touch on an issue out in California that our Platts brand is following.^{vii} I do this purely to provide the subcommittee members helpful information. An ongoing labor strike and an explosion at a major California facility may compel U.S. West Coast refiners to seek a Jones Act waiver from the Obama administration.^{viii} While the application process is confidential, government sources said that no company has formally applied for a Jones Act waiver. But market and legal sources said ExxonMobil is considering such a request amid climbing prices and supply shortages. The Jones Act, enacted as the Merchant Marine Act of 1920, requires all vessels shipping cargo between two U.S. locations to be U.S.-built, majority U.S.-owned, and have at least 75 percent of the crew be U.S. citizens. Jones Act vessels are more expensive than non-Jones Act vessels, however, and are in short supply, making it difficult to move gasoline and other products to California from other U.S. ports. Obviously, this could lead to a gasoline shortage, and we're already seeing prices rise in Los Angeles, making it the most expensive form of gasoline of its type in the country. While commercial reasons alone may not be enough reason for a Jones Act waiver, a short-term waiver, similar to the temporary waivers that were provided during hurricanes Katrina, Rita, and Sandy, may be justified.

Analyzing all the impacts of oil prices is a monumental task, but I'm proud to say that MHFI, through its brands, has done a remarkable job of collecting and disseminating data and insights.

In fact, oil markets can be very opaque. We are committed to bringing more transparency to these markets, particularly through the work our Platts business does with our market on close price assessment process. The work of all of the MHFI brands brings more data and information to investors and market participants globally so they can understand commodity markets and make informed decisions.

I'm glad to provide more information on any of the issues discussed here today, or any others offered by MHFI, in the question and answer session or any time in the future.

Thank you.

ⁱ Tom Watters, "Standard & Poor's Publishes Revised Oil And Gas Price Assumptions," S&P Ratings Services, 1/9/2015

ⁱⁱ Watters

ⁱⁱⁱ <http://www.standardandpoors.com/ratings/definitions-and-faqs/en/us>

^{iv} Diane Vazza, "Taking Stock Of The Oil And Gas Sector After The Recent Downgrades," S&P Ratings Services, 2/19/2015

^v Beth Ann Bovino, "The Sharp Drop In Crude-Oil Prices Is A Net Plus For The U.S. Economy," S&P Ratings Services, 2/13/2015

^{vi} Gabriel Petek, "How Might The Oil Price Plunge Affect U.S. States' Credit Quality?" S&P Ratings Services, 1/27/2015

^{vii} U.S. Refiners May Seek Jones Act Waiver Amid Strike, Torrance Explosion," Platts, 2/26/2015

^{viii} Ibid

Before the Subcommittee on Energy and Power

Committee on Energy and Commerce

U.S. House of Representatives

Hearing on “21st Century Energy Markets: How the Changing Dynamics of World Energy Markets Impact our Economy and Energy Security”

Testimony of Amy Myers Jaffe

Executive Director, Energy and Sustainability

University of California, Davis

March 3, 2015

Chairman Whitfield, Ranking Member Rush, and distinguished Members of the Subcommittee: Thank you for the opportunity to appear before the Subcommittee today. The subject of this hearing is particularly timely in light of the changing circumstances in the international oil market and the new kinds of risks that are emerging from oil price volatility. The United States has been afforded a huge opportunity to improve both its position relative to economic exposure to world energy market volatility and its geopolitical influence in the past few years, but we are by no means out of the woods when it comes to energy security. I am honored to discuss with you today this important topic and specifically, to outline the geopolitical elements to today’s oil market situation and their implications for the United States.

The decision by the Organization of Petroleum Exporting Countries (OPEC) to reverse itself to favor market share over prices is a complex one. It is not at all clear to me, regardless of the media hype to that effect, that OPEC members are targeting U.S. unconventional oil and gas production. While it is true that rising U.S. oil production was what put OPEC under pressure in

the first place, the decision by key member states such as Saudi Arabia, Kuwait, the United Arab Emirates and Qatar, to allow oil markets to remain oversupplied is driven mainly by broader geopolitical concerns, many of which coincide with those of the United States. These include increasing the pressure on Iran and Russia to come to the bargaining table and settle existing conflicts (eg, Syria, Iraq and Iran's nuclear aspirations) through compromise and diplomacy. Saudi Arabia also has strong unique geopolitical and national security interests to maintain its position as a major supplier of oil and thereby an important ally to the United States. In 2014, U.S. crude imports from Saudi Arabia has lost about 440,000 b/d of market share, with exports to the U.S. dropping to 894,000 b/d starting last summer, their lowest level since 2009, according to US Energy Information Administration (EIA) data. Much of the Saudi oil was replaced by shipments from Canada whose exports to the U.S. jumped to 2.956 million b/d, up roughly 340,000 b/d from a year earlier 2013.

The combination of the stronger U.S. oil and gas sector, and an aggressive Saudi oil policy, appears to be having some of the desired effects. Iran's top leaders have in recent weeks implied that compromise could be elemental to P5+1 talks while Russia is facing increased financial pressure. Saudi Arabia and other Arab Gulf countries have amassed large floating oil stocks that serve as a deterrent to increased adventurism by either Tehran or Moscow, though it remains unclear if an end game with diffused conflicts will actually emerge. The United States has hampered its potentially enhanced international stature by keeping its own oil surplus sheathed. US tight oil could be a greater benefit to U.S. allies and free markets, were the Congress to lift the 40 year old export ban.

America's Global Leadership Role

The United States can do much more to use its advantageous energy position to enhance its global leadership role. Our current policies of limiting natural gas exports and banning crude oil exports must be considered in the context of the U.S. international leadership role and not just in the confines of U.S. domestic political priorities. In the global context, hoarding energy supplies inside our borders sends the message to other countries that they too should be hoarding their energy. Such attitudes were precisely what worsened the economic damage to the global economy during the 1979 oil crisis. The United States is bound by our membership in the International Energy Agency (IEA) emergency stockpile system to share our energy in times of emergency or major disruption, so it seems all the more ludicrous that our hoarding of supplies will be limited to periods where energy supply is sufficient.

It is not the case that hoarding energy supplies inside our borders helps lower prices to consumers. The United States is both an importer from and exporter of gasoline to the international market. As such, U.S. gasoline prices are generally speaking tied to global market trends. Analysis by the U.S. Department of Energy, among others, has shown that the export ban is not lowering gasoline prices here in the U.S.

The current consequence of the U.S. oil export ban is the accumulation of historically high, surplus crude oil inventories that is depressing U.S. crude oil prices relative to global markets. Stocks at oil trading hub Cushing, Oklahoma, are near their historical high of 52 million barrels, causing a substantial discount (over \$1.50) between the current price and prices for future months. Left untreated, the shortage of available tankage could mean the United States will sacrifice some of the projected future oil production increase of 500,000 b/d to 800,000 b/d expected to materialize over the rest of 2015 by the U.S. Energy Information Administration (EIA) and major financial institutions such as Citi. The crude oil containment problem could be

easily solved by allowing exports, a policy that could assist allies such as Mexico and Europe who are eager to have access to U.S. condensates and tight oil. Such energy trade strengthens our ties to important allies and trading partners and thereby enhances American power and influence.

The United States needs to lead from the front when it comes to energy geopolitics. Open trade and investment in energy is important to vital U.S. interests. Artificial restrictions on energy flows can be a source of international conflict as we can already see from events in Eastern Europe and the Middle East. Moreover, the United States has a direct interest in preventing energy from being used as a strategic weapon or as a spoil of war in civil conflict between competing militias or sectarian groups. A formalized national security assessment needs to be a more transparent metric for decision making on energy infrastructure and trade policy, similar to the manner in which environmental assessments are performed. Our international diplomacy should be addressing energy pro-actively. By leading the charge of new energy technologies and energy exports, the United States has the ability to fashion a global energy world that is more secure, freer of geopolitical strings and lower in carbon emissions. We should not shirk that responsibility to save a few pennies on the energy bill of some subset of the U.S. manufacturing sector which will be increasingly competitive given its geographic proximity to abundant, new U.S. energy resources and access to innovative technologies like the industrial internet.

Seeds of Future Instability

The global oil market still faces key sources of instability for supply. With low oil prices, Venezuela's economic problems have raised the risk of a severe political crisis. Lacking access to adequate finance, Venezuela's oil industry will have difficulty maintaining oil output levels in the face of steep natural decline rates at its fields. State oil firm PDVSA's lack of funds has

prompted a slowdown in progress for new Orinoco Belt heavy oil projects and upgrading units for existing production are said to be in disrepair. The country, which faces the possibility of a sovereign default on its massive debt, suffers from an inflation rate of 60% and the population is suffering from acute shortages of basic foodstuffs and medicines. Venezuela has debt repayment of about \$11 billion to \$12 billion annually and relies heavily on oil exports as its source of revenue. With Parliamentary elections technically due to take place later this year, the Maduro government has turned to violent repression to damp down civil unrest, recently arresting popular opposition leader Antonio Ledezma, mayor of Caracas, on a charge of conspiracy.

Russia has so far avoided a similar kind of crisis as the falling ruble reduced the costs of doing business in the Russian energy sector, but eventually Russian output could also face financial hurdles as major Russian companies like Rosneft and Novatek face collapsing profits and are unable to raise external capital. Falling energy price and plunging sales to Europe have also hit Russian gas giant Gazprom's revenue, potentially depriving Russia of \$6 billion in revenues to the Federal budget this year alone. Average Russian natural gas prices to Europe are expected to fall by a third this year and sales to some key European clients are down by half as the slow economy, energy efficiency efforts, diversification to alternative supplies and a mild winter have eaten into Gazprom's sales. Gazprom revenues usually contribute a fifth of Russia's federal budget. In the past, sales to Europe have accounted for more than half of Gazprom's revenues.

Iraqi and Libyan production is also under threat from the warfare raging in those countries where various parties are vying to control oil assets. Dangerously, the Islamic State (ISIS) temporarily gained control of Iraq North Oil Company's 35,000 b/d Khabbaz oil field near Kirkuk. The battle was significant because Kirkuk is an important Iraqi oil production region whose political status has been highly contested. The Kirkuk oil fields came under the control of the KRG military in

July 2014, and Iraqi central government forces are currently joining the fight there against ISIS, but the region's territorial status remains contested. The fields around Kirkuk are producing 400,000 to 500,000 b/d currently and could contribute to a large increase in the country's future oil production.

ISIS continued strategy to try to grab oil fields for its possible "statehood" underscores a grave danger for the region and a source of instability to global oil supply. If existing national borders and authorities are not considered permanent or authoritative, regional oil facilities will become both strategic assets and spoils of war in not only the greater battle for Syria and Iraq but potentially in the struggle for geopolitical power across the entire region. This turn of events is a serious challenge to stability across the Middle East and for the global oil market. My research with econometrician Mahmoud El-Gamal shows that oil facilities damaged during wartime can dramatically reduce access to oil from a country for years, if not decades.¹

The concern that oil will drive military actions across the Middle East cannot be overstated. IS, led by former military leaders from Saddam Hussein's brutal regime, clearly understand the importance of oil assets and revenues during wartime, given their history of the 8 year war with Iran and battle for Kuwait. ISIS "oil related" threat in the region has not been lost on other regional powers. Troops are already lining the Saudi northern border, and Iran has positioned troops to protect Iraq's southern oil fields at a time when Basrah's local leaders have been threatening to hold a referendum on whether to become a semi-autonomous region like the KRG.

Increasing Importance of US Energy Diplomacy

¹ El-Gamal, Mahmoud Amin and Amy Myers Jaffe (2013) Oil Demand, Supply and Medium Term Price Prospects: A Wavelets-Based Analysis. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-13-10

All this is to say that the United States should be pursuing its energy diplomacy more pro-actively. Militias in the Middle East and Africa have learned that they can undermine the authority of existing political leadership in the region by overtaking oil facilities. A prime example of this is Libya where what might have been a successful transitioning government fell into disarray as rebel factions grabbed or turned off key oil installations or denied access to export ports and terminals.

The United States should be following up military action with intensive diplomacy geared to help emerging political leaders to better negotiate about equitable systems and institutions for the distribution of oil wealth in the region. The United States should be elevating oil and gas revenue sharing conflict diplomacy to the highest levels. If the U.S. is going to be successful engaging diplomatically in the Middle East, it needs to take a leadership role in the difficult task of helping leaders forge lasting domestic political pacts on how to share oil revenue equitably and to minimize official corruption in countries that are or could be torn by civil war or sectarian violence. That NATO and the United States have not clearly taken this challenge seriously enough is demonstrated in Libya where what started as a promising beginning for a newly elected Libyan government has ended in violent civil conflict driven in part by lack of agreement over regional oil revenue sharing. The failure to implement effectively such oil conflict diplomacy has crippled U.S. efforts to stabilize countries such as Iraq and Libya.

