2017

ENERGY IS EVERYTHING

STATE OF AMERICAN ENERGY

AMERICAN PETROLEUM INSTITUTE

INTRODUCTION

MESSAGE FROM JACK GERARD

API PRESIDENT AND CEO

Energy is fundamental to our society. Our ability to responsibly produce, safely distribute, store and efficiently consume the energy we need to maintain our standard of living while lessening the impact on the environment is crucial to our shared goal of a better future for the next generation.

The 2017 State of American Energy report looks at today's energy reality: how energy intersects with our daily lives, and how we can reach our nation's bright energy future if we make the right policy choices today. This year's report coincides with the beginning of a new chapter in American history, the start of a new administration and Congress. Last year, polls consistently said voters from both parties wanted our nation's leaders to address economic growth and accelerate job creation. And all voters want an energy future that respects and protects our air, land and water, and that provides reliable, affordable energy for our daily lives. The right energy policies are critical to accomplishing all of these goals.

The very ubiquity of oil and natural gas as a source of electricity, fuel and manufacturing feedstock for everyday products makes our nation's energy discussion more than a collection of abstract policy positions or partisan talking points. Ultimately, energy policy is about the direction, quality and prosperity of our lives and the economic opportunity of future generations. President Trump and the incoming Congress will inherit a country with a growing population and economy at a time of historic domestic energy production. All while, according to the Energy Information Administration (EIA), greenhouse gas emissions from electricity generation are at their lowest point in 25 years thanks to increased use of North American natural gas.

For the American consumer, the nation's energy renaissance has meant lower energy costs, an average of more than $550 saved on gasoline costs, according to the American Automobile Association (AAA).[1] And American families saved, on average, $1,337 in 2015 through lower home energy costs[2] as well as lower costs of goods and services as a result of the abundant supply of North American natural gas. None of this happened by chance. America's ability to become a global energy leader in less than a decade is the result of market-driven innovations and private sector entrepreneurial forces. These gains and tangible benefits to consumers underscore what's at stake when it comes to our nation's energy future.

This year's State of American Energy report provides a close look at the state of modern American energy: the benefits of the American energy revolution to consumers through lower costs and to the environment, thanks to abundant, cleaner-burning, domestically produced natural gas; and the need to improve and expand our nation's energy infrastructure and maintain our place as a global energy leader.

The report examines how, in ways large and small, energy touches every part of our daily lives. And it provides a broad vision for what our nation's energy future should be in order to take full advantage of our energy resources, maintain our position as the world's leading producer of oil and natural gas, and continue to provide American consumers with abundant, affordable and reliable energy.

The 2017 State of American Energy report makes clear that the policies our elected representatives choose and the actions they take today will determine whether this nation's 21st century energy renaissance endures and delivers the energy, economic opportunities and national security through global energy leadership that Americans today and in the future deserve.

ENERGY IS ALL AROUND US. ENERGY IS ... EVERYTHING.

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ENERGY TODAY

…IS WHAT MOVES US.

ENERGY REVOLUTION

Lowered Consumer Costs

Energy is the foundation upon which our modern society rests. Today, our nation is the world's leading producer of oil and natural gas.

The 21st century energy revolution – brought about by advances in the decades-old technology of hydraulic fracturing and innovations in horizontal drilling – has positively touched the lives of all Americans. Whether through increased economic opportunity, enhanced national security or the abundance of affordable North American oil and natural gas, this revolution is the driving factor in a cleaner environment and lower energy costs for the average American consumer.

For example, according to a 2016 estimate from AAA, America's drivers, on average, saved more than $550 on gasoline in 2015[3] due to increased production from hydraulic fracturing and horizontal drilling. And an analysis by EIA shows that since 2008, roughly the start of the energy renaissance, average annual energy costs per household in the United States have dropped by more than 14 percent.[4]

It is important to remember that American energy policy has consequences beyond our borders. American energy leadership could help improve the lives of millions of families in countries and continents thousands of miles away, by providing an affordable and cleaner-burning fuel to heat their homes and cook their meals. The International Energy Agency estimates that more than 1.2 billion people, or 14 percent of the world's population, lack access to electricity, and twice that many, 2.6 billion, live without clean cooking facilities.[5]

In fact, according to a 2013 study in The Lancet, roughly 3.5 million people, mostly women and children, die every year from respiratory illness as a result of indoor air pollution created by wood and other biomass stoves.[6] American global energy leadership could help significantly increase the number of families with access to the clean, affordable energy they need to live healthier and more productive lives.

None of this progress or the potential of America's enormous energy resources are guaranteed to continue. If lawmakers pursue energy policies that constrain domestic oil and natural gas production, particularly from hydraulic fracturing and horizontal drilling, they could consign future generations of Americans and millions of people around the world to a less prosperous and productive future, because those energy production technologies account for the bulk of our nation's increased energy production.

Today, according to EIA, two-thirds of America's natural gas comes from hydraulically fractured wells.

Policies that hinder this decades-old, proven method of energy production could result in higher energy costs for America's consumers, by reducing supply at a time of growing demand for energy from all sources.

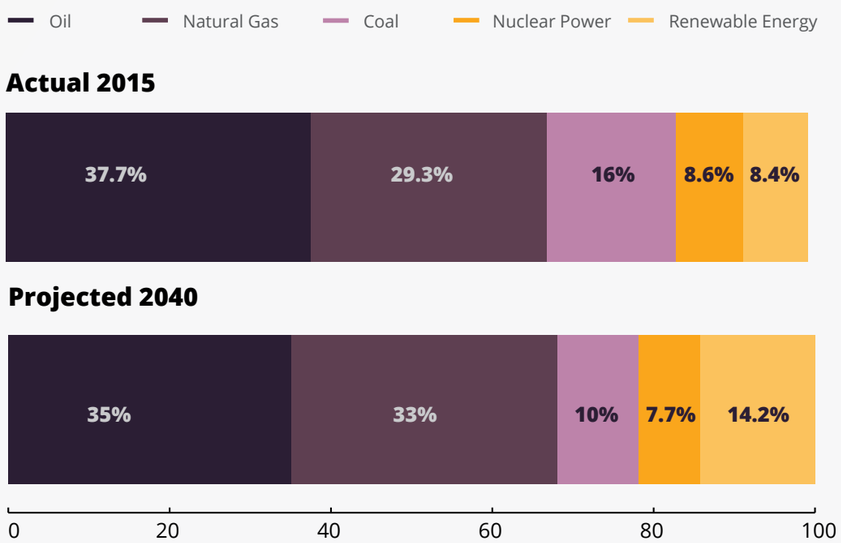
America's energy revolution allows our nation to play an important role in meeting the world's future energy needs. There is little doubt that we need more energy far into the future.

It is clear, based on the consensus opinion of most experts, including the EIA, that it is unrealistic to suggest that we can meet our future energy needs without fossil fuels. The reality is that, while renewable fuels are an important part of our nation's energy equation, the high-growth renewables remain intermittent and therefore unable to provide a consistent and reliable base for electricity generation. Conversely, natural gas provides a steady, reliable and cost-effective base that lowers costs for consumers and also provides flexibility that makes the use of more intermittent sources of energy feasible.

Total Energy Consumption by Fuel

2015–2040

Source: Annual Energy Outlook 2016, Total Energy Supply, Disposition, and Price Summary.



ENERGY BRIEF

AMERICAN ENERGY DRIVES AMERICAN COMPETITIVENESS

The American energy revolution has done more than just provide record amounts of oil and natural gas to fuel our transportation needs or generate electricity and heat our homes, schools and businesses. Increased American energy production has lowered the cost of energy and manufacturing feedstocks, which helps to cut energy and materials costs for American manufacturers, particularly producers of steel, chemicals, refined fuels, plastics, fertilizers and numerous consumer products. U.S. industrial electricity costs are 30 to 50 percent lower than those of our foreign competitors, according to a 2015 study[i] from the Boston Consulting Group (BCG). American manufacturing costs are now 10 to 20 percent[ii] lower than those in Europe and could be 2 to 3 percent lower than China's by 2018. Lower energy prices give U.S. industries a crucial competitive edge and are attracting more business investment back to the U.S.

America's energy advantage translates, via lower product costs, into the household savings mentioned previously, and it also helps generate economic growth and jobs. According to the American Chemistry Council, chemical production grew 3.6 percent in 2015 and is projected to continue to increase through 2020 as new capacity from 266 new, announced projects and over $164 billion of investment comes on line.[iii] Further, BCG found that lower electricity and natural gas fuel costs are "beginning to drive investments such as new iron and steel plants and plastics processing."

Crude oil and natural gas are the building blocks of many everyday medicines such as antihistamines. They are essential to modern fertilizers that ensure a plentiful supply of affordable and safe food, and also provide the feedstocks that make modern agriculture possible. In short, oil and natural gas not only provide the power our nation and the world needs, they also help feed people. All of which means that we'll need more energy, from all sources, with oil and natural gas as the base, for decades to come.[iv] In fact, the EIA projects that global energy consumption will increase 48 percent by 2040,[v] largely due to expanding economic opportunities in developing nations. Further, 78 percent of global energy needs will be met by fossil fuels.

In the United States, oil and natural gas will supply 68 percent of energy needs by 2040,[vi] even under the most optimistic scenarios for renewable energy growth. In less than a decade, our nation's energy reality has changed from scarcity, uncertainty and dependency to abundance, security and global energy leadership. Today the United States is the No. 1 producer of oil and natural gas on the planet, thanks largely to innovations in the decades-old technique of hydraulic fracturing coupled with advances in horizontal drilling and the dedication of millions of women and men in the oil and natural gas industry.

[i] **Boston Consulting Group and Harvard Business School, "America's Unconventional Energy Opportunity," June 2015,** http://www.hbs.edu/competitiveness/Documents/america-unconventional-energy-opportunity.pdf
[ii] **Fortune, "U.S. Manufacturing costs are almost as low as China's, and that's a very big deal," June 2016,** http://fortune.com/2015/06/26/fracking-manufacturing-costs/
[iii] **American Chemistry Council, "Energy outlook to 2040: Chemicals and plastics growth — in the U.S. and globally," February 2016,** https://blog.americanchemistry.com/2016/02/energy-outlook-to-2040-chemicals-and-plastics-growth-in-the-u-s-and-globally/
[iv] **EIA, "Oil: Crude and Petroleum Products Explained," June 2016,** http://www.eia.gov/energyexplained/?page=oil_home
[v] **EIA, "International Energy Outlook 2016," May 2016,** http://www.eia.gov/outlooks/ieo/world.cfm
[vi] **EIA, "Annual Energy Outlook 2016," September 2016,** http://www.eia.gov/outlooks/aeo/section_energyconsump.cfm

Fueling America's Economy

A strong U.S. refining sector is essential to our nation's economic growth.

Our nation's refineries provide us with high-quality fuels used for transportation, energy for heat and light, and petrochemicals needed to manufacture the products we use every day.

