





## Vote4Energy

Jack Gerard, The American Petroleum Institute



A handwritten signature in black ink that reads "Jack Gerard". The signature is fluid and cursive.

Jack N. Gerard  
President and CEO  
API

I am pleased to offer the 2016 State of American Energy report, which details the economic, job creation, energy security and global leadership opportunities created by our nation's 21<sup>st</sup> century energy revolution and the policy challenges we must overcome to ensure that these benefits extend for generations to come.

The report demonstrates that oil and natural gas are fundamental to our modern way of life and high standard of living. Combined, these sources supply more than 60 percent of the energy Americans use every day. Moreover, they are the building blocks of thousands of products that make our lives more comfortable, safer, cleaner and healthier. Today our nation is the world's leader in oil, natural gas and refined product production.

This abundant supply of affordable and reliable energy is made possible by the hard work of the millions of women and men who work directly for our industry or for businesses that support the oil and natural gas industry. The women and men of the oil and natural gas industry disprove the false choice peddled by some that we must choose between energy development and responsible environmental stewardship. Their hard work continues to drive more domestic energy production than ever before with an impact on the environment that grows ever smaller.

State of American Energy 2016 highlights how energy choices made at the federal level directly affect the lives and livelihoods of families and communities at the local level. And it underscores the need for a national energy policy discussion that is focused on what's most important: American jobs, growing the economy, making our nation more energy secure and strengthening our nation's global energy leadership. In that regard this year's report focuses on a few key policy areas that are essential to those goals: Creating energy opportunities through greater access to energy resources, getting our nation's fuel policy right, sustaining America's hydraulic fracturing-driven energy revolution, leading environmental protection efforts, strengthening our world-class refining sector, building a brighter energy future through strategic infrastructure investments, providing greater choice to America's consumers, and securing America's energy future through smart and responsible development and science-based energy policies.

Between 2009 and 2011, while the nation's economy was still weak and recovering, jobs supported by the oil and natural gas industry increased by 600,000, making it one of the few bright spots in our economy for several years. And while the recent, drastic drops in the price of oil have led to some restructuring in the oil industry, unfortunately including layoffs, this is not the long-term story or trend for the industry.

The industry's economic benefits extend to every state in the union. More than 30,000 small businesses are involved in upstream oil and natural gas operations alone, including tens of thousands of operators, contractors, service companies, suppliers and other vendors who support oil and natural gas operations.

To give a sense of the reach and scope of the industry, each chapter of this report examines the distinctive policy challenges and opportunities through highlights of these issues in seven regions that include all 50 states. The report makes clear that the economic benefits and opportunities provided by the oil and natural gas industry aren't confined to energy-producing states and that the industry could do more with the right energy policies based on market principles and sound science.

# Introduction | Vote4Energy

The American Petroleum Institute

## 2016 Will Be Pivotal to Our Nation's Energy Future.

In November, we will cast ballots and choose who will be our next president and which party will control Congress, state legislatures and governorships. Voting is about choice and is the collective expression of the direction we want our country to take. At its best, it creates a national consensus on our shared future.

When it comes to energy policy, the next president and members of the next Congress will play a critical role in shaping America's 21<sup>st</sup> century energy renaissance, determining whether our nation will cement its position as a global energy leader. The energy policy conversation is about more than oil and natural gas development. It is about American competitiveness, international influence, national security and long-term economic strength and prosperity.

The American Petroleum Institute's Vote4Energy voter education campaign encourages America's voters to understand more about our country's energy realities and to learn more about those who seek to lead our nation and what their position on important energy policies could mean for the future of our nation.

The overriding goal of the campaign is to continue America's 21<sup>st</sup> century energy revolution, which is a direct result of American innovation, our unique form of government and strong tradition of entrepreneurial spirit – all of which helped bring about advances in the decades-

old practice of hydraulic fracturing and directional drilling that has unlocked unimagined quantities of oil and natural gas in the United States.

America's oil and natural gas industry supports approximately \$1.2 trillion in U.S. gross domestic product and provides tens of millions of dollars a day to the federal government in the form of royalties and bonuses paid at lease sales and taxes. With the right energy policies, the oil and natural gas industry could support as many as an additional 1 million American jobs in 2025 and 2.3 million by 2035 according to a 2015 study by Wood Mackenzie.<sup>1</sup>

The study also illustrates the stark differences between the two policy paths available. Specifically, pro-development policies could increase cumulative local, state and federal government revenue by over \$1 trillion, lower average annual household energy expenses by \$360 by 2035 and boost nationwide household discretionary income by as much as \$508 billion cumulatively over the next 20 years. A path of regulatory constraints would lead to a cumulative decrease of \$500 billion in government revenue from 2016 to 2035 and increase by \$242 the cost of energy annually for the average household.<sup>2</sup>

It is simple: If we are to create a better energy and economic future, we'll need policymakers who are willing to collaborate with the oil and natural gas industry to responsibly develop, refine and deliver the immense energy potential we have in our country.