US Energy Policy: Build on Success

The United States has substantially lowered its oil imports but we are still attached to the global oil market and subject to the risks facing it. Overall, the U.S. economy still benefits from lower oil prices, analysis from the U.S. Federal Reserve Bank shows. It would take a four-fold increase

argue, demonstrating the importance of well-designed transportation policies. There is no question that technological innovation and new investment strategies by U.S. independent oil companies are bringing about a renaissance in U.S. domestic oil and gas production, creating a prolific U.S. energy supply outlook. But without government intervention to curb our appetite for oil, this rising production might have done little more than meet increases in incremental demand— putting us back in the deep dependency of prior decades and with OPEC and Russia in the driver's seat.

It is important to note that the dramatic rise in U.S. energy production comes in the form of both oil and gas and renewable energy. In effect, the country has hit the jackpot on both fossil fuels and clean technology simultaneously, leaving us in an enviable position where cheap and ample energy supply is driving economic growth and wealth creation. The U.S. has added more than 500,000 jobs in the oil, gas and clean tech sectors in the past five years, contributing to a boom often likened to a second industrial revolution. Renewable energy production in the United States has been steadily on the rise, with over 17,000 megawatts (MW) of solar, wind and geothermal capacity currently under construction. The U.S. Energy Information Administration estimates that that renewable energy will represent one-third of all new electricity generation added to the national grid over the next three years. Installed U.S. solar energy capacity increased 418 percent between 2010 and 2014 to 12,057 MW.

Policy makers might also want to consider ways to lock in the benefits of a healthy U.S. clean tech and domestic natural gas sector from the negative fallout from the OPEC price war.

One way to help U.S. natural gas producers beat OPEC would be to nurture natural gas as a fuel for the U.S. heavy-duty trucking fleet. While launching a national network for liquefied natural gas (LNG) fueled trucks might be difficult and expensive, an initial small-scale natural gas transportation network for heavy trucking could be launched in key U.S. regions situated near high-volume travel corridors, according to a new study published by the Institute of Transportation Studies at the University of California Davis and Rice University. The study highlights how California, the Great Lakes and the mid-Atlantic are well positioned to serve as pilot networks due to their proximity to trucking corridors. The U.S. Department of Energy tried a corridor approach to biofuels use in the 1990s, but natural gas is likely to have more compelling economics. Such a network could enable a faster transition to renewable natural gas, biogas and waste-to-energy pathways — though it would require significant policy intervention to reap climate change benefits. Utilizing natural gas for heavy trucking would also improve energy security and weather-related resiliency by diversifying the geographic fuel supply, while potentially improving U.S. economic competitiveness by lowering costs along national freight supply chains. But stricter efficiency standards for LNG-fueled heavy-duty trucks and stronger regulations of methane leakage along the natural gas supply chain are needed for natural gas to advance low-carbon-fuel goals. To date, the long-haul trucking industry has favored less-expensive spark ignition (SI) engine technology that has lower levels of climate performance.

Moving forward on clean tech, California holds lessons for the wider U.S., including concerns that carbon regulation will create economic inefficiencies and kill economic growth. California's economy has been growing by about 4 percent a year and will soon be the 7th largest economy in the world, overtaking Brazil. Its policies serve as a starting point for demonstrating viable, market responsive climate policy approaches, by stimulating innovations and investments in low-

carbon technologies and behaviors. California policy, for example, has stimulated investments in and sales of plug-in electric vehicles (PEV) and is driving other energy innovations such as smart grid technology, big data logistics efficiency software and distributed generation technologies. To date, over a third of U.S. PEV sales are in California, even though the state accounts for only 12 percent of the population.

PIONEER

NATURAL RESOURCES

Before the Subcommittee on Energy and Power

Committee on Energy and Commerce

U.S. House of Representatives

Hearing on “21st Century Energy Markets: How the Changing Dynamics of World Energy Markets Impact our Economy and Energy Security”

Testimony of Scott D. Sheffield

Chairman and Chief Executive Officer

Pioneer Natural Resources Company

March 3, 2015

Chairman Whitfield, Ranking Member Rush, and distinguished Members of the Subcommittee:

Thank you for the opportunity to appear before the Subcommittee today. The subject of this hearing is particularly timely and of utmost importance to assessing the impact of current developments in the oil and gas industry on the health of the U.S. economy and U.S. energy security.

I offer you my perspective today as a petroleum engineer with more than 40 years of experience, including over 30 years as Chief Executive Officer of Pioneer Natural Resources Company and its predecessor company.

Pioneer is a leading independent exploration and production (E&P) company headquartered in Dallas, Texas. Our company is the third most active operator in the United States, based on

footage drilled. We employ approximately 4,000 very hardworking and talented people. I am pleased to say that number is up from about 1,400 in 2005, when Pioneer reinvented itself from a global exploration company to a shale producer with its sole focus on onshore U.S. opportunities. I am especially proud that Pioneer has been responsible for investing over \$20 billion directly in the United States since the beginning of 2005. A large portion of this investment was funded by the sale of *all of our international assets* over the same period. We have more than doubled our U.S. workforce in the past five years, while being recognized repeatedly as a top place to work. We also have created thousands more high-paying jobs through our contractors, suppliers, construction workers, truck drivers and others who are actively involved in the supply chain.

Key Points

I will provide more detailed observations below. First, here are the key points that I wish to leave you with today:

- **The shale oil and gas revolution has revitalized domestic energy production, substantially boosted the Nation's employment and overall economy, and strengthened U.S. energy security. Growing U.S. production has increased global competition and reduced energy prices and, therefore, gasoline prices as well. These advances are now at risk because of the out-of-date ban on exporting crude oil produced in our country.**
- **Surging U.S. production and weak global demand have driven the E&P industry into a downturn. Price cycles come with the territory and we will navigate this downturn as we have in the past. Producers of domestic oil are especially**

disadvantaged compared to foreign producers, however, because they cannot receive global prices.

- **Historically, U.S. oil prices have been in line with international prices. In recent years, however, U.S. oil has sold at substantially lower prices than international levels, in part because of the export ban.**
- **Prices for U.S. crude oil continue to weaken, compared to international prices. A massive buildup of oil is occurring in the United States, surpassing the volumes that domestic refiners are interested in buying. Storage of domestic crude oil is at an 80-year seasonal high — over 434 million barrels — and storage capacity is running out. This is symptomatic of the combination of the export ban and the limited appetite for light tight oil among the only customers we can access. Absent the ban, U.S. producers could be selling their crude oil abroad and driving global crude prices lower by increasing global supply.**
- **Shale oil production requires significant reinvestment of capital to sustain growth. Therefore, in order to effectively compete and reinvest capital in domestic resources, U.S. shale oil producers must not be disadvantaged vis-à-vis their competitors that sell into the broader world market. This means that U.S. producers of crude oil must have access to the export markets, just like U.S. refiners that produce gasoline or farmers who produce grains.**
 - **If current trends continue and the export ban is not lifted, U.S. shale oil production will flatten or decline by disproportionate volumes versus our**

overseas competitors, diminishing the profound benefits of the shale revolution.

- **The strategy of OPEC countries is clear: to downsize U.S. production, reduce global supply and increase OPEC's market share, which will ultimately lead to higher international prices. Regrettably, the ban on U.S. exports unwittingly enables the OPEC strategy. If U.S. producers are forced to downsize further due to a protracted downturn exacerbated by the export ban, it could take the industry many years to restore growth. Loss of critical mass in the U.S. oil and gas sector equates to a loss of energy security for the United States.**
- **Every recent economic study, including a study by the U.S. Energy Information Administration (EIA), has demonstrated that U.S. gasoline prices are primarily linked to international crude oil prices, not domestic crude oil prices. Allowing U.S. crude oil to be sold overseas would increase global supply, which is why the clear and growing consensus of knowledgeable analysts is that lifting the export ban would *cause gasoline prices to decline*. The export ban, therefore, denies U.S. consumers the full economic benefit of the U.S. energy revolution. Removing crude oil export constraints would also help keep a lid on rising global prices when demand recovers, by letting U.S. producers meet the rising demand.**
- **The crude oil export ban was adopted 40 years ago to address circumstances that long ago disappeared — most notably, U.S. domestic price controls, which were removed in 1981. Today, the ban acts only to bar U.S. companies from competing on equal footing in the very global market that sets the prices driving their business.**

- **This out-of-date policy hurts U.S. consumers, harms job creation and perversely undercuts U.S. energy security and critical foreign policy goals.**
- **The export ban will discourage investment in U.S. oil production, especially in this highly competitive environment. A market-based policy would encourage continued development of resources in the United States, rather than abroad.**

In virtually every other aspect of American commerce, the U.S. government rightly acts aggressively to remove foreign barriers to international market access by U.S. exporters. Here, the market is the global market, and the barrier is the self-imposed ban that prohibits U.S. oil producers from competing in it. In contrast, all other energy commodities are exportable — gasoline, petrochemicals and other products refined from oil, coal, LNG and natural gas. The government should treat crude oil similarly, allowing its sale to trading partner customers abroad. An unwillingness to level the playing field for U.S. producers will contribute to a deeper and longer industry retrenchment, eventually leading to declining U.S. production, a loss of jobs and tax revenues, and a return to increased reliance on foreign sources of crude oil.

The Shale Revolution

As recently as 2005, the United States depended on imports of foreign energy sources for more than half of our oil and natural gas needs, and experts generally predicted that our dependence would only rise in the future. A decade later, the U.S. energy landscape has been transformed by the shale oil and natural gas revolution within our borders. This U.S. energy renaissance is appropriately called the “Age of Energy Abundance”.

Several developments have made this possible: (1) the realization that the source rock for the oil and natural gas in conventional reservoirs could itself be developed; (2) the game-changing advancements in science, technology, and engineering — in particular, horizontal drilling and hydraulic fracturing using state of the art three and four dimensional seismic mapping and drilling rigs that can bore more than 10,000 feet with pinpoint accuracy; (3) access to hydrocarbon resources under private ownership, with a stable and predictable legal environment; (4) a robust energy service sector and significant investment in midstream oil and gas transportation and infrastructure; and (5) strong commodity prices. Independent, entrepreneurial companies — many of which are small businesses — have lead the way, drilling the vast majority of shale wells.

The result? Global and domestic energy markets have been transformed, hundreds of thousands of high-paying jobs have been created in the United States, and billions of dollars have been reinvested here that would otherwise have been invested abroad. Indeed, the redirection of investment by Pioneer and other companies from foreign E&P operations to the United States, and the attraction of billions of new foreign investment into the U.S. oil and gas industry, may be the greatest “in-sourcing” story of recent decades.¹

¹ The U.S. Department of Commerce estimates that the foreign direct investment position in the petroleum refining and extraction sector grew at a compounded annual growth rate of nearly 60% from 2008 - 2012, far outdistancing the growth rates in nearly every other sector. Foreign Direct Investment in the United States: Drivers of U.S. Economic Competitiveness, December 31, 2013. These data, of course, do not include the vast redeployment of capital into U.S. E&P activities by Pioneer and many other companies.

The re-emergence of the United States as a major oil producer is remarkable:

- The United States has now surpassed Saudi Arabia and Russia as the world's largest producer of petroleum and natural gas hydrocarbons. In each of 2013 and 2014, U.S. oil output jumped by 1 million barrels per day,² providing most of the world's oil production growth.
- Globally, the supply of oil has become far less concentrated, with OPEC's share of production declining from 53% in 1973 to about 35% today as U.S. production surged.
- United States reliance on foreign energy has dropped sharply, thanks mainly to the shale oil and gas boom: Total U.S. net imports of energy declined 19% from 2012 to 2013, hitting the lowest level in more than 20 years.³
- The U.S. annual average level of crude oil production fell from 9.6 million barrels per day in 1970 to 5 million barrels per day in 2008. Since then, driven principally by shale development, production has rebounded to over 9 million barrels per day. Production in January 2015 of 9.2 million barrels per day is 80 percent higher than 2008 production, and U.S. crude oil production could more than double by the mid-2030s.⁴
- As recently noted by the U.S. Department of Commerce, the U.S. petroleum deficit – the percentage of the total trade deficit attributed to petroleum products – is at its lowest point in 10 years.⁵ 2014 was also a record year for petroleum product exports, accounting for nearly 10 percent (\$146 billion) of total U.S. exports.

² U.S. Field Production of Crude Oil, Energy Information Administration, <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MCRFPUS2&f=M> (last visited February 27, 2015).

³ Net energy imports in 2013 lowest in more than 20 years, Energy Information Administration, April 2, 2014, <http://www.eia.gov/todayinenergy/detail.cfm?id=15671> (last visited February 27, 2015).