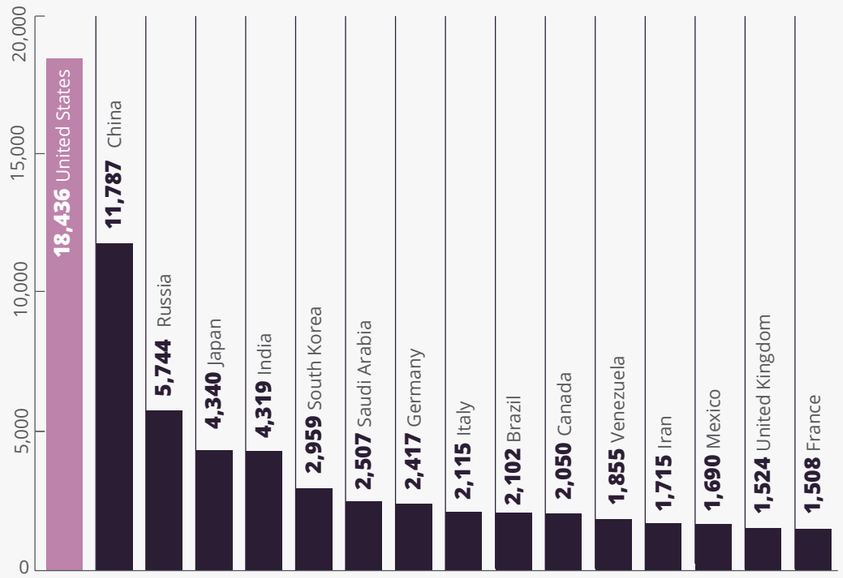
With an annual salary that, on average, is more than twice[7] the national average, U.S. refiners support $98 billion in wages and benefits annually, and support more than 1.2 million jobs all along the skills continuum.[8] Every year U.S. refiners contribute approximately 1.8 percent to the U.S. GDP.

Our nation's world-class refineries provide fuels and petrochemical feedstocks needed to manufacture thousands of everyday products, such as plastics, pharmaceuticals, fertilizers and more. Today, U.S. refining capacity exceeds 18 million barrels per day,[9] its highest level in 35 years, and domestic refiners are upgrading their operations to produce cleaner fuels and meet the needs of the American consumer. In fact, they spent $154 billion between 1990 and 2014 on producing cleaner-burning fuels.[10]

Crude Oil Refining Capacity

Thousand Barrels Per Calendar Day

Source: EIA, Refinery Utilization and Capacity; and OPEC, Oil and Gas Data - World Refining Capacity by Country, http://www.opec.org/library/Annual%20Statistical%20Bulletin/interactive/current/FileZ/Main-Dateien/Section3.html.



ENERGY BRIEF

RENEWABLE FUEL STANDARD

Renewable fuels have been mandated under federal law for over a decade, since the passage of the Renewable Fuel Standard (RFS), and current RFS policy is broken, outdated and ineffective. The RFS constrains free market forces, supports uneconomic activity and limits consumer choice. It is based on both supply and demand assumptions that have proven false over the past decade, and sets aspirational goals that have proven unachievable; the RFS must be repealed or significantly reformed.

Today's gasoline demand is 10 percent lower than EIA's outlook at the time of the passage of the RFS. And, as a result of technologies that spurred an energy renaissance, crude oil and natural gas resources are more than 63 percent higher than EIA projections at the time of the passage of the RFS.[1] As we approach the 10 percent ethanol threshold in our fuel mix, which could mean substantial economic harm to American consumers, it is imperative that Congress revisit this broken RFS policy.

When the RFS was first implemented about a decade ago, our nation's energy policy was focused on addressing long-term scarcity and increased energy dependence. America's 21st century energy renaissance has transformed our nation's energy trajectory to one of abundance and energy security, which undercuts the basic premise of the RFS. Further, purely aspirational volume goals have been promoted that bear little reality to market conditions.

API proposes limiting the volume of mandated ethanol to avoid breaching the blend wall, emphasizing free market principles that protect American consumers and the automobiles that we drive.

[1] API Calculations from EIA Technically Recoverable Resources Data from EIA's 2008 and 2015 Annual Energy Outlooks, http://www.eia.gov/oiaf/archive/aeo07/assumption/pdf/oil_gas.pdf and http://www.eia.gov/outlooks/aeo/assumptions/pdf/oilgas.pdf

Fueling Our Future

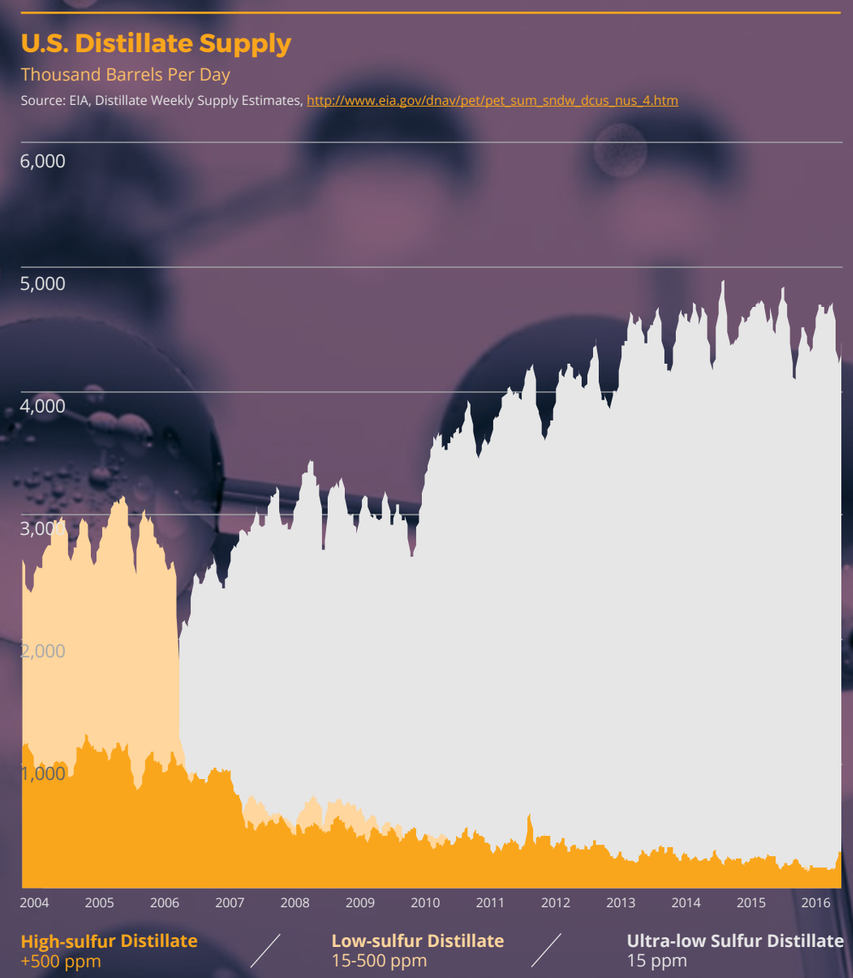
The combination of cleaner gasoline and diesel fuels, modernized equipment and facilities and more fuel-efficient vehicles has helped reduce U.S. air pollutants by 70 percent between 1970 and 2014[11] even as vehicle miles traveled increased by more than 174 percent, according to the U.S. Environmental Protection Agency.[12]

Refiners have dramatically changed fuel formulations across the country and continue to enable significant reductions in vehicle tailpipe emissions. Gasoline produced today has reduced levels of sulfur, toxics and summer vapor pressure, improving air quality. Further reductions in sulfur will continue to build on these improvements in 2020 and beyond as Tier 3 fuels and vehicles are phased in and the vehicle fleet turns over. Ultra-low sulfur diesel fuel has 99.7 percent less sulfur – and is now produced for all highway and non-road uses, allowing for dramatically reduced nitrogen oxide emissions in newer diesel engines.

The progress we've made is undeniable; national average peak ozone concentrations have dropped by 17 percent since 2000.[13]

The U.S. oil and natural gas industry is spending billions of dollars developing new advanced energy technologies to reduce greenhouse gas emissions and meet future energy needs. Between 2000 and 2014, the oil and natural gas industry directly invested approximately $90 billion in zero- and low-emissions technologies. This represents about 30 percent of the more than $303 billion spent by all U.S. industries and the federal government combined.[14]

These large investments are critical to provide the low-carbon energy we will need in the years ahead. Domestic U.S. oil and natural gas companies are pioneers in developing alternatives and expanding America's use of virtually every form of energy – from geothermal to wind, from solar to biofuels, from hydrogen power to the lithium ion battery for next-generation cars.



Emissions Reductions

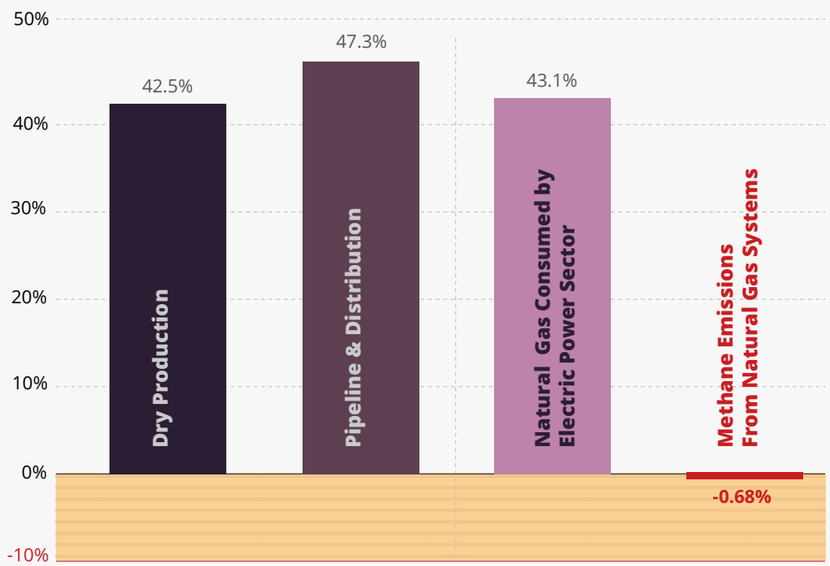
The benefits of abundant American energy extend beyond a family's budget or a business' bottom line.

The plentiful supply of domestically produced natural gas has also reduced our nation's greenhouse gas emissions and criteria air pollutant emissions chiefly from electricity generation.

President Trump, members of Congress and state and local elected leaders will decide whether our nation's energy revolution continues for decades to come. Unlike their predecessors of just a few years ago, they will inherit a country that leads the world in energy production with a growing population, an expanding economy and a cleaner environment, thanks to natural gas and its impact on declining emissions of criteria air pollutants. The natural gas industry has supplied the growth in natural gas use that fueled the expanding economy and made these emissions reductions possible, all while reducing its own emissions.

Methane Emissions Falling While Production Rises

U.S. Natural Gas 2005 to 2014
Source: http://cdn.api.org/test/zee-updates/dist/#/?section=chart-usNaturalGas



ENERGY BRIEF

OZONE STANDARDS

In 2015, the EPA promulgated the strictest ozone standards ever, which are expected to have, at best, negligible health benefits, but could impose significant costs on consumers and the economy.

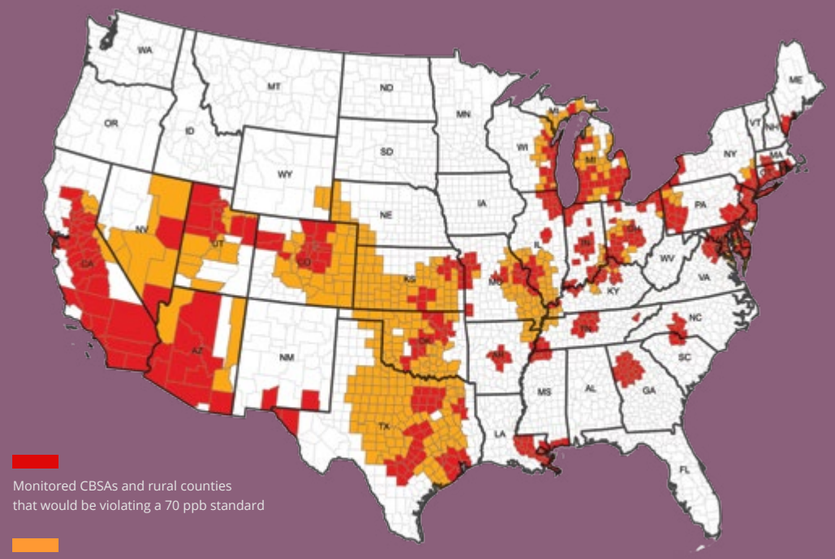
Additional time to implement these standards is imperative to avoid the most significant impacts on consumers and our economy. Without additional time, these standards are so severe that even pristine areas with little or no industrial activity, such as national parks, would fail to meet the standards. The unintended consequence is that communities could find it more difficult, if not impossible, to improve aging infrastructure. Local businesses would be unable to expand, constraining job creation and economic growth, all with little benefit to public health.