The goal of the Vote4Energy campaign is to get our nation's energy policy right today so that future generations of Americans live in a country of energy abundance, economic prosperity and global energy leadership.

The Vote4Energy campaign is not about an individual or party and hews to no ideology other than ensuring that our nation pursues energy policies that embrace America's 21<sup>st</sup> century energy renaissance and global energy leadership.

The program is built on three simple pillars:

- The safe, responsible and growing development, production, refinement and transportation of American-made energy;
- A true all-of-the-above energy strategy that values and leverages America's full range of energy resources; and
- Forward-thinking energy policies that sustain and grow American prosperity here at home and our influence in the world.

The campaign is based on the understanding that the right energy policies can help ensure the United States remains a global energy leader capable of playing a positive role in the world's energy markets. Vote4Energy seeks to focus the attention of the voter on energy issues during the political cycle, so that elected officials will stand with America's workers and families and will work with industry to create economic opportunity for thousands of Americans and deliver affordable energy to consumers.

# Table of Contents | Vote4Energy

The American Petroleum Institute

Our nation is at a crossroads, and there is no guarantee that the progress we've made in the last few years will endure. The next president – as well as members of Congress, governors and state legislators – will be called on to decide between two paths.

We can pursue an American future of energy abundance, security and global leadership, or take a step back to an era of scarcity, dependence and uncertainty.

Vote4Energy will ask all candidates – Republican and Democrat alike – to share with voters their vision for America's future and which path they would pursue if elected. And it will ask debate moderators and political pundits to raise important questions about America's energy future during the 2016 presidential campaign.

Vote4Energy will encourage a comprehensive conversation about our nation's energy future by engaging voters and policymakers in a productive, fact-based discussion. And it will foster conversations with voters about our candidate: U.S. energy production, refining and the energy infrastructure that makes it possible.

## MESSAGE

**From Jack Gerard ..... 1**

## INTRODUCTION:

**Vote4Energy ..... 2**

## SECTION 1:

**East: Energy Opportunity ..... 5**

## SECTION 2:

**Southeast: Untapped Energy Potential ..... 11**

## SECTION 3:

**Gulf Coast: Fueling America ..... 17**

## SECTION 4:

**Pacific: Energy Policy Hits Home ..... 23**

## SPECIAL SECTION:

**What America Is Thinking on Energy ..... 26**

## SECTION 5:

**Arctic: Energy Security ..... 29**

## SECTION 6:

**Mountain West: Environmental Leadership ..... 33**

## SECTION 7:

**Central: Building a Secure Energy Future ..... 41**

## CONCLUSION:

**America's Energy Future for Generations to Come ..... 46**

## REFERENCES

**Sources ..... 48**

Maine - **"WE HAVE AFFORDABLE NATURAL GAS RIGHT IN OUR BACKYARD AND HYDROPOWER JUST OVER THE BORDER IN CANADA AND RIGHT HERE IN MAINE. LET'S USE IT!"**

- Gov. Paul LePage (R)

New Hampshire - **THE BAN ON CRUDE OIL EXPORTS IS EXPECTED TO COST THE NEW HAMPSHIRE ECONOMY UP TO \$130 MILLION PER YEAR BY 2020.**

Rhode Island - **NATURAL GAS FUELED 95 PERCENT OF RHODE ISLAND'S NET ELECTRICITY GENERATION IN 2014.**

New Jersey - **AVERAGE SALARY FOR NON-GAS STATION OIL AND NATURAL GAS EMPLOYEES IS \$91,535, COMPARED TO \$60,104 ACROSS OTHER STATE INDUSTRIES.**

Delaware - **OIL AND NATURAL GAS DEVELOPMENT IN THE ATLANTIC COULD CREATE \$2.4 BILLION IN NEW PRIVATE INVESTMENT IN DELAWARE AND RAISE \$475 MILLION FOR THE STATE BUDGET BY 2035 WITH REVENUE SHARING IN PLACE.**

Vermont - **THE TRANSPORTATION SECTOR ACCOUNTS FOR THE LARGEST SHARE OF VERMONT'S ENERGY USE, 36.8 PERCENT.**

Massachusetts - **MASSACHUSETTS WILL BE HARD-PRESSED TO MEET ITS FUTURE ENERGY NEEDS WITHOUT EXPANDING NATURAL GAS PIPELINE CAPACITY.**

- Department of Energy Resources Study

New York - **"[EPA OZONE REGULATIONS] WOULD COME WITH A HIGH COST TO INDUSTRY..."**

- New York Times

Ohio - **255,100 STATEWIDE JOBS SUPPORTED BY THE OIL AND NATURAL GAS INDUSTRY.**

Connecticut - **NATURAL GAS IS THE LARGEST SOURCE OF CONNECTICUT'S ENERGY CONSUMPTION.**

West Virginia - **"LIFTING THE BAN ON OIL EXPORTS WILL ALSO IMPROVE OUR NATIONAL SECURITY INTERESTS..."**

- Sen. Joe Manchin (D)