⁴ US Crude Oil Export Decision: Assessing the Impact of the Export Ban and Free Trade on the US Economy, IHS Energy, May 29, 2014.

⁵ Annual Trade Highlights, 2014 Press Highlights, United States Census Bureau, <http://www.census.gov/foreign-trade/statistics/highlights/annual.html> (last visited February 27, 2015).

- The availability of low-cost natural gas has reduced greenhouse emissions by allowing cleaner fuels to have a greater share of our power generation mix.

These are all remarkable accomplishments, especially considering that not long ago our country faced a significant and rising dependence on foreign sources of oil.

Today, major U.S. oil producing areas that were declining or not yet discovered at the beginning of the 21st century — the Permian Basin and the Eagle Ford Shale and Bakken Plays — stand as some of the largest and most prolific oil basins in the world.⁶ The unconventional type of oil largely produced in these areas is called “Light Tight Oil” (LTO). LTO has a higher API gravity (40° and above) than oil typically extracted from conventional or deep-water sources. It is “tight” because it is extracted from dense rock formations.

A substantial amount of associated natural gas is produced from shale oil wells. According to the EIA, more than 60% of new U.S. wells produce both oil and gas,⁷ contributing a third of the growth of new U.S. natural gas supplies.⁸ This contribution to the surge in affordable domestic natural gas supplies is enabling a U.S. manufacturing renaissance.

The domestic oil and gas industry has been a major growth engine of the U.S. economy, one of the few bright spots during the recent long recession, providing American consumers with a wide

⁶ See Appendix A.

⁷ Outlook for North American Natural Gas, EIA, http://www.eia.gov/pressroom/presentations/sieminski_11112014.pdf (November 11, 2014).

⁸ Scott Disavino and Barani Krishnan, Low oil prices threaten to curb ‘associated’ gas output growth, Reuters, November 4, 2014, available at <http://www.reuters.com/article/2014/11/05/us-energy-natgas-shale-idUSKBN0IP03D20141105>.

array of benefits – from higher wages to lower heating bills and gasoline prices. In recent years, state and local governments have enjoyed significantly increased revenues to support public services through enhanced local employment, a broader tax base and higher royalty payments associated with the increased production of the oil industry.

The industry has created hundreds of thousands of good-paying jobs, directly and indirectly among the countless suppliers of equipment, goods and services used by U.S. oil and gas producers, including construction contractors, construction equipment manufacturers and dealers, logistics companies, well services providers, professionals such as engineering and architectural firms, and providers of materials and supplies such as sand, cement, trucks and steel pipe.⁹ Shale energy activities support over half a million supply chain jobs,¹⁰ and have been one of the most important drivers of the U.S. manufacturing sector's robust performance over the last five years.¹¹

Current Conditions

Over the past eight months, we have experienced a dramatic drop in U.S. and global oil prices. Until last June, despite the significant increase in U.S. shale oil production, North American oil prices had been fairly stable for many years, which encouraged significant capital investment.

⁹ See, e.g., Bureau of Labor Statistics, U.S. Department of Labor, The Economics Daily, Employment changes in the oil and natural gas industry, by state on the Internet at http://www.bls.gov/opub/ted/2014/ted_20140404.htm (last visited February 27, 2015); The Shale Gas and Tight Oil Boom: U.S. States' Economic Gains and Vulnerabilities, Council on Foreign Relations, October 2013, <http://www.cfr.org/united-states/shale-gas-tight-oil-boom-us-states-economic-gains-vulnerabilities/p31568> (last visited February 27, 2015); Oil and gas industry employment growing much faster than total private sector employment, Energy Information Administration, August 8, 2013, <http://www.eia.gov/todayinenergy/detail.cfm?id=12451> (last visited February 27, 2015).

¹⁰ Supplying the Unconventional Revolution: Sizing the unconventional oil and gas supply chain, IHS Economics, September 2014, p.1.

¹¹ Thomas J. Duesterberg et al., Lifting The Crude Oil Export Ban: The Impact on U.S. Manufacturing, Aspen Institute (October 2014), p.2.

Generally speaking, the growth in U.S. oil production reduced oil imports, while offsetting supply disruptions globally, particularly from Libya and Iran. Indeed, experts have noted that the U.S.-led nuclear sanctions targeting Iran would not have succeeded but for the vastly increased U.S. production.¹² Surging U.S. oil production helped prevent oil prices from rising sharply, and likely averted another global recession.

During the second half of 2014, however, as United States production continued to surge, worldwide demand was sluggish, reflecting the decline in China's growth rate, the lingering recession in Europe, and weaker economic performance in other regions. The combination of these factors resulted in worldwide oversupply of crude oil and oil price weakness. These conditions intensified late in the year, when the market reacted negatively to OPEC's decision to maintain production quotas at current levels to preserve market share.

Other than U.S. production, crude oil is traded in a global market, where the key global benchmark price is based on the price of Brent, a crude oil blend drawn from a dozen or so fields in the North Sea. West Texas Intermediate (WTI) is the primary benchmark price for crude oil sold in the United States. For more than two decades prior to 2011, Brent and WTI prices moved in tandem, with WTI consistently priced higher, reflecting the transportation cost differential. This difference between Brent and WTI prices at any particular point in time is called "the spread."

¹² See Remarks by Thomas E. Donilon, Center on Global Energy Policy, School of International and Public Affairs, Columbia University, January 21, 2015.

Since 2011, however, the spread has heavily favored Brent pricing. For example, in 2013, the impact of supply from Canada into the United States and transportation bottlenecks caused the Brent/WTI spread to blow out to as high as \$23 per barrel in the country's key oil transportation hub in Cushing, Oklahoma.¹³ Pipeline expansion provided some relief to these bottlenecks, which temporarily reduced the spread between Brent and WTI. However, due to the constraint imposed by the export ban, the spread has recently begun to widen again to an ominous gap, especially at current price levels. The growing spread is a clear signal that U.S. LTO production is not being absorbed effectively in the U.S. market.

Prices declined significantly for both Brent and WTI in 2014. From its high of \$115 per barrel in June 2014, the price of Brent fell to \$45 per barrel on January 13, 2015. But where Brent has recovered to over \$60 per barrel, the U.S.-based WTI index has remained under pressure below \$50 per barrel. Experts believe the spread will widen dramatically in the future as the crude oil export ban leads to a glut of trapped LTO. Again, U.S. consumers will not benefit from that glut by seeing lower gasoline prices—those prices are based on Brent oil prices. Instead, cash flow constrained producers will be forced to reduce drilling activity even more, which will reduce domestic production and leave consumers and the country worse off.

At Pioneer, we have made tough decisions to respond to the downturn. We have reduced capital spending, operating costs, and general and administrative expenses. We have reduced our rig activity to 16 horizontal rigs drilling, from a high of over 30 in 2014. Rigs have been stacked in our operating areas. We expect to reduce our capital spending in 2015 by over 45% to about \$1.85 billion, down from \$3.6 billion in 2014.

¹³ See Appendix B.

Other companies are replicating our actions; based on the publicly available information illustrated on Appendix C, U.S. public E&P companies intend to reduce their capital expenditures by 35% in 2015 over 2014, a spending decrease of \$50 billion. The result will be dramatically lower spending in the oil and gas sector, which translates directly into lower employment, wages, and taxes related to our industry, including suppliers, throughout the country.¹⁴

As discussed above, a substantial amount of natural gas is produced from shale oil wells. As drilling slows and existing wells decline steeply, natural gas growth from shale oil production will slow, undercutting the benefits of low cost fuel for the nascent U.S. manufacturing renaissance and other industries dependent on affordable, plentiful natural gas.

Impacts Specific to U.S. Shale Producers

The need to respond to price cycles effectively and promptly is always in the minds of operators in the oil and gas industry. We are adjusting to the current environment in pragmatic ways. It is nonetheless important to understand certain particular aspects of U.S. shale oil production in order to appreciate fully the potentially serious adverse impact of the current downturn on the broader U.S. economy, and the one step that the government should take to help moderate that impact.

¹⁴ For example, U.S. Steel Corporation recently announced the layoff of nearly 2,000 workers in its tubular operations in Texas and Alabama. U.S. Steel Corporation, press release, January 26, 2015, <https://www.ussteel.com/uss/portal/home/newsroom/pressreleases> (last visited February 27, 2015).

(a) The Need for Sustained Investment

Shale development is capital intensive and requires a continuous reinvestment of cash flow and borrowing to maintain and increase production. In fact, most shale producers, like Pioneer, will reinvest all their cash flow from sales of oil and gas into capital for new wells. As reflected in the decisions that Pioneer has made, this reality of shale development and production compels operators, facing the prospect of sustained low prices, quickly to reduce their capital spending on development activities. The falling revenues from the combination of declining production and lower prices rapidly constrict an operator's ability to fund new drilling activities.

Not surprisingly, the current domestic rig count is down by 39 percent, or 842 rigs idled, from its peak in October 2014,¹⁵ and is continuing to decline. In January 2015 alone, over 20,000 job cuts were attributed to the decline in oil prices and the number of job losses, both within our industry and in the many industries that depend on the E&P sector, will dramatically rise if current market conditions persist.¹⁶

¹⁵ RigData.

¹⁶ *E.g., see 2015 January Job Cut Report: 40% of 53,041 Cuts Due to Falling Oil Prices*, <http://www.challengergray.com/press/press-releases/2015-january-job-cut-report-40-53041-cuts-due-falling-oil-prices>, (last visited February 27, 2015).

(b) The Impacts of the Crude Oil Export Ban

The magnitude of the price drop since mid-2014 has led directly to decisions to reduce drilling activity and eliminate jobs, as we are seeing throughout the industry today. Those actions are a natural consequence of market conditions. But another, non-market factor is exacerbating the impact of the price decline: The 1970s-era crude oil export ban, which artificially constricts the potential range of customers for U.S. production and ensures that U.S. producers receive a government-suppressed price in the domestic market. This artificial market distortion is evidenced by the relationship between U.S. gasoline prices and international and domestic crude oil prices, represented by Brent and WTI, respectively. As the EIA has shown, Brent crude oil prices are more important than WTI crude oil prices as a determinant of U.S. gasoline prices in all parts of the country, including the Midwest. What that means is that consumers do not see any benefit from these government-suppressed domestic crude prices when they pay for gasoline. The only impact is to place U.S. producers at a competitive disadvantage with their foreign counterparts.

I expect that there will be sustained downward pressure on U.S. WTI oil prices. Several factors contribute to my assessment:

- Despite large curtailments in new drilling, production growth will continue during the first half of 2015 because wells already under development will be completed and placed on production, continuing the oversupply trapped in the United States.
- Shale oil producers can slow activity rapidly in the face of adverse market developments, which will eventually result in lower production. In contrast, Canadian oil sands

production will continue to come online and to find its way to the United States, where U.S. Gulf Coast refineries have revamped to accommodate the heavy Canadian crude. In addition, recent pipeline and rail expansions will facilitate movements of Canadian crude to the Cushing, Oklahoma hub, where it competes with U.S. production, including for storage.

- According to EIA, U.S. commercial crude oil stocks increased 8.8 million barrels, to a total of 434 million barrels, in the week ending February 20,¹⁷ with U.S. refiners operating at 87.4% of utilization capacity.¹⁸ In short, storage capacity is being filled to the brim — reaching an 80-year seasonal high.¹⁹

As long as the spread between Brent and WTI prices remains at high levels, U.S. shale producers will be capital constrained from resuming drilling activities at former levels. The graph at Appendix E to my testimony shows the potential consequences to production at various price points. As shown on the table, the respected analytical firm PIRA projects that shale oil production may tail off rapidly and significantly in coming years, with every \$10 per barrel difference in price resulting in the loss of two million barrels per day of production after six years. With the spread between Brent and WTI now more than \$10 per barrel and projected to rise, removing the export ban could make the difference between growing or shrinking production in U.S. For example, if U.S. producers received Brent prices today, this would increase production in the U.S. by as much as two million barrels per day.

¹⁷ Weekly U.S. Ending Stocks excluding SPR of Crude Oil, Energy Information Administration, <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=WCESTUS1&f=W> (last visited February 27, 2015).

¹⁸ See [Weekly Inputs & Utilization](http://www.eia.gov/dnav/pet/pet_pnp_wiup_dcu_nus_w.htm), Energy Information Administration, February 13, 2015, http://www.eia.gov/dnav/pet/pet_pnp_wiup_dcu_nus_w.htm (last visited February 27, 2015).

¹⁹ Market Prices and Uncertainty Report, Energy Information Administration, February 2015, <http://www.eia.gov/forecasts/steo/uncertainty/> (last visited February 27, 2015). See Appendix D.