The EPA's 2015 rulemaking, which set the new ozone standards at 70 parts per billion, could quadruple the number of counties defined as being in non-attainment to 958. This has the potential to effectively shut down most new economic activity. Businesses of all sizes could be forced to navigate additional layers of bureaucracy and red tape to satisfy additional permitting requirements.

The new administration and Congress should take note of the progress made by the market and continue to build, not hinder, the development of our nation's enormous supply of oil and natural gas resources, rather than pursue policies that either restrict production or add unnecessary regulatory regimes that limit the use of hydraulic fracturing and horizontal drilling.

Projected Eight-Hour Ozone Non-attainment Areas

Based on a three-year period, 2012–2014
Source: United Research Services, August 3, 2015.



Monitored CBSAs and rural counties that would be violating a 70 ppb standard

Unmonitored areas that are anticipated to violate a 70 ppb standard based on spatial interpolation

America's energy revolution has disproved the long-held assumption that increased energy production creates higher emissions.

The fact is that even while production has significantly increased, total criteria air pollutants and greenhouse gas emissions have fallen, in large part due to expanded use of abundant, affordable natural gas in electricity generation.

Between 2000 and 2014, the oil and natural gas industry directly invested approximately $90 billion in zero- and low-emissions technologies. Many of these investments are in technologies that reduce leaks, capture emissions and improve energy efficiency. As a result, our nation's environment continues to improve. In fact, the United States is already one-third of the way to the emissions reductions target sought by the Paris Climate agreement. Under the Paris agreement, the United States is expected to cut its carbon emission levels between 26 percent and 28 percent below 2005 levels by 2025. According to the EPA's 2016 Inventory of Greenhouse Gases and Sinks: 1990-2014, U.S. carbon emissions were 9 percent below 2005 levels, even as the U.S. economy continued to grow.

Further, an Independent System Operator New England study illustrates how the increased use of natural gas in power generation, transportation and other areas is reducing emissions. According to the study, regional emissions dropped 65 percent for nitrogen oxide, 92 percent for sulfur dioxide and 35 percent for carbon dioxide between 2005 and 2014.

"The decline in emissions during this period reflects shifts in the regional fuel mix," the report states, "with increasing natural gas generation offsetting decreases in coal-and oil-fired generation."

The plentiful, affordable and dependable supply of U.S. natural gas, coupled with the fuel's environmental advantages, makes it a logical alternative, because it achieves what were once thought to be mutually exclusive goals: providing more energy with a smaller impact on our environment.

To date, CO_2 emissions from power generation, the largest source of greenhouse gas emissions in the U.S., have fallen 17 percent since 2000.[15] Even without an emissions reduction requirement in place, API modeling projects natural gas will continue to drive emissions reductions in the power sector, due to fuel switching.

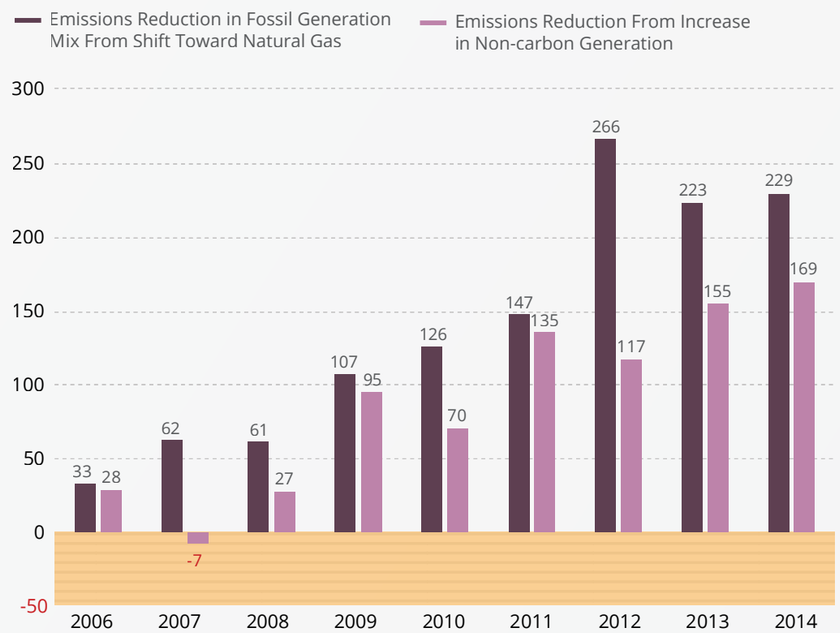
CO_2 emissions from power generation are projected to decrease by as much as 30 percent from 2005 levels by 2030, based on the continued increased use of natural gas for power generation.[16]

The oil and natural gas industry is also focused on how to meet national and global energy needs as efficiently as possible. A long-standing example is the use of excess heat from normal operations to convert steam to electricity in order to power a cogeneration plant. This has the ability to lower not only greenhouse gas emissions but also water use, because water requirements for cogeneration are often less than those for the same power generated by coal-fired boilers or steam-condensing turbines. For example, a 525 megawatt cogeneration unit at a refinery might require 6 million gallons per day (MGD) of water intake, while a similar 525 megawatt coal-fired boiler could use more than 14 MGD.[17] Using half the water to create the same amount of electricity is a valuable savings for the environment, the consumer and the refinery.

Electric Power Sector CO_2 Reduction

Million Metric Tons of CO_2

Source: EIA.



INDUSTRY LEADERSHIP THROUGH RESPONSIBLE DEVELOPMENT

Safety Standards

Safety is the No. 1 priority for the petroleum and natural gas industry.

For almost a century, the industry has advanced workforce safety and operational efficiency primarily through the American Petroleum Institute's standard-setting program. As part of API's Global Industry Services (GIS), API now maintains almost 700 standards covering all segments of the petroleum and natural gas industry. API standards also add to the ever-growing body of knowledge of industry best practices and lessons learned, which continues to deliver significant improvements in system integrity, reliability and integrated safety.

API's standards are referenced in federal regulations because they are recognized to represent industry best practices based on today's best available science and research. For example, the Bureau of Safety and Environmental Enforcement (BSEE) references 95 API standards in its offshore regulations. Overall, more than 130 API standards are referenced in more than 430 citations by government agencies, including the Coast Guard, the Environmental Protection Agency, the Federal Trade Commission, the Department of Transportation's Pipeline and Hazardous Materials Safety Administration and the Occupational Safety and Health Administration, as well as BSEE. Additionally, API's standards are the most widely referenced petroleum industry standards used by state regulators, with over 240 API standards cited over 4,130 times in state regulations.

These standards are developed in an open, third-party accredited process with subject matter experts from a wide range of disciplines, including academia, government regulators and industry experts, who all come together with one goal: to improve and advance the safety of energy development. This decades-long, demonstrated commitment to safety is at the heart of the industry's credibility and ability to safely deliver the energy our nation and the world need from some of the harshest and most unforgiving environments on the planet.

On the production side, high-quality industry standards promote safe and proven engineering practices both onshore and offshore in the design, fabrication, installation and operation of materials and equipment. These standards also improve safety and environmental performance, help reduce engineering costs and improve equipment interchangeability and product quality.

Industry's commitment to improving the safety of offshore operations goes beyond setting globally accepted standards. To accelerate the creation and implementation of best practices that reduce risk and improve the safety of offshore operations, the industry established the Center for Offshore Safety. It has become the focal point for safe offshore energy development, through ongoing collaboration between all stakeholders.

The fundamental mission of the Center for Offshore Safety is to promote continuous improvement in offshore drilling, completions and operations through effective leadership, collaboration, communication, teamwork, disciplined management systems, independent third-party auditing and certification, with a focus on company safety and environmental management systems.

The center is a clear demonstration of the oil and natural gas industry's commitment to safe operations and understanding that when it comes to safety, there is no room for second best.

ENERGY BRIEF

API PUBLICATION 1509 PROTECTING CONSUMERS

API standards help protect the American consumer. API Publication 1509, the "Engine Oil Licensing and Certification System," sets the performance standards for passenger vehicle engine oil and includes rigorous testing and quality requirements. This API standard is referenced by every major U.S. auto manufacturer as acceptable for use in their engines.

API conducts a voluntary certification program of engine oils that licenses approved oils to bear the API "seal of approval." Consumers know that if a product bears the API seal of approval, then that product has been rigorously tested to meet their needs.

ENERGY SECURITY
Reliable Power

Market forces, federal and state legislatures, and environmental policy are driving the ongoing shift in our nation's power generation mix.

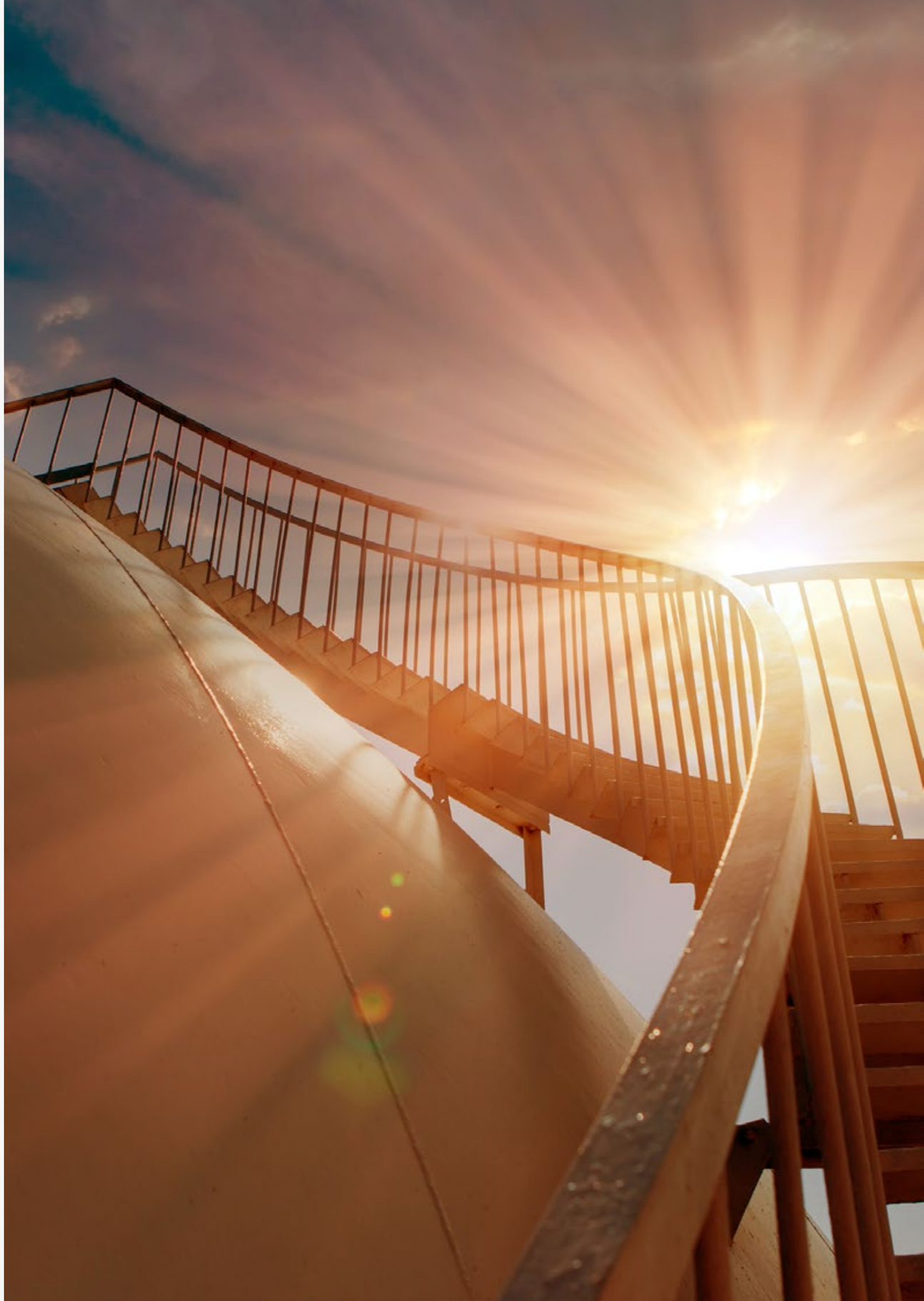
Natural gas use in the electricity market has grown by 86 percent since 2000,[18] driven by these forces. Administrators of regional electricity markets and balancing authorities are charged with ensuring that our nation's electricity grid is reliable. Environmental and electricity policy must coexist in the states, where regulators are also charged with protecting consumers. States are interested in providing consumers with a generation mix that is clean, reliable and affordable, and natural gas plays a critical role in meeting all three goals.