Pennsylvania - **NEARLY 340,000 PENNSYLVANIA JOBS ARE SUPPORTED BY THE OIL AND NATURAL GAS INDUSTRY.**

Maryland - **"WE WANT TO EXTRACT CLEAN NATURAL GAS."** - Gov. Larry Hogan (R)



# EAST

## RECENT POLL OF VOTERS FOUND:

79%

SUPPORT INCREASED PRODUCTION OF U.S. OIL AND NATURAL GAS RESOURCES

65%

OPPOSE HIGHER TAXES THAT COULD DECREASE ENERGY PRODUCTION

78%

SUPPORT INCREASED DEVELOPMENT OF THE COUNTRY'S ENERGY INFRASTRUCTURE

76%

OPPOSE LEGISLATION THAT COULD INCREASE THE COST OF OIL AND NATURAL GAS OPERATIONS

# East | Energy Opportunity

## U.S. Oil and Natural Gas Production

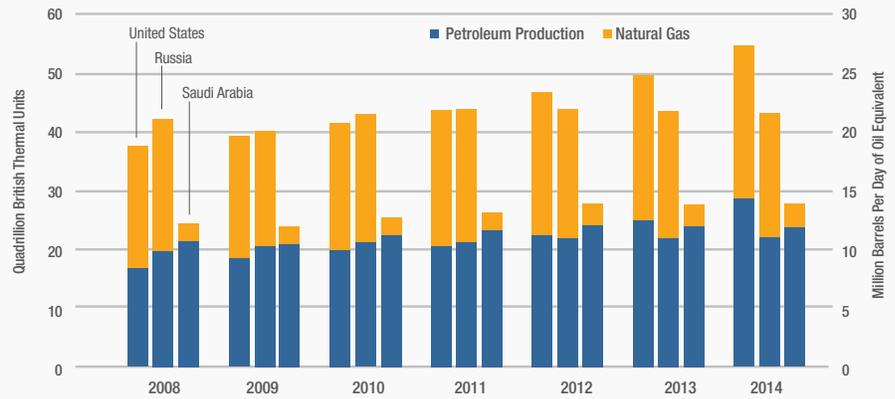
Just a decade or so ago, the United States was on a downward-spiraling path of energy dependency – a path marked by scarcity, limited options and uncertainty stretching well into the future. U.S. oil and natural gas production was declining, and our reliance on other countries for energy was rising at an alarming rate.

Thanks to safe, modern hydraulic fracturing and technologically advanced horizontal drilling – much of it occurring in the prolific Marcellus and Utica shale plays in the East – that narrative has been turned on its head. In the East and other parts of the country these technologies (often referred to as “fracking”) have made the United States the world’s leading producer of oil and natural gas,<sup>3</sup> launching an American energy revolution that has fundamentally changed the world energy order.

### The Shale Natural Gas Revolution

Rising natural gas production and the increased use of gas in American homes, businesses and in the utility sector are hallmarks of this energy renaissance. Leaders from the president on down now talk about a 100-year supply of natural gas.<sup>4</sup> Because of ever-improving fracking and drilling technologies, some believe U.S. reserves could extend beyond that.<sup>5</sup> Instead of needing to import gas to meet domestic needs, the U.S. now is positioned to export liquefied natural gas (LNG) – with the potential to lift our economy, reduce the United States’ trade deficit and help allies abroad. All thanks to safe and responsible fracking.

### U.S., Russia and Saudi Arabia Petroleum and Natural Gas Production



Source: <http://www.eia.gov/todayinenergy/detail.cfm?id=20692&src=email>

It’s a rapidly accelerating revolution. Shale natural gas accounted for only 5 percent of total U.S. dry gas output in 2004, according to the U.S. Energy Information Administration (EIA).<sup>6</sup> That doubled to 10 percent in 2007 and now is 56 percent of production. IHS estimates that unconventional energy developed with fracking increased each American household’s disposable income by \$1,200 in 2012 and projects the benefit will rise to more than \$3,500 in 2025.<sup>7</sup> Meanwhile, a broad range of manufacturers are opening or expanding U.S. operations because lower-cost natural gas is available as a power source and as a feedstock for finished products.<sup>8</sup>

It’s also a job-creating revolution. The shale, or unconventional, oil and natural gas value chain and energy-related chemicals activity together support more than 2.1 million jobs nationwide. By 2025, IHS says, these will support nearly 3.9 million jobs.<sup>9</sup>

### Big Shale Plays Dominate Eastern Output

Perhaps nowhere in the country are the benefits and opportunities of hydraulic fracturing and shale energy better illustrated than in the East. EIA says the Marcellus and Utica shale plays have provided 85 percent of U.S. shale gas production growth since 2012<sup>10</sup> – with Marcellus output increasing from approximately 1 billion cubic feet per day in 2007 to 16 billion cubic feet per day in 2015.<sup>11</sup> This is creating jobs and generating economic growth as states, communities and industry manage the logistics of rapid growth – finding the balance between infrastructure needs, support services and environmental objectives.