Disparity between Crude Oil and other Hydrocarbons and Refined Products

Among hydrocarbon resources, only crude oil remains effectively banned from export. Indeed, crude oil is one of only three commodities restricted for export under regulations that limit exports of products in “short supply”; the other two are unprocessed western red cedar, and horses shipped by sea for slaughter.²⁰

While current law restricts access by domestic oil producers to global markets, U.S. oil refiners and petrochemical manufacturers are free to sell refined petroleum products, including gasoline, diesel fuel and petrochemicals, on a global market. With the benefit of a surplus of low-cost U.S. feedstock and cheap energy from abundant natural gas, U.S. refiners and petrochemical companies have increased product exports into world markets, where they are highly competitive.²¹

As U.S. shale oil production has increased, U.S. refiners have enjoyed a growing abundance of supply, especially with traditional imports augmented by increasing Canadian supplies. Canadian producers are free to export oil to the United States, and can readily obtain a U.S. license to re-export the oil to other countries. Yet, the U.S. government denies U.S. producers — which use exactly the same U.S. transportation network and compete with Canadian crude for sales to U.S. refiners — the same market freedom.

²⁰ 15 CFR Part 754; §§754.4, 754.5.

²¹ Don't Stop The Party - Why Gulf Coast Refiners Keep on Dancing After Crude Price Collapse, RBN Energy LLC, February 22, 2015, <https://rbnenergy.com/don-t-stop-the-party-why-gulf-coast-refiners-keep-on-dancing-after-crude-price-collapse> (last visited February 27, 2015); “Sign, Sign, Everywhere a Sign” - Hints of Domestic Demand Growth Bring Back Good Memories for U.S. Refiners, Turner, Mason & Company, February 24, 2015, <http://www.turnermason.com/blog/2015/02/24/sign-sign-everywhere-a-sign/> (last visited February 27, 2015).

The Benefits of Removing the Crude Oil Export Ban

As Secretary of Energy Moniz recently noted, the EIA has found that the domestic price of gasoline is determined more by the price of Brent, not WTI.²² It follows that if U.S. crude oil could be marketed globally, the additional supply would tend to reduce the global price, and hence the price of petroleum products both in the United States and abroad. Every economic analysis over the past year of which I am aware has reached the same conclusion.²³

Over the past five years, the U.S. shale revolution was the primary source for global oil supply growth, which allowed the U.S. to reduce oil imports, while offsetting production disruptions globally. Had U.S. production not increased during this period, the world price of oil would have been much higher.²⁴ However, as a result of the substantial decrease in 2015 budgeted capital expenditures by cash-strapped U.S. producers and the steep decline of shale oil wells, U.S. shale oil production will likely begin to flatten or decline later in 2015 and if conditions persist, continue to decline for the foreseeable future. The impact of this decline will be magnified by the probable impacts of announced cancellation, curtailment or postponement of major price-sensitive development projects around the world and the ever-increasing risk of supply

²² Testimony of Hon. Ernest Moniz, Secretary of the U.S. Department of Energy, before the Senate Committee on Energy and Natural Resources, February 12, 2014, <http://www.energy.senate.gov/public/index.cfm/hearings-and-business-meetings?ID=5568eb52-fea5-409a-b037-c8e85cc657ec> (last visited February 27, 2015).

²³ See, e.g., Crude Behavior: How Lifting the Export Ban Reduces Gasoline Prices in the United States, Resources for the Future, February 2014; The Impacts of U.S. Crude Oil Exports on Domestic Crude Production, GDP, Employment, Trade, and Consumer Costs, ICF International, March 31, 2014; US Crude Oil Export Decision: Assessing the Impact of the Export Ban and Free Trade on the US Economy, IHS Energy, May 29, 2014; Changing Markets: Economic Opportunities from Lifting the U.S. Ban on Crude Oil Exports, Brookings Institution, September 2014; Changing Crude Oil Markets: Allowing Exports Could Reduce Consumer Fuel Prices, and the Size of the Strategic Reserves Should be Reexamined, United States Government Accountability Office, September 2014; The Economic and Budgetary Effects of Producing Oil and Natural Gas From Shale, Congressional Budget Office, December 2014.

²⁴ Thomas J. Duesterberg et al., Lifting The Crude Oil Export Ban: The Impact on U.S. Manufacturing, Aspen Institute (October 2014), p. 5.

disruptions in the Middle East and other producing areas. As a result, based on forecasted demand growth, excess global production capacity could be exhausted in as little as two years, resulting in sharply higher prices. OPEC countries clearly have determined that U.S. shale will now be the new “swing” production that must be the first to cut back in order for the world to maintain supply-demand balance. The strategy of OPEC countries is clear: to downsize U.S. production, reduce global supply and increase OPEC’s market share, which will ultimately lead to higher prices. If U.S. producers are forced to downsize further due to a protracted downturn caused by the export ban, it could take the industry many years to restore production growth. Loss of critical mass in the U.S. oil and gas sector equates to loss of energy security for the United States.

Pioneer’s experience with its export of processed condensate offers a small scale example of the benefits of lifting the export ban. Last year, Pioneer determined that under existing law and regulations, condensate processed through a distillation unit at its South Texas Eagle Ford Shale facilities is classified under the export regulations as a petroleum product, not crude oil. At Pioneer’s request and following factual inquiry and analysis, the Commerce Department’s Bureau of Industry and Security confirmed this interpretation through a standard “commodity classification” process. Since the second half of 2014, Pioneer has been exporting processed condensate to Asia and Europe at significantly improved pricing compared to condensate sales in the United States, where demand is limited. As a result, we recognize improvements to the anticipated cash flows from drilling Eagle Ford Shale wells, which translates into more activity, more spending and more jobs. These sales certainly have not diminished the vast amount of crude oil available to U.S. refiners at low prices.

As the facts in this testimony show, government policy in the form of the crude oil export ban has direct and adverse consequences for U.S. oil production, and, therefore, is a real threat to the new energy abundance that has blessed the United States during the past five years. I firmly believe that it is profoundly in the economic and national security interests of the United States to remove the ban.

I am not alone in my judgment. Virtually every economist, industry analyst, national security and foreign policy expert, and editorial board that has opined on the subject during the past 18 months has reached this same conclusion.²⁵ The full range of policy arguments for removing the ban are beyond the scope of my remarks today, but taken alone and together, they are compelling.²⁶ I particularly concur with the numerous foreign policy and national security experts who have called for the ban to be lifted as a way for the United States to enhance our national security by providing a stable, alternative source of supply for our friends and allies. It simply is indefensible to demand that these countries reduce or eliminate their crude oil purchases from Iran, for example, while refusing to sell them U.S. oil.

²⁵ *E.g.*, Dr. Lawrence Summers, Keynote Address at the Brookings Institution’s “Changing Markets: Economic Opportunities from Lifting the Ban on Crude Oil Exports,” (September 9, 2014); Remarks by Thomas E. Donilon, Center on Global Energy Policy, School of International and Public Affairs, Columbia University, January 21, 2015; Michele Flournoy and Richard Fontaine, The Steps A Divided Government Can Take to Protect National Interests, Washington Post, January 16, 2015; Oil Export Myths: Lifting the Ban will Increase U.S. Supply and Energy Security, Wall Street Journal, January 16, 2015.

²⁶ *See, e.g.*, The Impacts of U.S. Crude Oil Exports on Domestic Crude Production, GDP, Employment, Trade, and Consumer Costs, ICF International, March 31, 2014; US Crude Oil Export Decision: Assessing the Impact of the Export Ban and Free Trade on the US Economy, IHS Energy, May 29, 2014; Changing Markets: Economic Opportunities from Lifting the U.S. Ban on Crude Oil Exports, Brookings Institution, September 2014; Navigating The U.S. Oil Export Debate, Columbia University Center on Global Energy Policy, January 2015; Time to Lift the Ban on Crude Oil Exports, The Heritage Foundation, May 15, 2014; The Case for Allowing Crude Oil Exports, Policy Innovation Memorandum No. 34, Council on Foreign Relations, July 2013.

Let me summarize, from my perspective, the clear benefits of removing the ban on exports of U.S.-produced crude oil. This action would result in:

- Lower gasoline prices throughout the United States
- More high-paying American jobs
- Lower world oil prices
- Increased world oil supplies
- Decreased volatility of world oil prices
- Enhancing our national security and strengthening our allies
- Lower net crude oil imports into the United States
- Greater investment in crude oil production in the United States rather than abroad

I know of no real dispute about these potential benefits, nor of any credible argument that the U.S. economy or energy security require that the ban stay in place.

Conclusion

America's independent oil and gas producers are second to none in their innovation and efficiency. On equal terms of engagement, we can compete successfully with all foreign producers. But the terms are not equal: Government policy is effectively tying one hand behind our backs.

Across the political and policy spectrum, there is near consensus among those who have looked at the issue: U.S. restrictions on the export of crude oil are a self-defeating anachronism that harms consumers, the economy, and vital U.S. national security interests. There is no defensible

reason to maintain the ban. As former Secretary of the Treasury, and Chair of the National Economic Council, Dr. Lawrence Summers stated:

“I believe that the question of whether the United States should have a substantially more permissive policy with respect to the export of crude oil and with respect to the export of natural gas is easy. The answer is affirmative. The merits are as clear as the merits with respect to any significant public policy issue that I have ever encountered.”²⁷

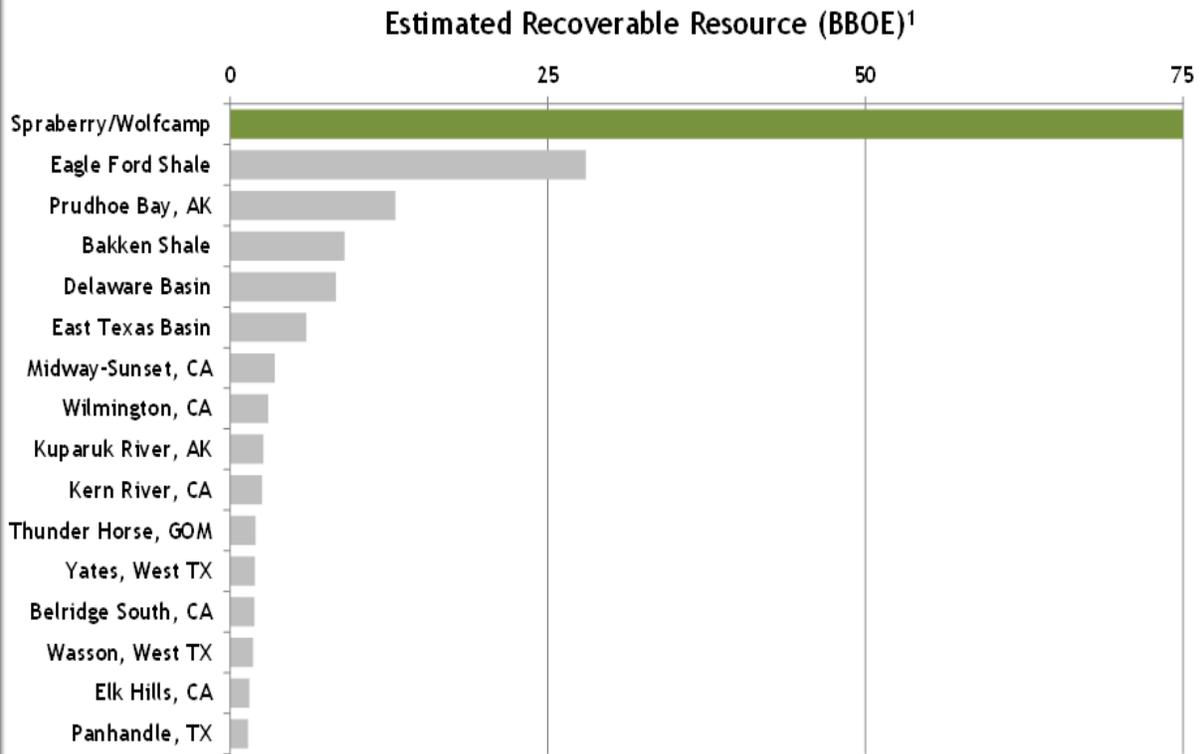
Removing the ban is an action on which members of both political parties can and should readily agree. I urge the members of this Committee to take the lead in forging that path.

²⁷ Dr. Lawrence Summers, Keynote Address at the Brookings Institution’s “Changing Markets: Economic Opportunities from Lifting the Ban on Crude Oil Exports,” (September 9, 2014).