Natural gas generation is capable of providing on-demand "dispatchable" power, ramping up quickly and following real-time changes in electrical load. This means natural gas generation can replace traditional coal and nuclear power that are no longer economic, as well as support intermittent renewable power. Natural gas generation keeps the power on and grid stable when the sun doesn't shine and the wind doesn't blow.

To sustain a clean, reliable and affordable power supply, federal, regional and state regulators need to recognize that a market-driven diversity of attributes, not an arbitrary, government-mandated fuel mix, will lead to the lowest cost and most reliable power for consumers. It is a matter of fact that within our borders, our nation has enormous energy resources.

What is in question is whether the oil and natural gas industry will be given access and the opportunity to develop those resources to meet our nation's and the world's energy needs. Today, there remains a stark difference between energy development trends on federal land compared to those on private and state land.

Between 2010 and 2015, the percentage of the nation's crude oil produced on federal land decreased from 35.7 percent to 21.0 percent.[19] And according to the Bureau of Land Management, the number of drilling permits issued on federally controlled onshore land dropped by 47 percent from 2008 to 2015.[20] Further, federal data show crude oil production remained flat between 2010 and 2015 on federally controlled land, while natural gas production declined 27 percent.[21] In contrast, on private and state lands, where drilling typically does not require federal approval, production increased 115 percent for crude and 66 percent for natural gas from 2008 to 2015.[22] The stark difference between production on federal land and state and private land is not just due to ineffective and inefficient national energy policy; it's also bad federal fiscal policy. If production on federal lands had grown at the same rate as overall U.S. production, from 2009 through 2015, total royalties would have been 31 percent higher, with an additional $20 billion in royalties collected by the federal government.[23] If our nation is to continue to be a world leader in energy production, that difference has to decrease, if not disappear.



CASE STUDY
ALASKA'S RESTRICTED ACCESS TO ENERGY RESOURCES

Alaska's North Slope accounted for 25 percent of U.S. domestic oil and natural gas production in 1988, but production has plummeted because the U.S. government has largely prevented exploration for new resources in the state, both onshore and offshore. Total North Slope production fell to approximately 465,000 barrels per day in 2015, a 76 percent decrease from 1988.[i]

The U.S. Geological Survey (USGS) estimates that the National Petroleum Reserve – Alaska, which encompasses about 23 million acres and is the largest single block of federally managed land in the U.S., holds 896 million barrels of oil and 53 trillion cubic feet of natural gas.[ii] In 1923, the reserve was set aside as an emergency oil supply for the U.S. Navy and today is open to "oil and gas leasing, exploration and operations."

In 2013, the federal government announced roughly half of the reserve would be put off-limits to oil and gas development, and to date no commercial drilling for oil and natural gas has occurred. In 1980, Area 1002 was set aside for oil and natural gas production within the Arctic National Wildlife Refuge.

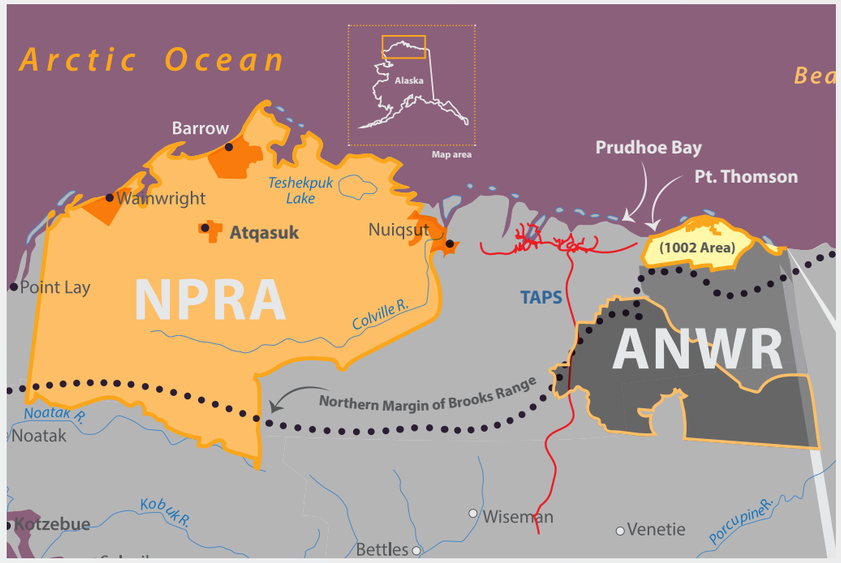
Today energy development in Area 1002, as in much of the Arctic, remains prohibited by restrictive federal policies, which puts at risk our nation's long-term energy security and ability to meet the nation and the world's energy needs. [iii]

Restricting this nation's access to the energy resources in the Arctic, at a time when other nations are actively exploring the region, could inhibit our access to important energy resources in the future.

Arctic | Energy Security

Barriers to Development

Source: National Petroleum Reserve in Alaska, https://www.blm.gov/ak/st/en/prog/energy/oil_gas/npra.html



[i] EIA, Alaska Crude Oil Production, https://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbblpd_a.htm
[ii] USGS, Economic Analysis of the 2010 U.S. Geological Survey Assessment of Undiscovered Oil and Gas in the National Petroleum Reserve in Alaska, http://pubs.usgs.gov/of/2011/1103/ofr2011-1103.pdf
[iii] USGS, Arctic National Wildlife Refuge, 1002 Area, Petroleum Assessment, 1998, Including Economic Analysis, https://pubs.usgs.gov/fs/fs-0028-01/fs-0028-01.htm

Infrastructure

American consumers' growing energy appetite means greater demands on our nation's energy infrastructure, including pipelines, railroads, highways, waterways and ports.

A robust infrastructure system that is safe, efficient and properly maintained can help lower the costs of supplying oil and gas and its products for consumers, by reducing congestion, maximizing efficiency and preventing accidents.

The country's energy infrastructure system was originally built to move oil and gas from the coasts, where it was delivered by ship, to the refining centers and populations inland. Today, the U.S. energy renaissance is driven by the enormous amount of energy resources found in inland formations, including the Eagle Ford and Barnett in Texas, the Woodford in Oklahoma, the Bakken in North Dakota and Marcellus under the states of Pennsylvania, New York, Ohio, Maryland and West Virginia. To reach America's full energy potential, we need to maintain our existing infrastructure and invest in new infrastructure that will move U.S. resources from these inland formations to refineries and, ultimately, consumers.

Pipelines are a modern, safe and efficient way to move oil and natural gas from where it is produced to where it is refined and processed to where it is used. In 2014, 500,000 miles of liquid and natural gas transmission pipelines transported 16.2 billion barrels of crude oil and petroleum products and 27.3 trillion[24] cubic feet of natural gas throughout the country at a safety rate of 99.99 percent.[25] The U.S. will need more pipelines to keep pace with growing production and consumer demand. The current lack of energy infrastructure negatively affects consumers. For example, because of infrastructure bottlenecks in the Northeast, New England's household energy prices are among the highest in the nation – with all six states ranking in the top 10 for highest costs of energy.[26] In 2015, New England families paid on average 53 percent more for their electricity than the rest of the nation. Specifically, with the exception of Maine and Pennsylvania, consumers in the Northeast in 2015 have paid between 30 percent to 70 percent more for their energy than the national average.[27]

Since 2010, transportation of crude oil by rail in North America has grown significantly from 23.8 million barrels to 318.8 million barrels in 2015. In 2015, railroads transported approximately 8 percent of U.S. oil production, with a safety record of 99.99 percent.[28]

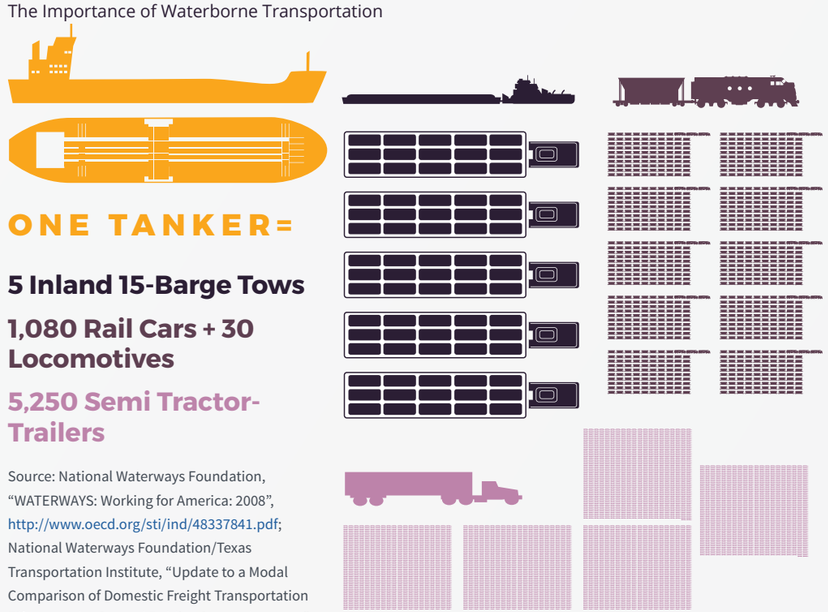
The global trade of oil and natural gas is dependent on our nation's ports and waterways to move crude oil to our nation's refineries, export refined products and natural gas to markets abroad and move products domestically on our vast inland waterway system. These waterways are still the backbone of the freight network, carrying the equivalent of about 51 million truck trips of goods each year.[29] These marine highways are a crucial way to carry large amounts of cargo, including oil and natural gas, which would otherwise travel by longer and more costly means. As impressive as our nation's energy infrastructure is, it is in need of expansion to keep pace with a growing population, demand for goods and services and energy needs. Investing in our nation's infrastructure will not only allow the oil and natural gas industry to keep pace with energy demand, it will also help keep energy affordable for the consumer, while creating well-paying jobs, giving U.S. manufacturers a competitive advantage through lower energy and raw material costs and providing revenue to local, state and federal governments.

The private sector is responding by investing millions in our nation's energy infrastructure. Between 2010 and 2013, capital spending in the infrastructure that moves and transforms oil and gas into everyday products has increased by 60 percent.[30] IHS estimates that investments in building, maintaining and updating the oil and natural gas industry's transportation and storage infrastructure could contribute, on average, $120 billion to the economy per year.[31]

Increased capital investment in energy infrastructure will also lead to more revenue and output among supplier industries, such as steel, machinery and engineering services. This capital investment, in turn, could trigger an estimated $45 billion per year throughout the extended supply chain.[32] To sustain our nation's positive energy trajectory and position as a global energy leader, the new administration and Congress should work with the private sector to enable the expansion of our nation's energy infrastructure through consistent regulation and efficient processes.