In the East, Pennsylvania, Ohio and West Virginia lead the way in energy development. According to PwC, energy activity supported nearly 340,000 jobs in Pennsylvania and was responsible for \$34.6 billion added to the state’s economy in 2011, the most recent data year available.<sup>12</sup> In Ohio, energy supported more than 255,000 jobs, added

# East | Energy Opportunity

## U.S. Oil and Natural Gas Production

\$28.4 billion to the state economy and paid an average salary of nearly \$76,000 to non-gas station oil and natural gas employees (compared to the state average of less than \$45,500 for all industries). In West Virginia, energy activity supported 80,400 jobs and contributed \$5.8 billion to the state economy.

The benefits of energy exploration and production aren't limited to resource-rich states. Even in New York, where energy development remains largely on hold, the energy sector's long economic reach is making significant contributions, with oil and gas supporting 270,600 jobs – most of them in the hundreds of businesses up and down the energy supply chain located there.<sup>13</sup> Similarly, a number of businesses located in Massachusetts help support the shale revolution,<sup>14</sup> and altogether more than 106,000 state jobs exist because of oil and gas, according to PwC.<sup>15</sup> Energy supports jobs throughout the East – from Maine (28,800 jobs) to Maryland (75,400).

### Meeting Challenges

Safe, responsible energy development has been and continues to be industry's objective – in fact, API was founded as a standards-setting organization and currently has more than 700 standards covering every aspect of oil and gas operations, including 200 regarding fracking and other upstream operations.



Reflecting industry's commitment to safe operations, API-member companies and key non-industry stakeholders have developed a program of standards and practices – accredited by the American National Standards Institute, the same body that accredits several national laboratories – to advance safety for workers, communities and the environment. These include specific standards for well integrity and water management, as well as practices to mitigate the surface impacts of hydraulic fracturing and the many other elements of operations.

Industry's commitment to safety includes the FracFocus.org chemical disclosure registry<sup>16</sup> managed by the Ground Water Protection Council (GWPC) and the Interstate Oil and Gas Compact Commission, which provides to the public detailed, searchable data on specific wells. Now in its third revision, the registry covers more than 99,000 wells. These, together with strong state and federal regulatory oversight, form the architecture to help ensure safe and responsible development, which is key to sustaining the public's support.

Recent analysis finds that this structure is working. Most significantly, EPA's draft study of hydraulic fracturing and its potential impacts on drinking water found no evidence that fracking has led to "widespread, systematic impacts on drinking water resources in the United States."<sup>17</sup> The EPA study said fractures created by hydraulic fracturing are "highly unlikely to extend upward from these deep formations into shallow water aquifers." The agency also noted that water used in fracking amounts to less than 1 percent of the U.S. annual total.

These findings endorse the primary role that's being played by the states to provide effective, efficient oversight that's tailored to the specific geology, hydrology and other resource characteristics in each state. From 2009 to 2013 state agencies created an estimated 82 groundwater-related rules for oil and natural gas production – as well as hundreds of discrete rule changes, according to a GWPC report. Pennsylvania, for example, can require more than 38 different permits<sup>18</sup> for natural gas development.<sup>19</sup>

Bottom line: Hydraulic fracturing is heavily regulated by the states and the federal government,<sup>20</sup> with various federal environmental and public health statutes applying, according to the U.S. Government Accountability Office.<sup>21</sup> These include the Safe Drinking Water Act; the Clean Water Act; the Clean Air Act; the Resources Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation, and Liability Act; and the Emergency Planning and Community Right-to-Know Act.

#### Emissions Progress

Innovation and technology are helping curb emissions of methane. From 2005 to 2013 – during a period when natural gas production from areas like the Marcellus and Utica shale plays increased dramatically – methane emissions from natural gas production fell 38 percent, according to EPA's 2015 Inventory of U.S. Greenhouse Gas Emissions and Sinks.<sup>22</sup> Methane emissions from hydraulically fractured wells declined 79 percent during the same period, EPA found.

That methane emissions from natural gas production are trending lower is consistent with findings in a number of studies showing low leakage rates. A major field study of 130 facilities found that 101 had loss rates below 1 percent – or, put another way, they had methane containment of more than 99 percent.<sup>23</sup> A collection of studies from the Barnett Shale play in Texas also showed low leakage rates – 1.2 percent<sup>24</sup> – a rate well below the 3.2 percent cited by a leading

environmental organization as the point where the environmental advantages of natural gas in power generation are realized.

Progress on reducing methane emissions from industry operations underscores a pair of points: The first is that industry is continually working to improve operations – to safely maximize recovery of oil and gas resources, including capturing methane. The second is that conducting environmentally responsible operations also means delivering more energy to consumers. There's a strong incentive for industry to operate this way, hence the continuing push for improved technologies, a number of which EPA subsequently incorporated in its Natural Gas STAR program and regulations. Given this progress, EPA's 2015 proposal for regulating methane emissions in natural gas development not only is misguided and unnecessary but would add regulatory burdens that could increase costs and stifle innovation.