Appendix A

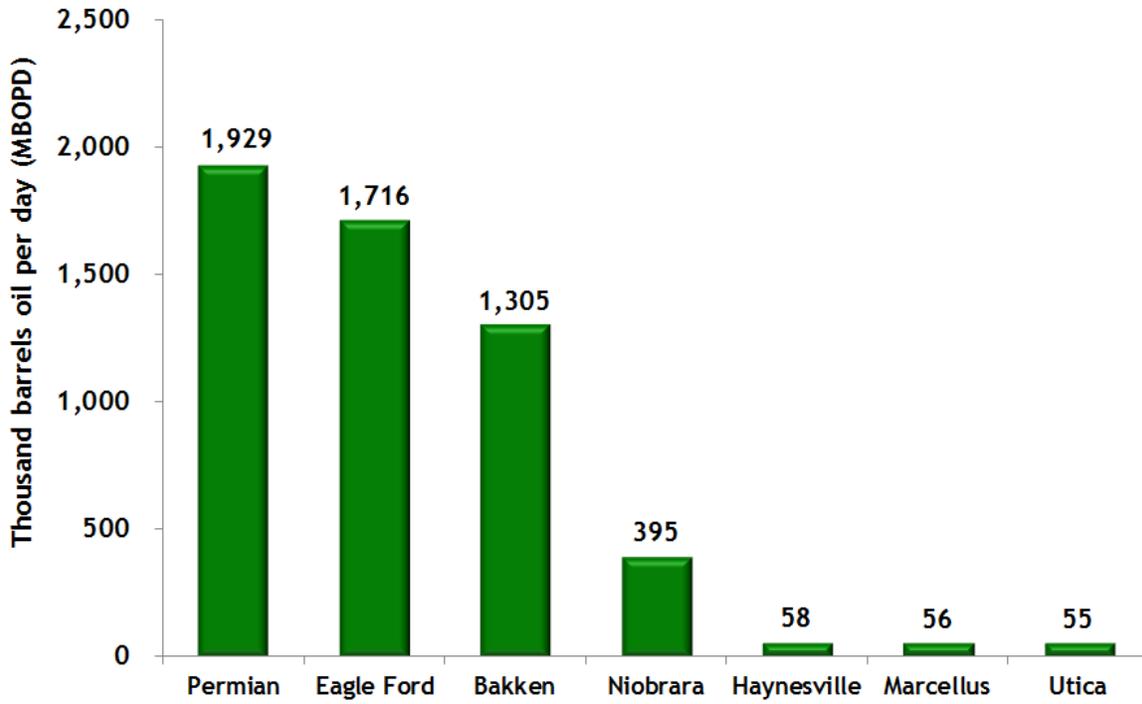
Largest U.S. Oil Fields

PIONEER
NATURAL RESOURCES



1) Cumulative production + estimated remaining recoverable resource
Source: DOE, EIA, ITG and other sources

U.S. Light Tight Oil Production: Selected Regions

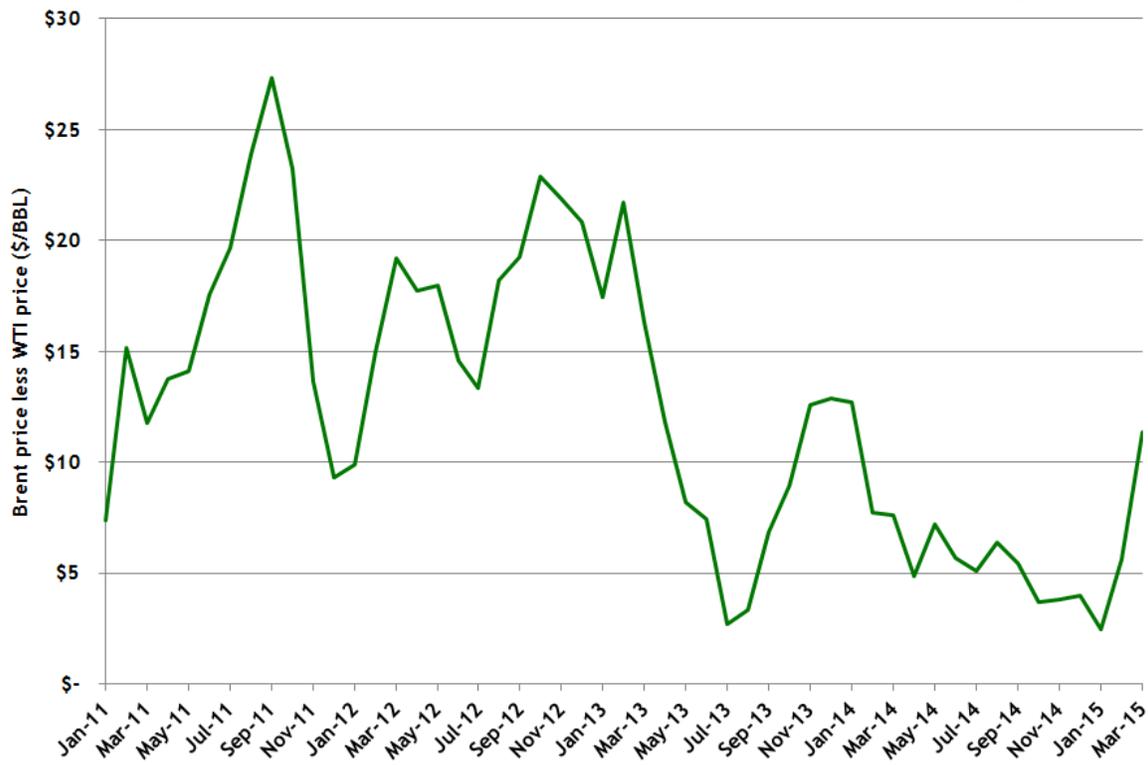


Source: EIA, February 2015 Drilling Productivity Report

Appendix B

Brent - WTI Spread Since 2011

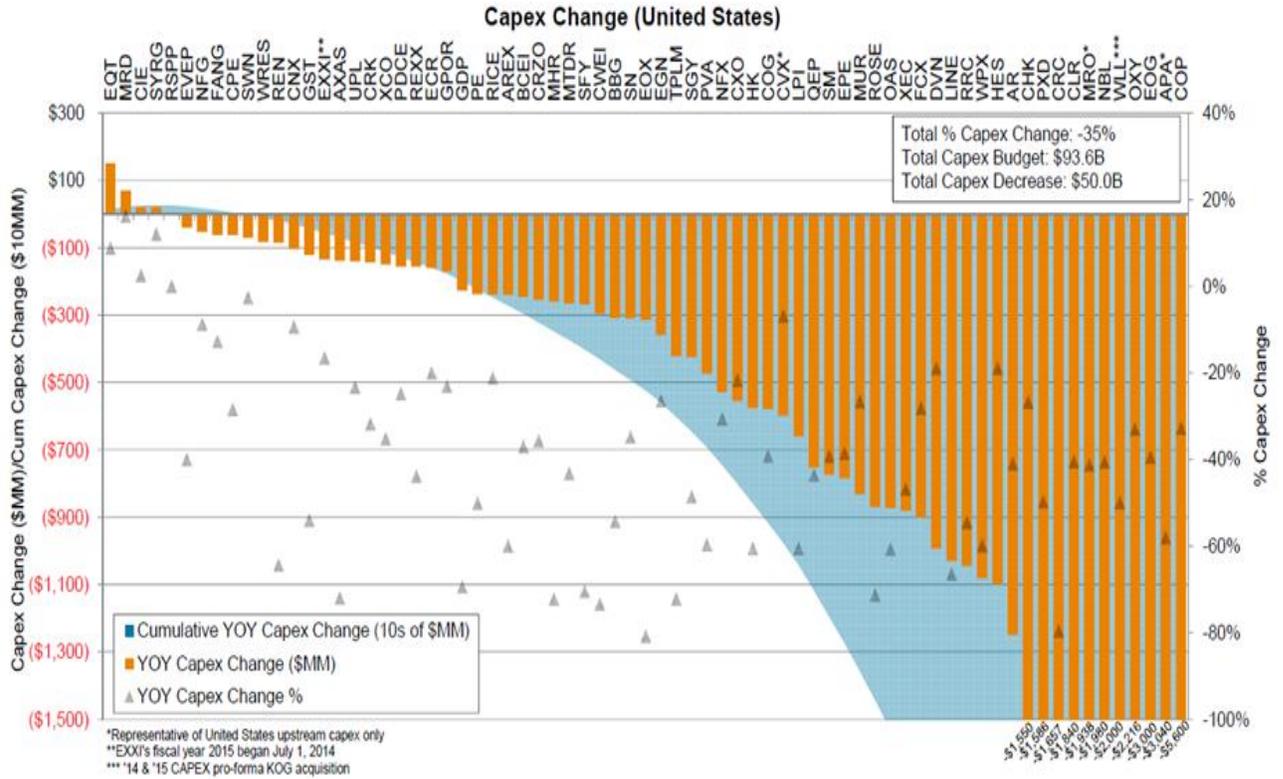
PIONEER
NATURAL RESOURCES



Source: EIA, monthly prices

Appendix C

Announced 2015 Capex Changes—U.S. Public Companies

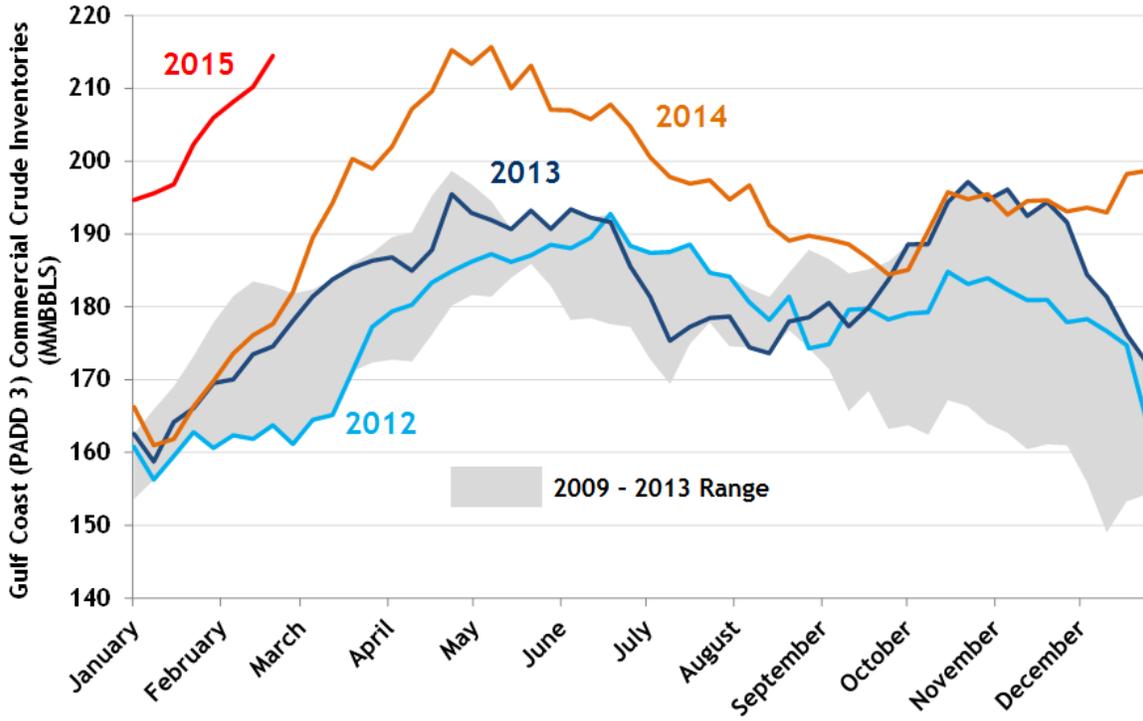


Source: ITG Investment Research

Appendix D

Gulf Coast Crude Inventory Storage Levels Continue to Rise

Total U.S. inventories at 80 year high



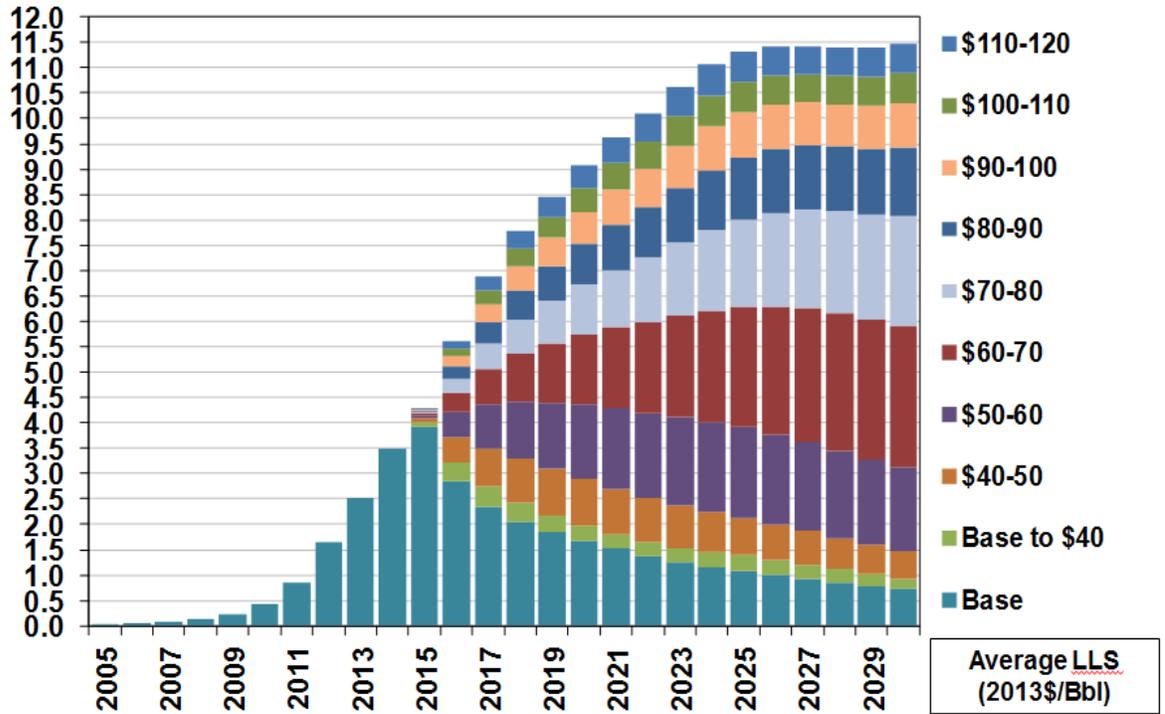
Source: U.S. Energy Information Administration; Weekly Gulf Coast (PADD 3) Ending Stocks excluding SPR of Crude Oil