The Benefits of Marine Transportation

The Importance of Waterborne Transportation



Source: National Waterways Foundation, "WATERWAYS: Working for America: 2008", http://www.oecd.org/sti/ind/48337841.pdf; National Waterways Foundation/Texas Transportation Institute, "Update to a Modal Comparison of Domestic Freight Transportation Effects on the General Public - September 2011"

ENERGY TOMORROW

... IS ESSENTIAL.

Few anticipated America's rapid rise as a world energy leader. During the past decade, American crude oil production jumped 88 percent and natural gas production increased 46 percent,[1] catapulting the United States to our current position as the world's leading oil and natural gas producer. It's paying off for consumers.

In 2015, drivers saved an average of over $550 in gasoline costs.[2] Additionally, households saved $1,337 through lower home energy costs and lower costs for other goods and services.[3] And it's paying off for American manufacturers, whose electricity costs are 30-50 percent lower than those of foreign competitors.[4] We also lead the world in reduction of carbon emissions, which are near 20-year lows due to the increased use of clean-burning natural gas.[5]

We may not have seen the American energy revolution coming, but we know how to sustain it.

The U.S. model provides a blueprint for future energy policy, demonstrating that market-based solutions are the most effective path for achieving success in both energy production and our environmental goals, all while generating economic growth and delivering significant savings that provide relief to household budgets and competitive advantages to businesses.

GROWING OUR ECONOMY

Hydraulic Fracturing: The Engine of America's Energy Resurgence

U.S. Department of Energy statistics show "up to 95 percent of new wells drilled today are hydraulically fractured, accounting for more than 43 percent of total U.S. oil production and 67 percent of natural gas production."[6]

In other words, the American energy renaissance, and millions of jobs and numerous economic benefits it has made possible, would not have happened if not for technological advances in hydraulic fracturing and horizontal drilling that have unlocked previously inaccessible resources in shale formations.

Hydraulic fracturing, in combination with horizontal drilling, has made the United States the world's leading producer of oil and natural gas, while generating significant job growth.

A 2013 IHS study found that energy from shale and other tight-rock formations supported 2.1 million jobs in 2012, and that number was projected to increase to 3.9 million jobs by 2025, including 500,000 manufacturing jobs.[7] By helping to lower power and materials costs, as well as stimulating economic activity for a variety of businesses like service and supply companies, hydraulic fracturing has supported economic growth in an otherwise struggling economy. What's more, hydraulic fracturing is a primary factor in emissions reduction achievements.

The EIA cites "increased use of natural gas for electricity generation" as the primary reason carbon emissions have dropped.[8]

Preliminary findings from a landmark EPA study released in June 2015 confirm that the technology is safe.[9] The five-year, $31 million study of hydraulic fracturing "did not find evidence that these mechanisms have led to widespread, systemic impacts on drinking water resources in the United States." The EPA's exhaustive study is the most complete compilation to date of scientific data on the issue, including more than 950 sources of information, published papers, technical analysis, contributions from stakeholders and peer-reviewed EPA scientific reports. Revisions released in December 2016 do not change the fact that the science and data demonstrate that hydraulic fracturing is safe.

The EPA study is just one of many during the course of the technology's 65-year history to affirm the effectiveness of industry standards and strong state regulations in keeping hydraulic fracturing operations safe for the environment. In February 2016, the University of Cincinnati completed a three-year study in which researchers examined water samples three to

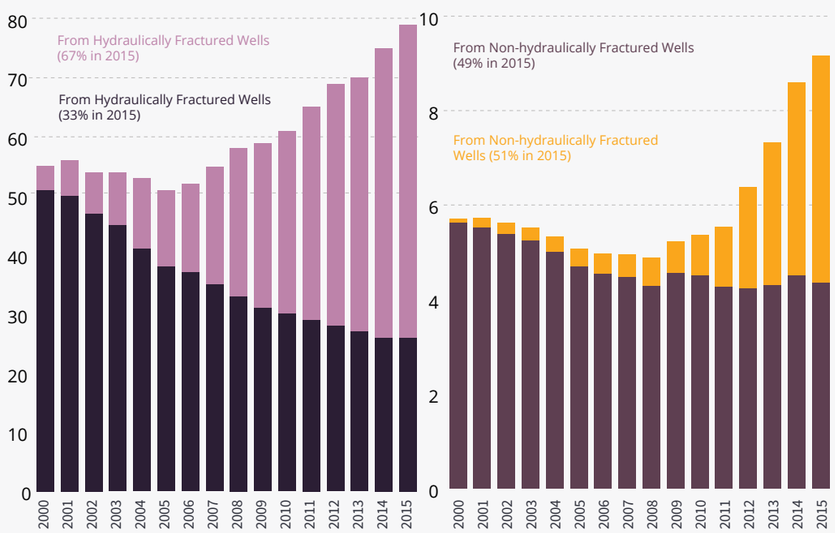
four times per year from 23 wells in the Utica shale region. The study found no evidence linking fracking to groundwater contamination.[10]

The current regulatory approach – a combination of federal oversight through multiple regulatory agencies, plus strong state regulations tailored to local geology and hydrology – is effective for keeping hydraulic fracturing safe and successful.

A 2014 report from the Groundwater Protection Council documented "continuous and significant regulatory improvement by state oil and gas agencies across the county" and concluded "the risk of fracture fluid intrusion into groundwater from the hydraulic fracturing of deeper conventional and unconventional oil and gas zones can be considered very low."[11] As the driving force behind the American energy renaissance,[12] hydraulic fracturing has helped lower fuel, utility and manufacturing costs while also contributing to reduced greenhouse gas emissions through an abundance of affordable, clean-burning natural gas.[13] The optimal policy approach to this integral technology is one that recognizes the emissions reductions that industry has and will continue to achieve, recognizes the effectiveness of state regulations, accepts the scientific evidence and avoids additional regulations that could discourage production while providing little or no additional environmental or safety benefits.

U.S. Marketed Natural Gas Production Billion Cubic Feet Per Day

Source: EIA, Marketed Natural Gas Production, http://www.eia.gov/todayinenergy/detail.php?id=26112#



Oil Production in the U.S. (2000-2015) Million Barrels Per Day

Source: EIA, Oil Production, http://www.eia.gov/todayinenergy/detail.php?id=25372

ENERGY BRIEF

GOOD STANDARDS MAKE GOOD NEIGHBORS

Thanks to technological advances in hydraulic fracturing and horizontal drilling that have unlocked previously inaccessible energy resources, more and more communities are taking part in America's ongoing energy revolution – and the new jobs and economic growth it brings.

To facilitate community engagement in oil and natural gas development areas, API developed a first-of-its-kind "good neighbor" industry standard, which includes recommendations to:

- Help local leaders and residents prepare for energy exploration
- Minimize interruption to the community
- Conduct public meetings on safety
- Work with local educational institutions to discuss training for new job opportunities
- Develop relationships with mineral owners
- Enhance the long-term benefits of local development
- Ensure that oil and gas production is done in a way that complements community goals

THE NATURAL GAS SOLUTION

Emissions reductions, reliability and affordability – the shale revolution is delivering major benefits to the power generation sector, and all signs point to continued advantages. U.S. natural gas production over the past three years has exceeded even the high-end resource projections from the U.S. Energy Information Administration.[i]

Market-driven natural gas generation growth is projected to continue, and emissions per megawatt of total electricity generation are projected to decline. Continued increases in reserve estimates and industry technological advances since 2010 make clear that natural gas will remain an affordable, environmentally friendly option for the nation's power plants.

In fact, API's analysis of the potential impacts of the EPA's Clean Power Plan on cost, generation and capacity found that the lowest cost compliance pathway was always the solution that relied upon the most natural gas generation.[ii] Policy choices that promote market solutions over government mandates will allow continued growth in natural gas generation, providing a solution for regulators responsible for ensuring a clean, reliable, affordable generation mix.

[i] Department of Energy/EIA, "Annual Energy Outlook 2016, "August 2016, http://www.eia.gov/forecasts/aeo/pdf/0383(2016).pdf
[ii] API (Using ICF's Integrated Planning Model), "The Natural Gas Solution: API's Modeling of EPA CPP," October 2016, http://www.api.org/~/media/Files/Policy/Natural-Gas-Solutions/API-Modeling-of-EPA-CPP.pdf

CASE STUDY
BUILDING THE WORKFORCE OF THE FUTURE

Although the global market conditions are challenging, keeping pace with American energy needs will require a substantial increase in the workforce long term – in part due to demographic trends. The U.S. Census Bureau projects one in five Americans will be age 65 or over by 2030.[14] In the oil and natural gas industry, that means the next two decades will bring us closer to the "Great Crew Change" we've been anticipating for years, when up to 50 percent of the industry's most experienced workers are expected to retire.[15]

A report from consulting firm IHS projects 1.9 million new oil, natural gas and petrochemical job opportunities by 2035, including 707,000 positions projected to be held by African American and Hispanic workers, and 290,000 jobs filled by women.[16]

Among the projected 1.9 million new job opportunities, 57 percent are projected to be in blue-collar occupations, indicating great opportunity for workers with high school diplomas and some post-secondary training. According to the U.S. Census Bureau, only 40 percent of working-age Americans have at least a two-year degree, making Americans without college education the majority. The oil and natural gas industry is a bright spot for these workers. In fact, IHS projects more than 1 million job opportunities in the industry – in occupations such as construction workers, truck drivers, welders, electricians and mechanics – providing individuals without formal college education the opportunity for meaningful and well-paying careers.

Another 32 percent of job opportunities in the industry are projected to be in management and professional fields. In addition to the engineers and geoscientists most people picture when they think of the energy industry, attorneys, business leaders, architects, communications specialists and health and safety experts are also in demand.

The industry is partnering with schools, labor organizations and the government to increase awareness of energy job opportunities and to promote greater participation in science, technology, engineering and math (STEM) subjects. We're working with Hispanics in Energy and the American Association of Blacks in Energy to spread the word about the IHS report's findings that 707,000 positions are projected to be held by African American and Hispanic workers. And we've started a Veterans Energy Pipeline program to connect veterans with career opportunities compatible with their unique skill sets.

With above-average salaries and an abundance of career opportunities projected over the next two decades, the oil and natural gas industry offers solutions to wage stagnation and income inequality, which remain major concerns in our still-struggling economy. Capitalizing on energy job opportunities doesn't require a government program or taxpayer funding. All it takes are smart energy policies and increased awareness of job opportunities to ensure the "Great Crew Change" is the game changer it can be for America's workers.

Energy Exports: Expanding U.S. Global Energy Leadership

As the world's leading producer of oil and natural gas, the United States has a valuable opportunity to expand our economy and geopolitical influence by exporting a portion of our abundant oil and natural gas resources.

Allies seek U.S. energy as a reliable alternative to energy supplies from less stable regions, and expanded access to additional international markets promises positive impacts on economic growth, job creation and the trade balance.