Clean water and air is a key objective of safe energy development. Our employees work and live in areas under development. Safety and environmental protection are fully integrated into the way our companies operate, often exceeding what is required by law – because doing our work safely and responsibly is what it means to be a good steward and neighbor.



**EPA's draft hydraulic fracturing** study found no evidence that fracking has led to “widespread, systematic impacts on drinking water resources in the United States.”

# East | Energy Opportunity

## U.S. Oil and Natural Gas Production

### Looking to the Future

America's shale energy revolution is writing a new future for the United States – yet that story won't be finished without more investment, more innovation and more energy development, made possible by pro-energy policy choices. A number of these points are illustrated in the Eastern U.S.

Take access to resources: Pennsylvania and New York are the stars in a tale of two energy states. Both sit atop the natural gas-rich Marcellus shale play, but they're taking diametrically opposed paths on development.

Pennsylvania is open for business, managing development to benefit communities and individual residents. These benefits include jobs and the economic boost they provide across the state economy – service companies and suppliers that support operations and also non-energy businesses like restaurants, grocery stores, hotels and more that meet the needs of energy workers and their families. There's also the benefit to the commonwealth from \$2.1 billion in tax revenue from energy activity from 2007 through 2014,<sup>25</sup> as well as \$856 million in impact fee collections (2011-2014) that are distributed to local governments.<sup>26</sup>

To the north, New York's fracking moratorium continues to leave that state's natural gas resources largely untapped, in the ground. The once-prosperous Southern Tier region of the state, just across the state line from Pennsylvania, faces significant economic challenges, yet its own Marcellus shale wealth is kept off limits by state policy – unavailable

to provide work for the region's young people, unavailable to provide economic stimulus to lift local businesses, unavailable to landowners who could harness the minerals beneath their feet to rescue struggling family farms.<sup>27</sup>

More broadly, the forward momentum of the shale revolution is threatened by over-regulation as federal agencies move to impose new layers of rules that could hinder safe development, which is already well-monitored by the states. The Bureau of Land Management may soon enact new fracking regulations for federal and Indian lands that could slow production with new costs and red tape – without appreciably adding meaningful safety or environmental benefits.<sup>28</sup> EPA has proposed new rules on methane emissions, despite the progress noted above.<sup>29</sup> These are but two examples among dozens that threaten future investment. For the revolution to continue apace, commonsense regulatory approaches are needed that acknowledge the effective oversight already being provided by the states, under both state and federal laws.



**Pennsylvania**  
**is open for**  
**business,**  
managing  
development  
to benefit  
communities  
and individual  
residents.

## Energy by the Numbers

### Infrastructure

Apart from access to reserves and commonsense regulation, America's shale revolution needs infrastructure investment and a regulatory process that supports private investment in these vital projects. In the oil and natural gas industry, America has a proven partner that has demonstrated its willingness to invest in the United States. Six oil and natural gas companies earned places on the Progressive Policy Institute's top 25 in 2014 U.S. capital investments with \$44.7 billion.<sup>30</sup>

Infrastructure needs in the East are one example of the energy infrastructure necessary across the United States to fully capitalize on increased domestic oil and natural gas production. Infrastructure is needed to bring oil to East Coast refineries that are suited to process lighter crudes from the Upper Plains states. Infrastructure also is needed to bring natural gas to New England to produce heat and affordable electricity for its homes and businesses. Despite being adjacent to the abundant Marcellus shale, New England residents paid up to 68 percent more for electricity than the national average in winter 2014, according to EIA estimates, while the industrial sector paid up to 105 percent more for its electricity than the national average – in part because of infrastructure limitations.<sup>31</sup> One study estimates that failing to expand natural gas and electricity infrastructure could cost New England households and businesses \$5.4 billion in higher energy costs and more than 167,000 private-sector and construction jobs between 2016 and 2020.<sup>32</sup>



**FAILING TO EXPAND NATURAL GAS AND ELECTRICITY INFRASTRUCTURE COULD COST NEW ENGLAND HOUSEHOLDS AND BUSINESSES**

**\$5.4 BILLION**

**IN HIGHER ENERGY COSTS AND MORE THAN 167,000 PRIVATE-SECTOR AND CONSTRUCTION JOBS BETWEEN 2016 AND 2020**

Source: New England Coalition for Affordable Energy



**\$2.1 BILLION**

**THE BENEFIT TO PENNSYLVANIA IN TAX REVENUE FROM ENERGY ACTIVITY FROM 2007 THROUGH 2014, AS WELL AS \$856 MILLION IN IMPACT FEE COLLECTIONS THAT ARE DISTRIBUTED TO LOCAL GOVERNMENTS**

Source: Pennsylvania Department of Revenue; Pennsylvania Public Utilities Commission



**SIX OIL AND NATURAL GAS COMPANIES EARNED PLACES ON THE PROGRESSIVE POLICY INSTITUTE'S TOP 25 IN TOTAL 2014 U.S. CAPITAL INVESTMENTS WITH**