Appendix E

U.S. Shale Oil Forecast Sensitivity to Oil Price



U.S. Shale Crude and Condensate Production (MMB/D)





WRITTEN STATEMENT OF
AMERICAN FUEL & PETROCHEMICAL MANUFACTURERS
AS SUBMITTED TO THE
SUBCOMMITTEE ON ENERGY AND POWER
Committee on Energy and Commerce
United States House of Representatives

on

**"21st Century Energy Markets: How the Changing Dynamics of World Energy Markets
Impact our Economy and Energy Security"**

March 3, 2015

AFPM Testimony Summary

Hearing before the Subcommittee on Energy and Power: 21st Century Energy Markets: How the Changing Dynamics of World Energy Markets Impact our Economy and Energy Security
March 3, 2015

The United States is in the midst of an energy boom that few predicted even a few years ago. As we now know; however, innovation and entrepreneurship in the energy sector have reversed that trend and the mere fact that Congress is holding this hearing is evidence that previous paradigms are no longer relevant. Led by new technology, U.S. crude oil production increased an incredible 72 percent increase since 2008 and is projected to increase further in the coming years. Of course, these projections are also based on assumptions about future conditions. Issues such as prices, geology, regulatory uncertainty, and technology uncertainties will all impact future production.

The energy renaissance is spurring significant changes in U.S. distribution and refining. Much of the new production is not connected to the refinery delivery infrastructure that existed prior to this tight oil boom. In many cases, required movements represent a reversal of historical flow patterns. As a result, upstream producers, midstream distributors, and refiners are rapidly adapting existing infrastructure while investing in new infrastructure. The rapidly shifting distribution infrastructure has also changed the competitive positions of our refineries.

The U.S. is also home to the world's largest and most advanced refining industry. Our members are the world's leader in refinery throughput and account for more than 20 percent of global fuel manufacturing. The boon in U.S. crude oil production has been a significant factor in keeping U.S. refineries competitive in an increasingly competitive global market.

AFPM is aware there are ongoing questions about whether U.S. refiners are capable of handling new U.S. production. The questions are driven by a key misconception that the existing refining configurations are ill-suited to absorb more light sweet crude. In reality, however, the refining industry is dynamic and is constantly shifting crude slates to maximize efficiency and to meet consumer demand. The facts show that U.S. refiners have plenty of room to accommodate new, domestic supplies of light crude oil, with room to spare.

Refiners have already started to adapt to increased domestic production by reducing imports, increasing utilization, changing the crude mix, and investing in additional refinery changes. The U.S. has reduced crude oil imports from outside North America from 46 percent in 2007 to 23 percent in 2014. Given favorable economics, refineries along the Gulf Coast will continue to back out imports further and invest in equipment to process more light-ends. In fact, this investment is already occurring. However, changing dynamics in domestic and global markets for crude oil and petroleum products, combined with the regulatory environment, create an increasingly uncertain future for many U.S. refineries.

The enormous growth in U.S. crude oil production has naturally led to questions about whether it is time for the U.S. to readdress the crude oil export ban. AFPM believes that the free market should drive all energy policy and does not oppose lifting the ban. However, the refining industry also believes that a more holistic energy strategy is needed to ensure all barriers to free and functioning markets are addressed. Enacting this type of comprehensive energy policy will avoid the mistakes of the past, which have bred a balkanized and conflicting set of priorities and policies that ultimately disadvantage U.S. consumers.

The American Fuel & Petrochemical Manufacturers (AFPM) is a national trade association representing more than 400 companies that encompass virtually all U.S. refining and petrochemical manufacturing capacity. AFPM appreciates the opportunity to share its view on the impacts of the rapidly changing energy markets on the U.S. economy, jobs, and consumers. AFPM's testimony will briefly discuss the state of the global energy markets, regulatory environment, and the refining industry's view on the potential impacts of policy changes.

Changing Energy Picture

Production

The United States is in the midst of an energy boom that few predicted even a few years ago. For decades, U.S. crude production declined and the national energy conversation was too often characterized by fears of scarcity. In reaction to the 1973 OPEC oil embargo, the United States enacted the Energy and Policy Conservation Act of 1975 (EPCA). As originally enacted, EPCA prohibited the export of both crude oil and petroleum products. Through a series of Executive Orders in the 1980's and 1990's, the ban on petroleum products exports and exports to Canada were both eased or lifted, but there was little reason to have a conversation about exporting U.S. crude that most thought was on the permanent decline. More recently, the 2005 Energy Policy Act and the 2007 Energy Independence and Security Act both reflected the scarcity mindset and gave rise to some of the most significant challenges refiners face today.

As we now know; however, innovation and entrepreneurship in the energy sector have reversed that trend, and the mere fact that Congress is holding this hearing is evidence that previous paradigms are no longer relevant. Led by new technology, U.S. crude oil production, particularly in North Dakota and Texas, averaged more than 8.6 million barrels per day (mbpd)

in 2014, an incredible 72 percent increase since production bottomed out at 5 mbpd in 2008. EIA projects that an additional 900,000 bpd of domestic production could come online by 2016. Of course, these projections are also based on assumptions about future conditions. Issues such as prices, geology, regulatory uncertainty, transportation logistics, and technology uncertainties will all impact future production.

When one broadens the lens and considers North America energy production, the picture becomes even brighter. In addition to new production in the U.S., Canada is expected to increase production by 500,000 bpd by 2016 for total new production of 4.2 mbpd. The types of crude are also different, with new Canadian production generally classified as heavy and the vast majority of new U.S. production classified as light. Diversity in crude slates can help ensure that refiners can access different properties to meet demand for different fuel mixes and other products.

Distribution

The energy renaissance is spurring significant changes in U.S. distribution. First and foremost, much of the new production is not connected to the refinery delivery infrastructure that existed prior to this tight oil boom. In many cases, new crude movements represent a reversal of historical flow patterns. As a result, upstream producers, midstream distributors, and refiners are rapidly adapting existing infrastructure while investing in new infrastructure. For example, some pipeline capacity is being adapted by converting natural gas pipelines to crude pipelines. Other pipelines are in planning or construction phases, including the southern leg of Keystone.

However, because our pipeline infrastructure is primarily developed from south to north, moving new supplies east and west has presented a challenge. The industry has responded with significant new investments in rail offloading facilities and terminals at coastal refineries, as well as new and improved tank cars to ensure crude oil can arrive to its destination safely and efficiently. In fact, AFPM members have invested more than \$4 billion on new and safer tank cars in just the past few years. As pipeline infrastructure continues to come online, some such as the North Dakota Pipeline Authority expect rail shipments from the Bakken to level off as pipelines and new small refineries are built in the Williston Basin.

The rapidly shifting distribution infrastructure has also changed the competitive positions of our refineries. For instance, historically Gulf Coast refiners ran more imported crude oil and mid-western refiners imported crude by pipeline from the Gulf. Now, mid-continent refiners are gaining access to reliable and affordable Canadian crude and close-by U.S. crude oil. Similarly, several east coast refiners are now sourcing a much higher percentage of their crude oil domestically rather than continuing the same levels of crude imports. Consider that several refineries in and around Philadelphia, PA nearly closed their doors permanently in 2012. However, those refineries were able to start acquiring U.S.-produced crude from the Bakken region and are still operating today, supporting thousands of jobs in Delaware Valley.

Refining

In addition to climbing the list of major crude oil producers, the U.S. is also home to the world's largest and most advanced refining industry. In total, our members produce more than 15 mbpd of finished petroleum products—primarily gasoline and diesel—making the U.S. the world's leader in refinery throughput and accounting for more than 20 percent of global fuel

manufacturing. Since 2009, U.S. refineries have been able to run at very high utilization rates to meet the needs of the domestic market, while also becoming a net exporter of finished petroleum products, led by diesel exports to Europe and South America. The boon in U.S. crude oil production has been a significant factor in keeping U.S. refineries competitive in an increasingly competitive global market.

AFPM is aware there are ongoing questions about whether U.S. refiners are even capable of handling new U.S. production. The questions are driven by a key misconception that the existing refining configurations are ill-suited to absorb more light sweet crude, which is the primary type of crude being produced from tight formations in the Bakken and Eagle Ford. In reality, however, U.S. refiners have plenty of room to accommodate new, domestic supplies of light crude oil, with additional capacity to further grow U.S. production. The refining industry is constantly shifting crude slates to maximize efficiency and to meet consumer demand.

During the 1980s many refineries—particularly along the Gulf Coast—made investments in order to process heavy, high-sulfur crudes from growing production in nearby areas such as Mexico and Venezuela. Similarly, albeit more recently, some mid-continent refiners have added additional capacity to handle heavier oils from Canada. However, these investments do not preclude those refiners from processing additional light crude oil. Refiners typically run different types of crude oil with different qualities through their processing units. In fact, refiners have already started to adapt to increased domestic production by reducing imports, increasing utilization, changing the crude mix, and investing in additional refinery changes.

First, the domestic crude boom has helped reduce U.S. crude oil imports from 66 percent of U.S. refinery inputs in 2007 to about 45 percent of refinery inputs in 2014. When one removes Canadian and Mexican crude imports, the U.S. has reduced crude oil imports from outside North America from 46 percent in 2007 to 23 percent in 2014. Given favorable economics, refineries along the Gulf Coast will continue to reduce imports and invest in equipment to process more light-ends. In fact, this investment is already occurring. Turner Mason estimates that with limited additional investments, the U.S. has 400 thousand bpd in additional capacity to process domestic production. Further, Turner Mason estimates that if announced investments are included and favorable economics continue, an additional 500,000 bpd of additional refining capacity is possible for a total of 900,000 bpd. This capacity is more than enough to handle the projected 720,000 bpd of lower 48 domestic crude oil production growth that the Energy Information Administration (EIA) anticipates between now and 2016. Over the long-term, if the high-resource cases materialize and the U.S. continues to increase production, a glut of light, high-naphtha crude could occur. However, the precise nature of future production is highly uncertain. One needs to look no further back than the government and industry projections of production in the last decade to show that what we predict today may not reflect reality.

As an example of this uncertainty, it is worth noting one of the more significant shifts in the U.S. energy market is the decline in the U.S. demand for gasoline. In particular, the Energy Information Administration's 2014 projection for gasoline demand in 2030 is almost 43 percent lower than what the agency foresaw in its 2007 Annual Energy Outlook. U.S. demand for distillates such as diesel and home heating oil is slated to rise, but distillate represents a much

lower share of U.S. fuel consumption than gasoline. The decline in gasoline demand is due to a number of factors, including increased vehicle efficiency and changes in consumer behavior.