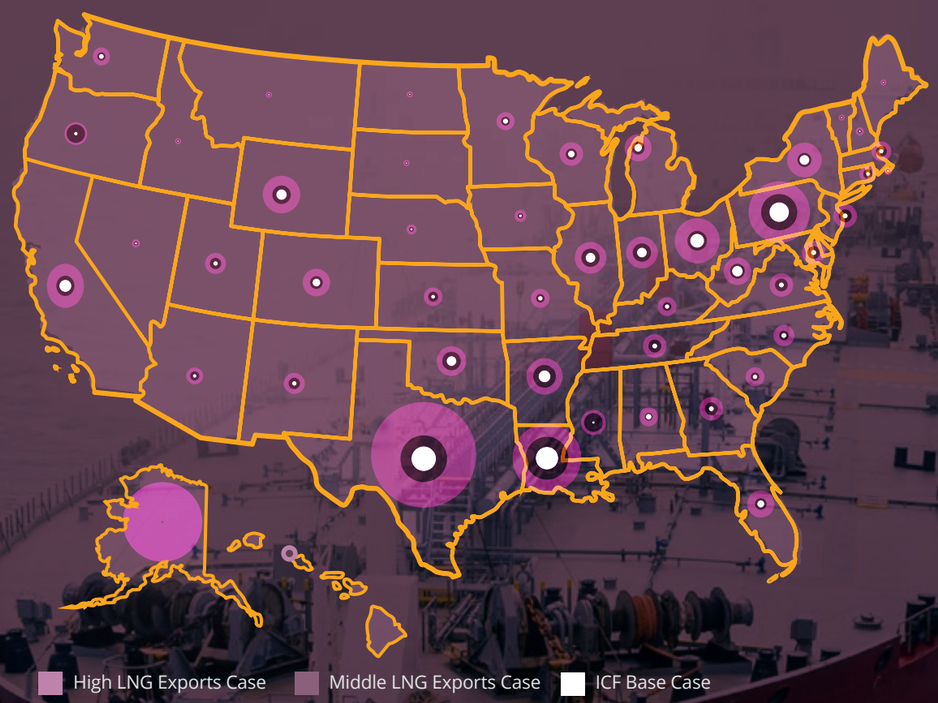
The lifting of the crude export ban in December 2015 paved the way for new opportunities for U.S. producers – and demonstrated the positive outcomes possible when policymakers come together to advance bipartisan, commonsense energy policies. A relic of '70s-era energy scarcity, the ban was rendered obsolete by the American energy revolution, and studies show that maintaining it would have meant missing out on significant economic benefits – an estimated 300,000 American jobs and $5.8 billion per year in consumer savings by 2020 in gasoline, heating oil and diesel costs, according to ICF International.[17]

In 2014, the number of nations buying American crude oil was eight. In 2016, after export restrictions were lifted, that number rose to 22.[18] U.S. crude has shipped to the United Kingdom, France, Germany, Italy, Switzerland, the Netherlands, Israel, China and Panama – further diversifying global supply options, boosting the U.S. economy through increased trade activity with Europe and providing an outlet for U.S. producers. Further, the fuel cost increases predicted by those who opposed lifting the ban did not materialize.

Last year also saw a milestone for exports of liquefied natural gas (LNG) as the first cargo carrying U.S. LNG left port in February,[19] bound for Europe.[20] Another landmark development occurred in July, when the first U.S. LNG shipment passed through the newly expanded Panama Canal. The canal expansion is a major enhancement for U.S. competitiveness, reducing transit time from Gulf Coast export terminals to Japan to 20 days, compared to the previous 31 to 34 days (moving either through the Suez Canal or around the southern tip of Africa, respectively) and also reducing travel time from the Gulf Coast to potential South American LNG markets.[21]

Map of 2035 Relative Income Impacts from LNG Exports (By State Income)

Source: ICF estimates.



ENERGY EXPORTS ENHANCE NATIONAL SECURITY

"When more supply originates from producers who are not vulnerable to political instability, conflict or threats to their energy infrastructure, the overall market becomes more stable. ... [A]llowing U.S. oil exports would enhance the energy security of key U.S. partners, from Poland to India, to Japan. Indeed, our closest allies in Europe and Northeast Asia would welcome – and have asked for – the unrestricted export of U.S. crude oil ... Enabling U.S. oil exports would strengthen our geopolitical influence, leadership and leverage with allies and adversaries alike."

Michele Flournoy
Former Undersecretary of Defense
Obama Administration[22]

After a decade that saw U.S. natural gas production jump 50 percent,[23] the advent of natural gas exports to strategic allies represents a significant expansion of U.S. global energy leadership.

The United States is projected to become the world's third-largest LNG supplier in five years, behind Qatar and Australia, according to an International Energy Agency (IEA) report.[24] LNG exports could contribute up to 452,000 jobs nationwide between 2016 and 2035 and add up to $73.6 billion annually to the GDP, according to an ICF International study.[25]

Just as greater use of natural gas for U.S. electricity generation[26] has reduced our carbon emissions to levels not seen in more than two decades,[27] U.S. natural gas can bring emissions reduction progress to other nations.

A 2014 Department of Energy study found that exporting U.S. LNG will reduce global greenhouse gas emissions, because U.S. natural gas consumed in Europe or Asia has lower life-cycle GHG emissions than power generation from locally sourced fossil fuels.[28] Greater natural gas production and use also lowers emissions of other air pollutants, such as mercury, sulfur dioxide, nitrogen oxide and particulate matter.

U.S.-produced natural gas can provide the same security advantages as those associated with crude oil exports. Access to U.S. LNG is a key aspect of renewed European Union efforts to improve energy security for European nations that "are still far too vulnerable" to supply disruptions, according to EU officials.[29]

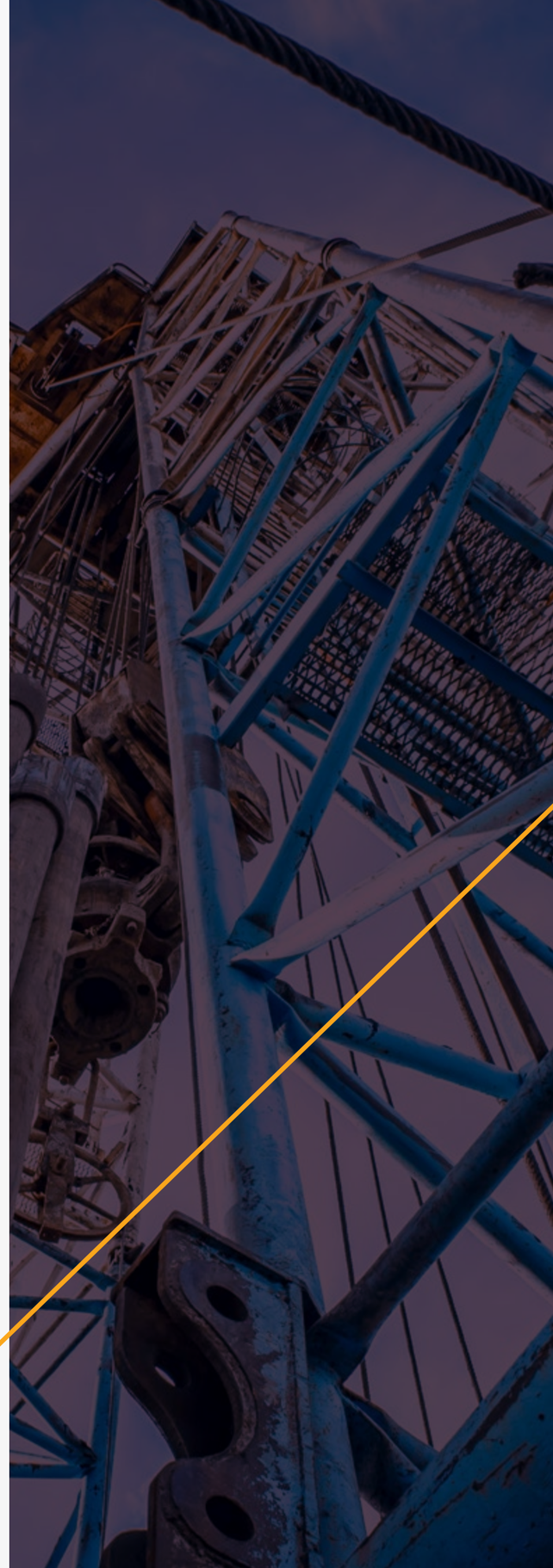
"Like shale gas was a game changer in the U.S., American gas exports could be a game changer for Europe," said Maros Sefcovic, who heads the EU's "Energy Union" project team.

The mayor of a Lithuanian town that just opened a natural gas import terminal to break reliance on Russian natural gas explained the geopolitical implications succinctly, commenting:

"U.S. LNG is more than just about gas. It's about freedom."[30]

Our ability to expand the economic and strategic benefits of our position as the world's leading natural gas producer is tied to our ability to expeditiously approve exports. In addition to the extensive environmental review process required for the largest LNG export facilities, exports to non-Free Trade Agreement nations require an additional approval from the Department of Energy that has proved to be a lengthy, sometimes unpredictable, process. As of December 2016, more than 20 U.S. facilities still awaited approval, and more than half of those applications were sent to the Department of Energy in 2014 or earlier.[31] Meanwhile, dozens of LNG export projects are currently planned or under construction in other nations.

The international competition to meet global LNG demand is well underway, and streamlining the approval process is critical to U.S. ability to capitalize on our production advantages. 2016 was a breakthrough year for expanding U.S. energy leadership through exports of crude oil and natural gas. Through policies that remove export delays and barriers, we can build on that progress and ensure that the economic, geopolitical and security benefits from U.S. exports reach their full potential.



Infrastructure Opportunities

America's game-changing production increases would not have the same positive impact on consumers' daily lives without infrastructure to deliver affordable, reliable energy to homes and businesses.

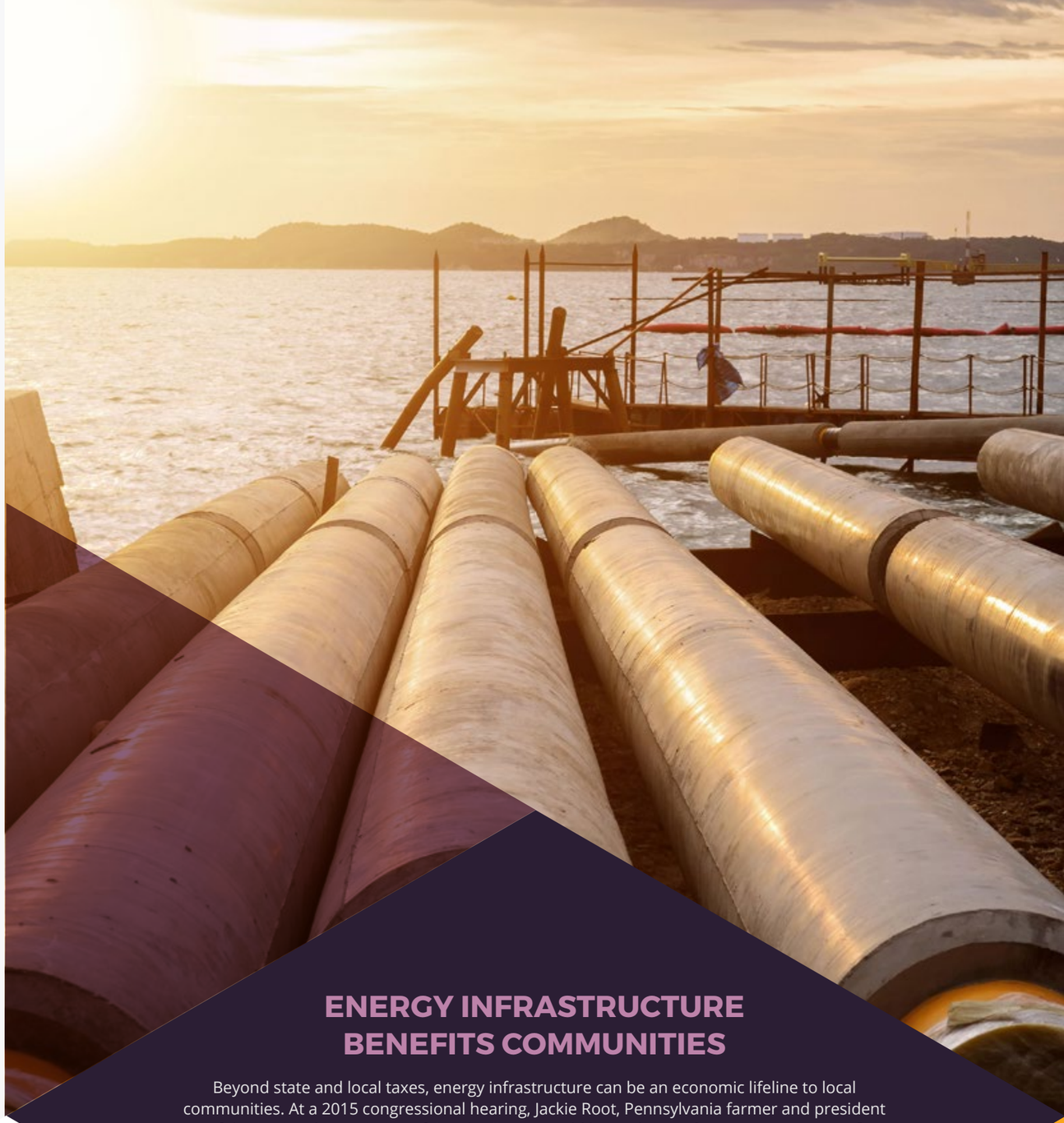
Energy infrastructure consisting of pipelines, storage, processing, rail and maritime resources is an often underappreciated component of the American energy revolution, yet it is essential to delivering its benefits to every state.