**\$44.7 BILLION**

Source: Progressive Policy Institute

Virginia - **"IF WE PROCEED IN A SMART AND SAFE WAY WE CAN UNLOCK GAS, OIL AND WIND ASSETS OFFSHORE WHILE PROTECTING OUR ENVIRONMENT."**

- Gov. Terry McAuliffe (D)

North Carolina - **"NEW GEOLOGICAL AND GEOPHYSICAL SURVEYS ARE NECESSARY TO PROVIDE THE CRITICAL DATA REQUIRED FOR INFORMED EXPLORATION, DEVELOPMENT AND ENVIRONMENTAL DECISIONS. MOST SEISMIC INFORMATION FOR THE ATLANTIC IS MORE THAN THREE DECADES OLD. WITH ADVANCED SEISMIC DATA COLLECTION AND COMPUTER MODELING, THE INDUSTRY WILL BE BETTER EQUIPPED TO SAFELY RECOVER OIL AND GAS RESOURCES AND SITE OFFSHORE WIND ENERGY TURBINE GENERATORS."**

- Gov. Pat McCrory (R)

South Carolina - **"EXPLORING FOR ENERGY OFF THE COAST IS A CRITICAL ECONOMIC DEVELOPMENT ISSUE. IT WILL MEAN JOBS AND INVESTMENT FOR OUR STATE, AND, WHILE WE WILL ALWAYS MAKE SAFEGUARDING OUR RICH NATURAL RESOURCES A PRIORITY, IT'S ENCOURAGING TO SEE THE FEDERAL GOVERNMENT FINALLY ACKNOWLEDGE WHAT WE'VE BEEN FIGHTING FOR WITH OUR FEDERAL DELEGATION FOR YEARS."**

- Gov. Nikki Haley (R)

Florida - **CRUDE EXPORTS COULD ADD UP TO 10,736 JOBS AND \$1.23 BILLION TO FLORIDA'S ECONOMY IN 2020.**

Georgia - **349 GEORGIA BUSINESSES ARE PART OF THE OIL AND NATURAL GAS SUPPLY CHAIN.**



## SOUTHEAST

RECENT POLL OF VOTERS FOUND:

87%

AGREE INCREASED ACCESS  
COULD HELP STRENGTHEN  
ENERGY SECURITY

77%

SUPPORT INCREASED  
PRODUCTION OF U.S. OIL AND  
NATURAL GAS RESOURCES

64%

SUPPORT OFFSHORE  
DRILLING FOR OIL AND  
NATURAL GAS

88%

AGREE THAT INCREASED  
ACCESS COULD HELP  
CREATE JOBS

# Southeast | Untapped Energy Potential

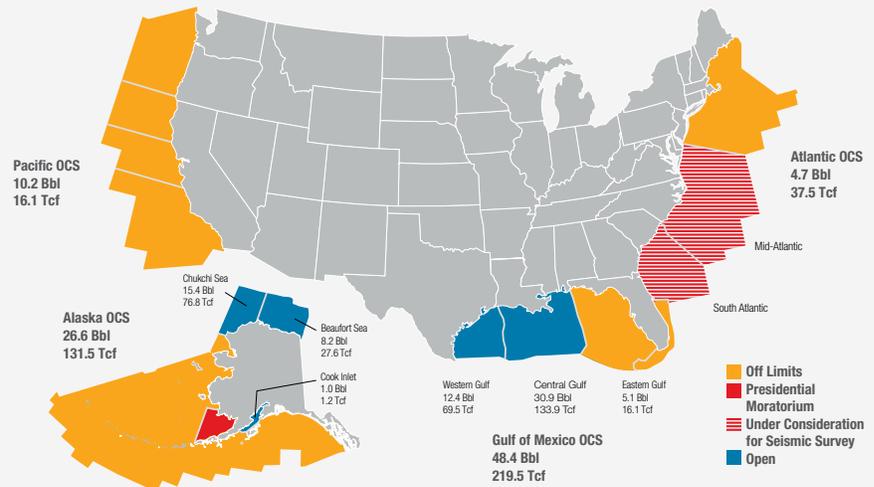
## Offshore Development Opportunities

The states of the Southeast have struggled to fully participate in the American energy resurgence, as the federal government has forced them to the sidelines. As part of the 87 percent<sup>33</sup> of federally controlled offshore acreage that is off limits to energy exploration, potentially significant geologic formations in the Atlantic Outer Continental Shelf (OCS) and Eastern Gulf of Mexico that could hold billions of barrels of untapped resources have been left out of the U.S. energy revolution that is transforming state economies in other regions.

During the 30-plus years federal policy has forfeited energy opportunities in most offshore areas, exploration, drilling and production technologies have advanced so much that previous resource estimates for southeastern coastal areas are obsolete. Revised estimates from the Bureau of Ocean Energy Management (BOEM) released in 2014 reveal that 4.72 billion barrels of technically recoverable oil and 37.51 trillion cubic feet of technically recoverable natural gas could be awaiting discovery off the Atlantic Coast.<sup>34</sup> Estimates have jumped just since 2011 assessments, when oil and natural gas estimates were 43 percent and 20 percent lower, respectively. Notably, these revised estimates have been done without the benefit of modern seismic surveying technology, which could reveal even more potential resources.