As a result, U.S. refineries are increasingly utilizing international markets. For example, U.S. export of distillate to Western Europe and Latin America grew by more than 500 percent between 2000 and 2014. Refined product exports allow U.S. refineries to add value to crude oil and maintain the infrastructure that ensures the U.S. has the ability to produce as much product as it consumes. However, international markets are not stagnant and are quickly adapting. Other nations have been expanding their refining capacity and compete with U.S. for global market share. For instance, Saudi Arabia expanded its refining capacity nearly 19 percent between 2012 and 2013. Likewise, Brazil and China have increased refining capacity by 4.6 and 5.6 percent respectively. Much of this investment is being driven by growing demand in non-OECD countries, which account for nearly all the new growth in petroleum product demand. The U.S. is well-positioned to capture international market share provided U.S. policy is structured to allow refineries to effectively compete globally. Unfortunately, U.S. refineries are also the target of increasingly onerous and conflicting regulations.

Regulatory Challenges

The companies operating refineries in the U.S. compete intensely with each other and with global competitors for every gallon sold. It is widely known that consumers make decisions on where to buy gasoline based on as little as one penny per gallon difference. This competition at the corner gas station reverberates up the supply chain. Changing dynamics in the domestic and global markets for crude oil and petroleum products, combined with the regulatory environment, create an increasingly uncertain future for many U.S. refineries.

Leading the list is the Renewable Fuel Standard (RFS), which at its core is the federal government telling consumers that they must use certain types of biofuels in their vehicles. The ethanol volumes mandated by the RFS have risen to the point where they are no longer compatible with existing cars and infrastructure—triggering significant volatility in the market for compliance credits. Those credits, known as Renewable Identification Numbers (RINs) – in the case of corn ethanol these are called D6 RINs - peaked at \$1.46 per gallon in 2013 and averaged around \$0.50 in 2014. Last week RINs were trading at around \$0.72 per gallon. The RFS can limit the supply of gasoline and diesel to the United States based on the amount of renewable fuels consumed in U.S. transportation fuel. In particular, obligated parties can only supply as much gasoline and diesel fuel as they have RINs to meet the RFS obligation that such fuel incurs.

In addition to industry-specific regulations like the RFS, the refining industry also faces government mandated environmental requirements that often conflict with one another. For instance, the proposed ozone NAAQS standard will drive large areas of the country into non-attainment, which will essentially halt any new construction projects and make it harder for refineries to invest in upgrades. A NERA report released just last week estimates that the low end of the proposed ozone NAAQS standard will increase industrial power costs, reduce refining sector output by 0.8 percent, and cause an average annual loss of 1.4 million job equivalents. Last year, EPA finalized its Tier 3 fuel regulations to reduce the sulfur content in fuel, which will require expensive new equipment that will consume more energy and increase greenhouse gas emissions from refineries. Taken together, the U.S. regulatory environment is virtually

unparalleled compared to global competitors, creating a challenge for trade-exposed industries such as refining.

Finally, in addition to reduced demand, increased competition, and environmental regulations, U.S. refiners seeking to ship crude oil between U.S. ports must comply with the Jones Act. The Jones Act, enacted in the wake of World War I, requires shipments moved between U.S. ports to use vessels that are U.S. built and flagged, U.S. majority-owned, and crewed by at least 75 percent U.S. citizens. As a result, it is significantly more expensive to use a Jones Act vessel than it is to ship internationally. In the context of lifting the crude oil export ban, it would be significantly cheaper to ship a barrel of crude from the U.S. gulf coast to Europe, than it would be to simply ship the barrel of crude to an east coast refiner solely because of the Jones Act requirement. European refiners export gasoline to the northeast, competing directly with U.S. refiners in that region. Lifting the export ban without addressing this dynamic would put U.S. refiners at a competitive disadvantage to their European counterparts and seriously hamper the ability of these U.S. manufacturers to compete globally.

Conclusion and Crude Oil Exports in Context

The enormous growth in U.S. crude oil production has naturally led to questions about whether it is time for the U.S. to readdress portions of EPCA, and in particular the crude oil export ban. AFPM believes that the free market should drive all energy policy, and does not oppose lifting the ban. However, the refining industry also believes that a more holistic energy strategy is needed to ensure all barriers to free and functioning markets are addressed. In particular, allowing the export of crude oil without addressing other policies, including the RFS

and the Jones Act, will create disparate regional impacts and could disadvantage some domestic refiners against global competition.

Policymakers should be aware of these issues, seek to mitigate those possibilities, and endeavor to understand the full, fact-based picture as they make decisions of such major import. For example, there is no evidence that the U.S. is currently on the verge of hitting a “refining wall” where it risks shutting in U.S. crude oil production. The refining industry is also investing billions of dollars to handle new domestic production.

Again, AFPM does not oppose lifting the crude oil export ban, but urges Congress to base decisions on the facts while readdressing a suite of anti-free market policies contemporaneously. Enacting this type of comprehensive energy policy will avoid the mistakes of the past, which have bred a balkanized and conflicting set of priorities and policies that ultimately disadvantage U.S. consumers.

As always, AFPM looks forward to working with the Congress to develop an approach to energy policy that will ensure that domestic refiners are able to compete in the global marketplace and minimize economic disruptions.

Summary of the Prepared Testimony of Dr. Graeme Burnett, Senior Vice President, Delta Air Lines
Chairman of the Board, Monroe Energy

The established crude oil export law remains a critically important policy that should remain in place.

- 1) As a result of increased domestic production, we are importing less which means that we are impacting the global supply/demand picture, and crude prices have tumbled as a result *without the need for exports*.
- 2) Refineries have passed along the cost savings from lower-priced inputs on to consumers, a savings of about \$3 per barrel. Barclays calculated annual consumer savings of more than \$9.5 billion in 2013, and projected \$9.6 billion in savings for 2014. Barclays added that the benefit to the U.S. economy is probably even greater than the reported savings as a result of the multiplier effect.
- 3) When oil prices fall, the benefit to consumers outweighs any loss to producers. Investment in oil and gas production is still less than 1 percent of gross domestic product. That pales next to consumer spending, which is 68.5 percent of G.D.P. Hence, current crude oil export policy has *broad-based* economic value.
- 4) Should Congress eliminate restrictions on crude oil exports, lawmakers risk not only hurting the U.S. consumer, but also, and more importantly, endangering energy security. Energy security is not just about producing enough feedstock – that is, crude oil - for the nation’s needs, but also about maintaining the domestic capability to transform that feedstock into the products we consume here in America. Losing American refining capacity would take us further away from energy security.
- 5) Repeal of current law would mean domestic crude oil producers will have the ability to ship oil to refineries in Europe at a lower cost compared to delivering the same oil to refineries located on the East Coast of the United States. This would render domestic refineries, particularly in the Northeast, unable to compete with foreign refineries.
- 6) U.S. refineries have the capacity to handle the increased domestic production, while displacing imports, keeping jobs here in the U.S. and simultaneously benefiting American consumers.
- 7) As a result of OPEC’s influence, the crude oil market is not a true “free market.”
- 8) The general public opinion overwhelmingly supports leaving the crude oil export law in place.

Prepared Testimony of Dr. Graeme Burnett, Senior Vice President, Delta Air Lines
Chairman of the Board, Monroe Energy

House Energy and Commerce Committee
Subcommittee on Energy and Power
Hearing: "21st Century Energy Markets: How the Changing Dynamics of World
Energy Markets Impact Our Economy and Energy Security"
March 3, 2015

Good afternoon: Chairman Whitfield, Ranking Member Rush, and Members of the Committee.

Thank you for inviting me to testify before you today.

My name is Dr. Graeme Burnett. I have been involved in the refining and petrochemical industry for over 30 years. Before joining Delta Air Lines, I worked in various capacities in Texas and across the globe, including the Middle East, Asia, Europe and South America for one of the top 5 international oil companies. I am currently the Senior Vice President for Fuel Optimization at Delta Air Lines. In this position, I manage Delta's jet fuel supply as well as serve as Chairman of the Board of Monroe Energy, the company that owns and operates Delta's refinery in Trainer, Pennsylvania.

As some of you may know, Delta purchased the Trainer refinery from Phillips 66 back in 2012. The acquisition of the Trainer refinery was an innovative approach to managing our largest expense—jet fuel. Delta's purchase of the Trainer facility has not only helped manage our fuel costs, but has also created over 400 jobs at the once-shuttered Trainer facility.

Delta Air Lines, like other airlines, participates in oil markets on a daily basis. The price of jet fuel contributes to the price of an airplane ticket, influences the types of aircraft we purchase, and helps determine the routes we serve. Because of these factors, we are uniquely situated – both as an end user of crude oil and as a refiner – to comment on the longstanding crude oil export law and the current debate over whether to repeal it.

We strongly believe the established crude oil export law remains a critically important policy that provides significant benefits to American consumers.

As a result of increased domestic production, the simple fact that we are importing less means that we are impacting the global supply/demand picture, and crude prices have tumbled as a result *without the need for exports*. Last summer, as a result of domestic oil production, U.S. refineries were running at record-high levels. Those refineries passed along the cost savings from lower-priced inputs on to consumers, a savings of about \$3 per barrel, as a report from Barclays Equity Research has affirmed. Barclays calculated annual consumer savings of more than \$9.5 billion in 2013, and projected \$9.6 billion in savings for 2014. Barclays added that the benefit to the U.S. economy is probably even greater than the reported savings as a result of the multiplier effect.

The impact of lower fuel prices upon consumers and the economy cannot be overstated.

My fellow panelist, Adam Sieminski of the U.S. Energy Information Administration, noted in a recent speech that the EIA has projected the average American household will spend about \$750 less on gasoline in 2015 compared to the prior year. Taken together with lower home heating oil costs, some American households stand to save as much as \$1500 this year from lower fuel costs. As reported in *The Washington Post* at the end of 2014, across the country, American motorists saved \$630 million on gasoline compared with what they were paying at the beginning of last summer. The article further estimated the total windfall to the American consumer could top \$230 billion in 2015.

These savings on fuel go straight back into American consumers' pockets, allowing them to use that savings in more productive ways, such as on goods and services, whether that's groceries, clothing, household goods, and on and on. That consumer activity stimulates the economy broadly.

Reports from Goldman Sachs and the American Enterprise Institute have characterized lower fuel prices as equivalent to an enormous, broad-based tax cut, worth billions to consumers. As Dean Maki, chief United States economist at Barclays, notes, when oil prices fall, the benefit to consumers outweighs any loss to producers. Investment in oil and gas production is still less than 1 percent of gross domestic product. That pales next to consumer spending, which is 68.5 percent of G.D.P. Hence, current crude oil export policy has *broad-based* economic value.

So the question arises: Why would any policymaker want to risk jeopardizing the current consumer benefits we are experiencing and institute a policy that would benefit only a narrow sector of the economy?

Should Congress eliminate restrictions on crude oil exports, lawmakers risk not only hurting the U.S. consumer, but also, and more importantly, endangering energy security. Energy security is not just about producing enough feedstock – that is, crude oil - for the nation’s needs, but also about maintaining the domestic capability to transform that feedstock into the products we consume here in America. Losing American refining capacity would take us further away from energy security.

Repeal of current law would mean domestic crude oil producers will have the ability to ship oil to refineries in Europe at a lower cost compared to delivering the same oil to refineries located on the East Coast of the United States. This would render domestic refineries, particularly in the Northeast, unable to compete with foreign refineries. **Put simply, lifting the ban will benefit European refinery workers at the expense of thousands of American jobs while endangering U.S. refining capacity that is critical to our national security.**

Oil producers want to export crude for one reason only: to get higher prices. Current law lowers the price to producers only if (a) they can’t get the crude to market because of logistics constraints or (b) the refineries are unable to process it.

In response to the logistics issue, there is a plethora of pipeline projects either completed or in progress.

The claim by some producers that U.S. refineries cannot absorb this new production is a myth. In fact, there is no need to send U.S. crude abroad because refiners here in the United States have the capacity to handle the increased domestic production. An analysis done last year by energy experts Baker & O'Brien conclusively demonstrated that the U.S. refining industry will invest in capacity to absorb an additional 3.1 to 4.3 million barrels per day of domestic oil. This estimate exceeds the Energy Information Administration's highest forecast for incremental oil production for the remainder of this decade.

In the meantime, U.S. refiners are expanding domestic crude processing capacity, while displacing imports and simultaneously benefiting American consumers. This ability to adapt to changing market dynamics is lowering fuel prices, creating jobs at home and increasing energy security.

Despite the increase in domestic crude production, the U.S. continues to import 33 percent of its crude oil needs from outside of North America. Unlike LNG, there is no real "excess" requiring export.

Another myth I wish to dispel is that allowing exports will reduce OPEC's influence. It is important to remember a very key point: the crude oil market is not a true "free market." The long-term, well-documented level of control over crude oil markets exhibited by national oil companies and the OPEC cartel virtually eliminates any claim that such markets are free or open.