Over 500,000 miles of natural gas and petroleum products transmission pipelines cross the United States, and that capacity must be expanded to keep pace with 21st century production trends and to ensure that Americans from every state share in the benefits of affordable domestic energy. As the world's leading producer of oil and natural gas, U.S. energy infrastructure needs have changed. According to a study from Energy Policy Research Foundation Inc., shipments of crude oil from the Gulf of Mexico to the Midwest decreased 500,000 barrels per day (b/d) between 2008 and 2013, while shipments from the Midwest to the Gulf jumped from just 50,000 b/d to over 380,000 b/d.[32]

With production growth in areas like the Midwest and Pennsylvania, expanding our pipeline system will ensure that we move energy efficiently, maximizing the economic and environmental advantages of our status as a world energy leader.

Multiple studies illustrate the potential economic benefits. According to a report released by the University of Illinois at Urbana-Champaign, oil and natural gas projects related to the Marcellus shale region from 2008 through the first half of 2014 were responsible for more than 72 million man hours of direct and indirect labor construction. This translates into more than 40,000 construction jobs.[33] If energy infrastructure needs are adequately prioritized, those jobs are just the beginning. According to a study by IHS, updating America's energy infrastructure could generate up to $1.15 trillion in new private capital investment, support 1.1 million new jobs and add $120 billion, on average, per year to our nation's GDP between 2014 and 2025.[34]

Working with federal and state regulators, the oil and natural gas industry has processes in place to ensure that pipeline construction is safe. State and federal policies that facilitate transparent and timely project review, as well as set and maintain realistic deadlines for pipeline approval, will do much to expedite construction and expand infrastructure to enhance the delivery of affordable energy that consumers and businesses need.



ENERGY INFRASTRUCTURE BENEFITS COMMUNITIES

Beyond state and local taxes, energy infrastructure can be an economic lifeline to local communities. At a 2015 congressional hearing, Jackie Root, Pennsylvania farmer and president of the National Association of Royalty Owners, told lawmakers: **"The constant stress of fluctuating commodity prices and unpredictable weather is softened a bit with additional income from leasing, royalties and pipeline right-of-way. Over the long term, I believe natural gas development will actually preserve our precious open space; successful farmers will farm the land rather than subdivide it."**[35]

SECURING OUR ENERGY

There's no question; the American energy renaissance has delivered significant economic and environmental benefits – so significant that it can be easy to take our new energy reality for granted. With gas prices low and imports down, adding production capacity may not seem as urgent. But, just as today's energy security is the result of production set in motion years ago, now is the time to lay the groundwork for energy security in future decades.

Accessing Our Resources

World energy consumption will increase 48 percent by 2040, and 78 percent of energy needs will be met by fossil fuels, according to the latest projections from the EIA.[36]

The question is not whether the United States has the resources to maintain our position as a world energy leader, along with the myriad economic and security benefits that confers; it is whether we will implement policies to capitalize on our ample oil and natural gas supplies.

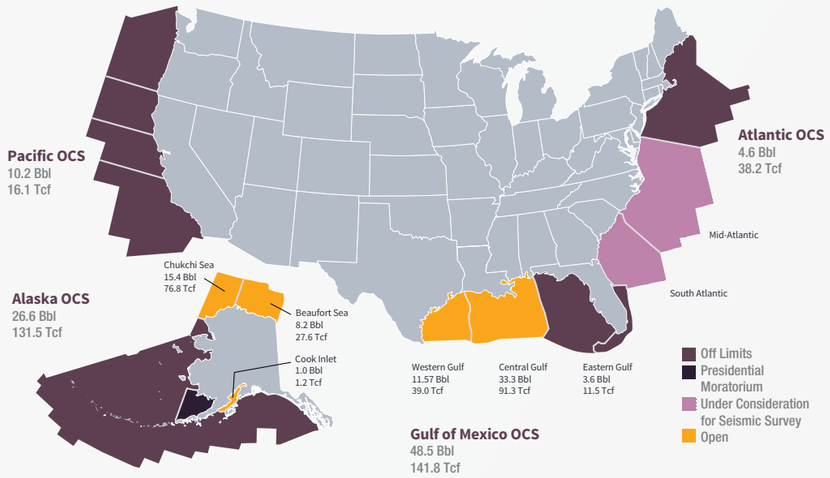
Government policy keeps 87 percent of federally controlled offshore acreage off-limits to energy development. Opening areas in the Atlantic, Pacific and Eastern Gulf of Mexico could lead to production of more than 3.5 million barrels of oil equivalent per day, according to research by Quest Offshore Resources.[37] The economic benefits associated with that level of production are significant. Between 2017 and 2035, expanded offshore production could create nearly 840,000 new American jobs, grow our economy by up to $70.2 billion per year and raise over $200 billion in cumulative revenue for the government.

Access to resources in the Arctic Ocean is just as critical. The Beaufort and Chukchi seas off the coast of Alaska contain more technically recoverable oil and natural gas than the Atlantic and Pacific coasts combined, according to government estimates.[38] Access to the world's largest remaining conventional, undiscovered oil and natural gas reserves – 13 percent of recoverable oil and 30 percent of recoverable natural gas resources – is at stake.[39]

Unlocking America's Offshore Energy Opportunity

(Billion Barrels — Bbl and Trillion Cubic Feet — Tcf)

Source: Bureau of Ocean Energy Management, "Assessment of Undiscovered Oil and Gas Resources of the Nation's Outer Continental Shelf, 2016", https://www.boem.gov/2016-national-assessment-fact-sheet/



87% of federal offshore acreage is off limits to development

U.S. MANUFACTURERS: ENERGY ACCESS CRITICAL TO AMERICAN COMPETITIVENESS

"For manufacturing to succeed, access to reliable and affordable energy is essential," states the National Association of Manufacturers, noting that "our oil and natural gas production has been a boon for manufacturing growth and productivity in recent years."[40]

The American Chemistry Council concurs, commenting, **"A supply strategy that includes OCS (Outer Continental Shelf) energy will support the manufacturing renaissance taking place in the United States."**[41]

Given the long lead time required to develop offshore projects, taking production opportunities off the table is shortsighted and jeopardizes our energy security for at least the next decade. As other nations pursue their own future energy security priorities in the Arctic, a U.S. presence means strict U.S. safety standards and best practices are also there.

Dedicated efforts to improve safety systems and capabilities ensure offshore development is safer than ever. Further, decades of experience operating in Arctic environments shows the oil and natural gas industry has the technology and expertise to safely develop Arctic offshore resources.

The ability to take full advantage of America's oil and natural gas resources hinges on periodically updated leasing plans developed by the Bureau of Ocean Energy Management (BOEM).

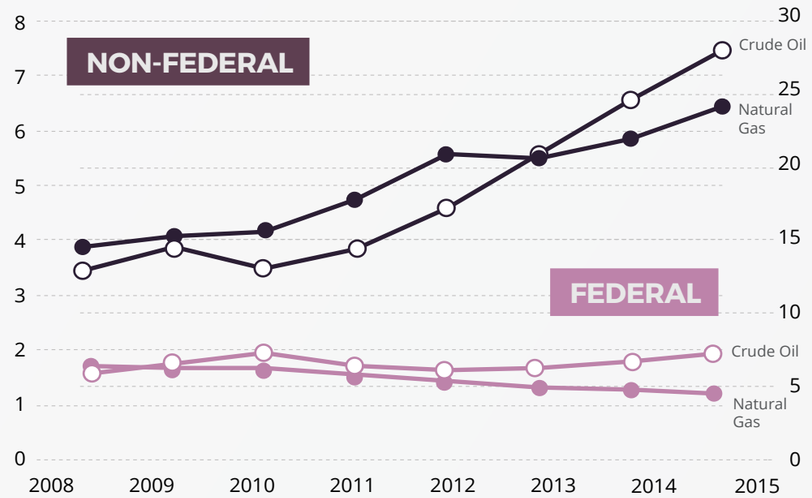
A draft plan for 2017-2022 announced in 2014 by BOEM would have opened the Atlantic to exploration. But in March 2016, the administration backtracked,[42] removing the Atlantic despite strong statewide public support for offshore development in North Carolina (64 percent), South Carolina (67 percent) and Virginia (65 percent).[43] The final plan announced in November 2016 dealt a further blow to future energy security, setting additional restrictions on Arctic exploration.

To maintain American energy leadership, build energy security for future decades and create jobs, expanding access onshore and offshore must be a top priority in the next Congress and presidential administration.

U.S. Oil and Natural Gas Production on Federal vs. Non-federal Lands and Waters

Million Barrels Per Day (Crude Oil) | Trillion Cubic Feet (Natural Gas)

Source: Congressional Research Service, U.S. Crude Oil and Natural Gas Production in Federal and Non-federal Areas, June 2016.



MILITARY LEADERS: ARCTIC ACCESS IS CRITICAL FOR SECURITY, GEOPOLITICAL PRIORITIES

Former Clinton administration Defense Department Secretary William Cohen, along with 14 other military experts, wrote the Department of Interior in 2016,[44] urging the Obama administration to maintain energy exploration options in the Arctic because removing them "would harm our ability to protect our interests and to promote cooperation in the region."

While Russia and China have significantly increased their presence and activity in the area, "Arctic capabilities of the U.S. have dramatically declined … [and] our reduced Arctic presence and capabilities challenges the U.S. ability to positively influence all developments in the region," the letter continued.

"Arctic offshore energy development will occur," the military leaders pointed out, "whether or not the U.S. participates, as other countries pursue the Arctic's large energy resources to meet long-term energy needs."

Pro-Growth Tax Policy

Tax policy can have just as much impact on energy security as access decisions can, and the relationship between taxes and energy production is a two-way street that can lead to either mutual benefit or mutual detriment.

On the positive side, pro-energy policies – including smart tax policy but also expanded access, infrastructure investment and export capability – can increase government revenue and jobs.[45] Shortsighted energy policies, like duplicative regulatory constraints and industry tax hikes, can reduce government revenue and job opportunities.

The oil and natural gas industry contributes about $70 million a day, on average, to the federal government in revenue from taxes, rents and royalties.[46] The government's interest in maintaining or increasing this revenue is best served not by increasing taxes but by increasing energy production, which in turn can serve the even more important purposes of economic and energy security growth.