Voters in Virginia, North Carolina, South Carolina, Georgia and Florida support offshore energy exploration and believe increased access could help create jobs, lower energy costs for consumers and strengthen American energy security.<sup>35</sup>

## U.S. Offshore Undiscovered Technically Recoverable Federal Oil and Natural Gas Resources (billion barrels - Bbl and trillion cubic feet - Tcf)



Source: The Bureau of Ocean Exploration and Management (BOEM) - <http://www.boem.gov>

Multiple studies confirm significant economic benefits are waiting to be unlocked along with energy resources in the coastal Southeast. Offshore oil and natural gas development is a long-term investment, and decisions made this decade will impact U.S. energy potential for decades to come. To realize the full advantages of our energy resources and maintain global energy leadership, expanding offshore access to new areas is essential.

### Offshore Energy Drives Job Growth

After decades of missed opportunity, federal policy is inching closer to opening additional offshore areas to energy development – and major economic growth. Yet a commitment to fully embrace a forward-thinking offshore energy strategy is still lacking. Allowing oil and natural gas exploration in areas in the Atlantic,<sup>36</sup> Pacific<sup>37</sup> and Eastern Gulf of Mexico<sup>38</sup> could create nearly 840,000 jobs and boost domestic energy production by 3.5 million barrels of oil equivalent per day

by 2035, according to studies by Quest Offshore Resources. Energy development in these areas could also generate more than \$200 billion in cumulative revenue for the government, lead to nearly \$450 billion in new private sector spending and contribute more than \$70 billion per year to the U.S. economy.<sup>39</sup> Atlantic development alone could create nearly 280,000 jobs by 2035, grow the economy by up to \$23.5 billion per year and result in production equal to about 70 percent of current Gulf output, according to Quest.<sup>40</sup>

Development in the Eastern Gulf of Mexico could support nearly 230,000 jobs, produce nearly 1 million barrels of oil equivalent per day, contribute over \$18 billion per year to the U.S. economy and generate \$70 billion in cumulative government revenue.<sup>41</sup>

Currently, the Department of Interior's Draft Proposed Leasing Program for 2017-2022<sup>42</sup> barely opens the door to greater OCS access. Promising areas in the Pacific OCS and the

# Southeast | Untapped Energy Potential

## Offshore Development Opportunities

Eastern Gulf of Mexico are left out entirely, and the next Five Year Program includes just one potential lease sale for the Atlantic OCS and not until 2021. Two additional steps remain in a leasing program development process that is designed to winnow down the areas offered for lease, so access to the Atlantic is far from assured.

Bipartisan coalitions<sup>43</sup> in the House and Senate have written to Interior Secretary Sally Jewell, calling for greater access.

A letter from the Outer Continental Shelf Governors Coalition, which includes Democrat and Republican governors from Atlantic coastal states plus Louisiana and Alaska, points out that “once an area is narrowed, it cannot be expanded without an act of Congress or restarting the entire Five Year Program development process” and urges BOEM to “preserve the full extent of all eight OCS planning areas.”<sup>44</sup>

Given the long lead time – as much as 10 to 15 years – required to develop offshore projects, failure to make additional areas available for leasing in the Five Year OCS Leasing Program can set progress back decades. Long-term energy security and economic growth for southeastern states and the entire nation depend on expanded offshore exploration opportunities.

### Unlocking Energy Potential Through Seismic Technology

Much of what we know about offshore resource potential is based on surveys conducted over 30 years ago. That’s set to change with BOEM’s July 2014 decision<sup>45</sup> to allow seismic testing to map offshore

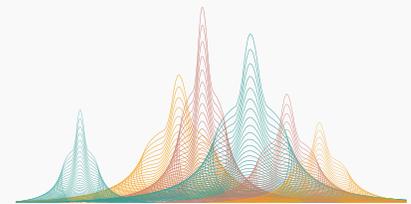
energy reserves in portions of the Atlantic. Citing “the need to update the nearly four-decade-old data in the region while protecting marine life and cultural sites,”<sup>46</sup> BOEM took a step toward preliminary exploration in waters from southern New Jersey to roughly the midpoint of Florida. After an arduous, lengthy permitting process, no seismic surveys were conducted in 2015, but they could commence in 2016.

Seismic surveying is an advanced, carefully regulated technology that works like an ultrasound.<sup>47</sup> Releasing compressed air into the water creates sound waves that penetrate deep into the subsurface rock at the bottom of the ocean and reflect back to the surface, where sensors make recordings that allow scientists to produce detailed 3-dimensional maps that give engineers the information they need to identify the safest and most efficient drilling locations.

Noise levels created by seismic surveys are comparable in volume to the sounds of sperm whales echo-locating for prey, wind and wave action, rain and shipping operations. Surveyors follow strict guidelines to protect marine ecosystems, increasing sound levels gradually to allow sensitive animals to leave the area and halting operations immediately if visual observers or acoustic monitoring devices detect sensitive marine life in the vicinity.