With its market power, OPEC alone effectively influences 35 percent of crude oil production and supplies worldwide, impacting pricing through quotas and other controls, including access to crude oil. Saudi Arabia's decision not to cut production and allow prices to crash, in order to maintain market

share and reduce non-OPEC production, such as U.S. shale oil, clearly demonstrates that they are the controlling factor for crude price. Furthermore, a recent publication by BP shows that OPEC will ride out the threat from U.S. shale and ultimately raise its market share over the next two decades.

Refining American oil at home allows Americans to create petroleum products such as jet fuel, gasoline, and home heating oil at lower costs while simultaneously reducing the nation's dependence on foreign oil. If the law on crude oil exports is repealed, crude oil will be shifted out of a competitive market into a less competitive global market controlled by a few oil-producing states. Common sense dictates that this will cause prices of oil products to rise and negatively impact U.S. consumers' pocketbooks.

Delta's position is clear: there is no imperative to repeal the law regulating the export of crude oil. If export restrictions are lifted, feedstock cost will rise, U.S. refining capacity will be reduced, jobs will be lost, and the consumer will pay higher prices at the pump. It's better for America to maintain present law and export the refined products.

Finally, as this Committee continues to gather information on the impact of crude oil export restrictions, it is imperative to remember that the general public opinion overwhelmingly supports leaving the crude oil export law in place.

Monroe Energy is a member of a group called The CRUDE Coalition - Consumers and Refiners United for Domestic Energy. Last year, CRUDE engaged the University of New Hampshire Survey Center to poll voters in New Hampshire on their opinions regarding U.S. crude oil export policy. The survey results were overwhelmingly in favor of keeping the current export law. Key survey points:

- Two thirds of New Hampshire voters believe the U.S. is importing too much oil from foreign countries, with 86% agreeing that the U.S. should reduce the amount of oil imports from the Middle East and other countries before exporting domestic crude.
- 85% of Granite Staters agree the U.S. should limit exports of crude oil if doing so keeps gasoline prices from rising in the US.
- 78% of New Hampshire voters want the government to be certain about the impact of crude oil exports on gasoline prices before the current law is changed.

The results of the New Hampshire survey clearly demonstrate that voters want energy independence and a reduction of crude oil imports before policymakers even consider allowing crude oil exports.

And other independent polls confirm our findings. For example, in December, Hart Research released a nationwide poll showing that large majorities of voters across party lines oppose exporting more U.S. oil to foreign countries.

Keeping U.S. crude oil in America benefits Americans in the broadest way possible, impacting both families and businesses. The current export restrictions have helped keep prices for petroleum products lower than they otherwise would have been. And the law has ensured a robust refining sector and helped preserve refining expertise here in this country. Our nation's economic and security interests are best served by allowing American refiners to add value to crude oil here and becoming less reliant on higher-cost foreign crude from unstable places like Libya, Nigeria, Venezuela and the Middle East.

As they say in the medical profession, "first do no harm" – the burden of proof lies with those who would seek to alter a longstanding pillar of our nation's energy security policy.

Thank you for this opportunity to testify before the Committee. I look forward to answering any Member questions.

STATEMENT OF BRAD MARKELL

EXECUTIVE DIRECTOR

AFL-CIO INDUSTRIAL UNION COUNCIL

Before the

COMMITTEE ON ENERGY AND COMMERCE

SUBCOMMITTEE ON ENERGY AND POWER

U.S. HOUSE OF REPRESENTATIVES

MARCH 3, 2015

Chairman Whitfield, Ranking member Rush, and Members of the Subcommittee, thank you for inviting the AFL-CIO to share its views on the important topic of 21st Century Energy Markets. The AFL-CIO is the largest labor federation in the nation, consisting of 56 unions with 12.5 million members.

Growing domestic oil production is providing the United States with a significant economic boost and a significant reduction in our dependence on foreign oil. The petroleum refining business is an economic powerhouse, as detailed data from the Census Bureau make clear, and as the American Petroleum Institute has documented over the years.

In July 2014, the AFL-CIO Executive Council unanimously passed a policy statement opposing lifting the existing restrictions on crude oil exports, titled “America Should Exploit the Advantages of Domestic Oil Production, Not Give Them Away¹.”

I want to spend most of my time today making sure the committee understands our views on the economic importance of the refining industry, and why it would be a bad idea for the United States to lift or significantly modify the existing restrictions on the export of crude oil

Gas Prices Likely not Affected

First, while the attention given to the effect easing restrictions on the export of crude oil would have on domestic gasoline prices is understandable, a focus on this question to

the exclusion of other issues is not helpful in understanding which path the U.S. should choose.

The price of gasoline is set on the international market, and as the October 2014 Energy Information Agency report “What Drives U.S. Gasoline Prices?” says, the price of gasoline in the U.S. is best explained by the price of Brent crude oil. That report has seven key observations, including these threeⁱⁱ:

- Gasoline is a globally traded commodity and, as a result, prices and changes in prices are highly correlated across global spot markets.
- Brent crude oil prices are more important than WTI crude oil prices as a determinant of U.S. gasoline prices in all four regions studied, including the Midwest.
- The effect that a relaxation of current limitations on U.S. crude oil exports would have on U.S. gasoline prices would likely depend on its effect on international crude oil prices, such as Brent, rather than its effect on domestic crude prices.

The Economic Importance of the Refining Sector

The refining sector is an economic powerhouse, and easing restrictions on crude oil exports threatens the long-run health of the sector and the high-quality jobs it provides. The threat of these job losses is concentrated in the Gulf of Mexico states.

Simply put, if we lift the ban on crude oil exports, we will export both our oil and the jobs and economic activity associated with refining that oil. Over time, with no restrictions on the export of crude oil, the refinery sector will have meaningful incentives to increase operations outside the United States to lower both labor and environmental compliance costs. The U.S. would lose some of the jobs it has now, and fail to create jobs to process increased domestic light oil production volumes.

And the jobs that could be lost are very good jobs. According to the 2012 Economic Census performed by the Census Bureau, the average job in the refining sector paid over \$100,000 per year, supported by \$1.8 million in value-added per employee.ⁱⁱⁱ

According to the Economic Census, while the industry paid its employees \$9.7 billion in total compensation, it also spent \$8.9 billion on professional services, repair and maintenance services, and leased employees. The industry is a significant employer of workers in building and construction trades occupations.

In 2012, refineries made over \$15 billion in capital investments. Their importance to our economy goes beyond the numbers, as the American Petroleum Institute put it in 2011, when it was making the case for domestic refining:

“The United States will depend on refining petroleum-based products for much of its energy needs for decades to come. And, domestic refineries are competing directly with petroleum product imports. Because the refining industry operates

on a global basis, America faces the choice of either manufacturing these products at home or importing them from other countries.

U.S. refinery closures would result in domestic job losses and lower government revenue in the form of taxes. It would also result in a greater reliance on foreign refineries, such as those being developed in the Middle East and India.^{iv}

Additionally, the output of U.S. refineries is critical to U.S. petrochemical manufacturing, with a large part of U.S. refinery output integrated with follow-on petrochemical manufacturing. If the U.S. refining capacity declines over time, the petrochemical industry would also likely decline, compounding the economic damage from allowing crude oil exports.

Market Instability Increases Policy Risk

This is a particularly bad time to be considering changes to crude oil export restrictions. The oil market is in the throes of a drastic realignment that we do not entirely understand, and there is a great deal of uncertainty about the short-term resolution. EIA Administrator Sieminski recently pointed out that the market-implied 95% confidence band for WTI is extremely wide - \$35 to \$100 per barrel in 2015 and 2016.

The amount of tight oil produced in the United States is dependent on the market price of West Texas Intermediate oil. It is unwise to consider major policy changes until the

world oil market stabilizes and we understand with greater certainty how much oil can be economically produced in the United States.

It will also take some time to sort out the effects of the Department of Commerce's "clarification" of its policies regarding processed condensate. Significant exports of condensate are possible, and reports of both condensate exports and investments in condensate splitters are in the press^v.

Condensate exports of course represent volumes that could otherwise have been processed further into completed fuels in the United States, with all the same economic benefits of job creation and supply-chain spending as the rest of the refinery sector.

The Refining Sector can Retool to Use More Light Oil

Much of the discussion of oil exports focuses on the mismatch in refinery capacity, with U.S. refineries configured to handle more heavy oil and lacking capacity optimized for light oil. In this static view of the industry, the easiest fix for the "problem" is to reduce imports of light crude oil, and then export any remaining domestic light crude oil unprocessed.

Indeed, according to EIA's oil import tracking tool, imports of light oil to the U.S. Gulf Coast region have declined from 1.7 million barrels a day in 2009 to just 0.26 million barrels a day in 2014 – an 85% decline^{vi}.

Rather than export the domestically produced light crude oil that U.S. refineries are not optimized to process, there is another solution, one that emphasizes investment in America, and expanding employment for American workers.

In 2014, McKinsey examined the implications of increased domestic production of light, tight oil (LTO) on refiners, under scenarios where the crude oil export ban is not lifted.^{vii} McKinsey believes that "...the continued growth of LTO in North America has the potential to drive a fundamental restructuring of the downstream industry in North America and beyond."

The report's 2020 scenario says that Gulf Coast refineries could see their light tight oil inputs increase to around 50% of all crude used, backing out imported crude oil. This will require refiners to remove bottlenecks in the light-ends part of their distillation units, or to add new distillation capacity optimized for light tight oil.

Domestic production of oil is projected to remain above 8 million barrels a day through at least 2035; the question is not whether this oil will be produced, but where it will be refined. It should be refined in the U.S. so we can reap the full bounty of jobs, economic activity and energy security that our increased production of crude oil makes possible.

Increasing Insecurity in Oil-Producing Regions Should Counsel Caution

Political and military tensions in the Middle East are worse than they have been in decades. No one can say with any confidence what the situation will be in five or ten

years. After some success in increasing oil production, Libya is again the scene of turmoil and terrorism. Nigeria faces an extremely precarious political situation and a brutal armed insurgency. Venezuela is in a political and economic crisis. The situation regarding Russia's international relationships remains fluid and troubling.

Taken as a whole, the ongoing instability in nations crucial to the international supply of crude oil threatens the energy security and economic prosperity of the United States. After our success in reducing our dependence on imported oil, the last thing we should consider is throwing away that success by lifting the restrictions on crude oil exports.

Exporting crude oil when the U.S. will be a net petroleum importer for the foreseeable future, and when foreign sources of oil are facing considerable instability would be an ill-advised and shortsighted choice – and make no mistake, the American public knows that this is a choice that will be made here in Washington D.C.

The Best Use of Abundant Domestic Crude Oil is to Transform It into High Value Added Products that can be Sold around the World.

The position of the AFL-CIO is premised on the belief that in the end, markets win out. Economically exploitable fossil fuels do not stay in the ground, they are produced when the price is high enough.

Just as the refining sector made significant investments to handle more heavy oil, so too will investments be made to handle more light oil feedstock efficiently.

The simple question before us is where do we want oil produced in the United States to be refined and made into products? Would we prefer that billions be invested in the U.S., or overseas? Would we prefer to expand the domestic petrochemical capacity that feeds so many of our basic industries, or would we prefer that it too go off shore as the feedstock it depends on is exported?

When we refine domestic crude oil, we create high-quality jobs that the United States desperately needs. The jobs that could be created would be concentrated in areas where the refining and petrochemical industry are already situated – primarily in Gulf Coast States. If we allow exports of crude oil, that is where, especially over the long run, jobs will be lost.

For the AFL-CIO, the choice is clear. We are unabashedly for creating as many American jobs as possible from the increased domestic production of oil. That means keeping the current crude oil export restrictions in place, not sending crude oil, and the jobs it creates, overseas.

ⁱ <http://www.aflcio.org/About/Exec-Council/EC-Statements/America-Should-Exploit-the-Advantages-of-Domestic-Oil-Production-Not-Give-Them-Away>

ⁱⁱ <http://www.eia.gov/analysis/studies/gasoline/pdf/gasolinepricestudy.pdf>

ⁱⁱⁱ <http://www.census.gov/econ/isp/sampler.php?naicscode=32411&naicslevel=5>

^{iv} http://www.api.org/~media/files/oil-and-natural-gas/refining/api_case_for_us_refining_summary.pdf

^v <http://www.maritime-executive.com/article/bp-exports-super-light-crude-from-texas>

http://ir.marathonpetroleum.com/phoenix.zhtml?c=246631&p=irol-newsArticle_pf&ID=1879930

<http://www.reuters.com/article/2014/12/08/phillips66-condensate-splitter-idUSL1N0TS24420141208>

<http://www.kindermorgan.com/projects/condensate>

^{vi} <http://www.eia.gov/todayinenergy/detail.cfm?id=19931>

^{vii} http://www.mckinsey.com/~media/mckinsey/dotcom/client_service/oil%20and%20gas/pdfs/797317%20implications%20of%20light%20tight%20oil%20growth.ashx