An analysis by Wood Mackenzie found pro-development energy policies could grow government revenues by $111 billion. Shortsighted energy policies, like duplicative regulatory constraints, could reduce government revenue by $260 billion.

The U.S. oil and natural gas industry pays its fair share. From 2011 to 2015, oil and natural gas industry income tax expenses (as a share of net income before income taxes) averaged 38.5 percent, compared to 25.8 percent for other Standard & Poor's Industrial companies.[47] Rather than invest where the best tax regime can be found, oil and natural gas companies invest where the resource is located, continuing to spend billions of dollars on new and existing domestic projects each year despite U.S. tax rates that are the highest in the developed world.

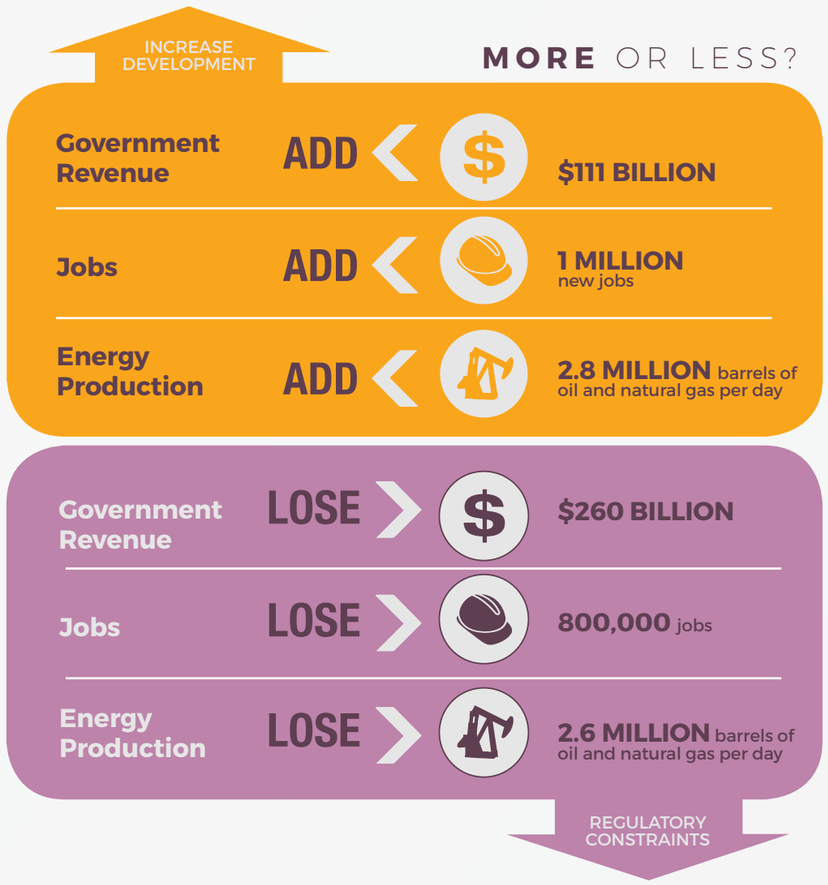
Maintaining tax policies like the deduction for intangible drilling costs is an important way to avoid stifling energy investments. Oil and natural gas companies deduct operating costs when filing taxes, just like every business in America.[48] These business expenses for the drilling and preparation of wells are a direct investment in the U.S. economy, creating jobs and stimulating state and local economies. The ability to recover those costs, similar to research and development deductions used by other industries, is key to maintaining cash flow that helps companies drill more wells.

From property taxes that supply revenue for schools, to state and local taxes that fund road and bridge improvements, water and sewer projects, local housing initiatives and environmental programs, to even royalty payments that can sustain family farms and businesses – oil and natural gas development generates local economic benefits well beyond producing affordable, reliable energy.

Tax policy is about more than balancing revenues with expenditures. At its most effective, tax policy can support job growth and encourage investments in America's future. That's especially true for capital-intensive industries like oil and natural gas. Given energy's central place in family budgets and U.S. economic and security objectives, the best tax approach is the one that encourages robust oil and natural gas development.

Economic Impacts of Policy Choices

Projected 2025 Numbers
Source: Wood Mackenzie Energy Consulting.



Keeping Fuel Choices Affordable

Energy security means not just availability of fuels but affordability and choice.

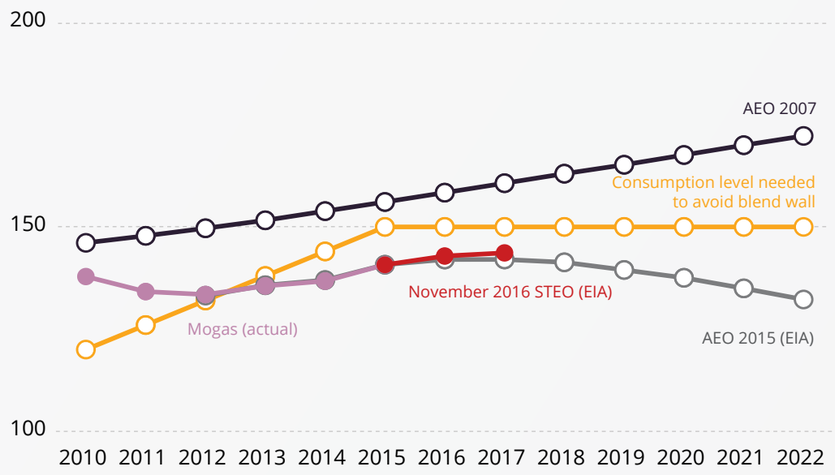
America's refining industry supplied 132 billion gallons of gasoline and 56 billion gallons of ultra-low sulfur diesel in 2015 that fueled the economy.[49, 50] Billions of dollars are invested each year by U.S. refineries, which are the most technologically advanced in the world, making fuels cleaner and more efficient and meeting the needs of consumers for their cars, lawnmowers, power equipment and boats. Maintaining maximum affordability and choice should be a top policy priority for regulators and legislators.

For the Renewable Fuel Standard (RFS), that means aligning ethanol volume requirements with market realities. The Environmental Protection Agency's mandated volume for 2017, which will force an additional nearly 1.2 billion gallons of ethanol and other biofuels into the nation's fuel supply, does not reflect consumer preferences.[51] Availability of ethanol-free gasoline (E0) has declined due to the RFS. However, significant demand remains. Americans purchased 5.3 billion gallons of E0 in 2015,[52] but the EPA 2017 volume requirements incorporate only 200 million gallons.

Market Reality vs. RFS Mandates

Billions of Gallons

Source: EIA and EISA, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MGFUPUS1&f=A

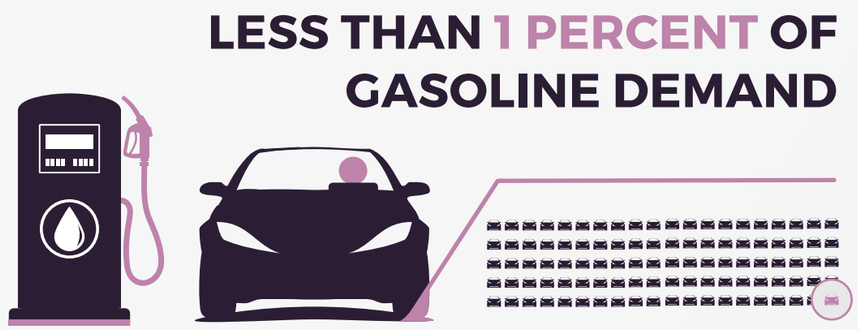


E85 Not a Solution to the Blend Wall

Annual Gasoline Demand

Source: U.S. Department of Energy.

ACCORDING TO THE EIA, THE ANNUAL AMOUNT OF E85 SOLD IN 2015 IS LESS THAN 1 PERCENT OF ANNUAL GASOLINE DEMAND.



To meet its targets, the EPA anticipates increases in the use of higher ethanol blends that experience shows are unrealistic.

In 2015 hearing testimony, the Society of Independent Gasoline Marketers of America/ National Association of Convenience Stores told Congress: "To date, very few retailers selling mid-to high-level ethanol-gasoline blends such as E15 or E85 have seen substantial sales of these products. Quite the opposite: Most retailers that sell E15 or E85 have seen minimal sales of these products. Indeed, retailers have found that even consumers with E85-compatible flex-fuel vehicles tend to purchase E10."[53]

The current trajectory for ethanol requirements pushes us closer to the blend wall,[54] the point at which federal mandates require more ethanol in the fuel supply than can be safely blended as standard E10 gasoline. About 85 percent of vehicles were not designed to use higher blends like E15,[55] which studies show can potentially cause engine damage.[56] In fact, use of higher ethanol blends could even void warranties of some vehicles.

In addition to potentially limiting consumer choice by jeopardizing availability of lower ethanol blends, the RFS could lead to increased fuel costs. A 2015 NERA Economic Consulting study projected a possible 30 percent reduction to the fuel supply and "severe economic harm."[57]

A diverse coalition of restaurant associations,[58] grocers,[59] producers of poultry, pork and beef,[60] environmental non-profits, and anti-hunger groups[61] have called for repeal or significant RFS reform, and editorial boards of major newspapers concur.

Arguing that "there is no doubt it should be repealed," the Washington Post[62] editorial board explains: "Blending more and more ethanol into gasoline will require spending money on infrastructure that is not yet in place and selling more fuel that older and more specialized engines cannot take."

When Congress approved the current RFS in 2007, the U.S. energy outlook was vastly different. Today, U.S. success as the world's leading producer of oil and natural gas has helped advance the primary goals of the RFS. Increases in domestic production have helped drive down energy imports, fuel costs and – through greater use of clean-burning natural gas – greenhouse gas emissions. To preserve consumer choice, maintain affordability and prevent potential engine damage and economic harm, federal ethanol policy should be overhauled to reflect consumer preferences, vehicle needs and America's 21st century energy reality.

USA Today calls the mandate a "folly" that "forces consumers to buy billions of gallons of ethanol, a costly and inferior fuel produced mostly from corn."[63]

CONCLUSION

The American people want, and the economy and future generations deserve, affordable, reliable and abundant energy that can be developed and delivered safely and with respect for our environment.

The only way we will achieve that important goal is through a true all-of-the-above, market-based and consumer-focused national energy policy. Fortunately, what it takes to remain a world leader in energy production is not a matter of guesswork or abstract theory. We know what works when it comes to American energy because in just a few short years our nation has emerged from decades of energy scarcity, dependency and uncertainty into this new era of American energy abundance and leadership.

At the beginning of a new presidency and a new Congress, we urge our nation's leaders to embrace the American energy revolution already underway. Future generations of Americans deserve nothing less.

As we look to the future, the oil and natural gas industry stands ready to offer solutions that help meet the energy needs of our nation and the world, and to work with elected leaders at all levels of government to ensure that the American consumer continues to benefit from affordable and reliable domestically produced energy.

Above all, we will remain responsible stewards of the natural resources we develop and a good neighbor and citizen to the communities in which we operate. The oil and natural gas industry is committed to forging a consensus on energy policy that drives economic growth, increases American competitiveness and provides to our allies an energy partner that uses its considerable energy resources as a way to lift people up.

Our central message to President Trump, members of Congress, and state and federal regulators is straightforward: Energy is fundamental to our society. Thanks to American innovation and entrepreneurial spirit, the United States is the world's leading producer of oil and natural gas, as well as the leading refiner of fuels and petrochemicals. And we welcome the partnership of anyone who shares our vision of a brighter, prosperous and environmentally responsible energy future for our nation.

We believe that our nation's best future will only be achieved through an all-of-the-above national energy strategy that recognizes the fundamental role of oil and natural gas.

What we want and what the American people deserve is energy policy that continues our nation's status as a global energy leader. What the State of American Energy report makes abundantly clear is that American energy is American progress. And that energy is fundamental to our quality of life in ways both small and large.

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