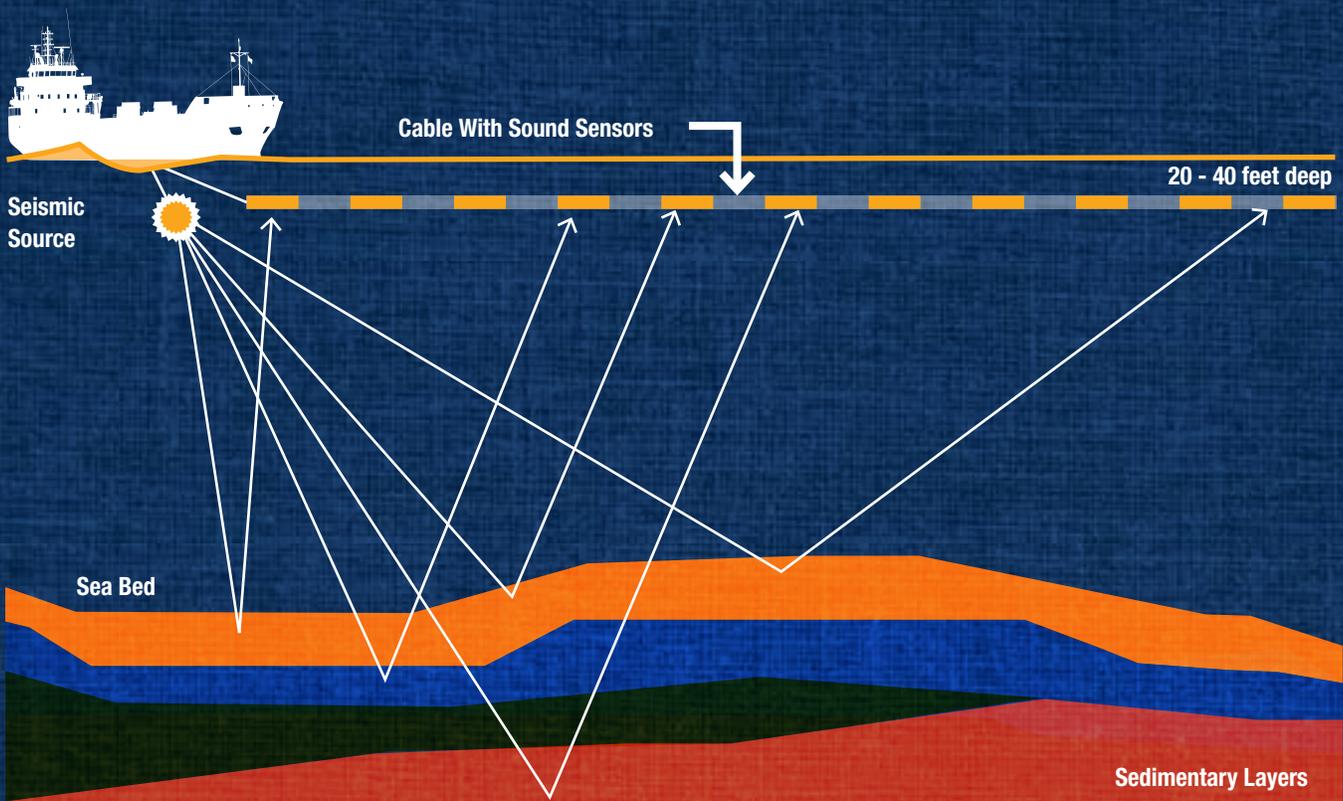
BOEM Chief Environmental Officer William Brown describes the technique’s safe track record: “To date, there has been no documented scientific evidence of noise from air guns used in geological and geophysical (G&G) seismic activities adversely affecting

marine animal populations or coastal communities. This technology has been used for more than 30 years around the world. It is still used in U.S. waters off of the Gulf of Mexico with no known detrimental impact to marine animal populations or to commercial fishing.”<sup>48</sup> Continual improvements in seismic technology throughout its 30-year history make it even more effective today. Seismic surveying is a critical step in understanding offshore resource potential and ultimately realizing that potential through safe exploration.



**Seismic surveying** is technology that works like an ultrasound. Releasing compressed air into the water creates sound waves.

## Seismic Technology for Offshore Energy Development



ALLOWING OIL AND NATURAL GAS EXPLORATION IN AREAS IN THE ATLANTIC, PACIFIC AND EASTERN GULF OF MEXICO COULD CREATE NEARLY

**840,000 JOBS**



ENERGY DEVELOPMENT IN THESE AREAS COULD ALSO GENERATE MORE THAN

**\$200 BILLION**

IN CUMULATIVE REVENUE FOR THE GOVERNMENT

ALLOWING OIL AND NATURAL GAS EXPLORATION IN AREAS IN THE ATLANTIC, PACIFIC AND EASTERN GULF OF MEXICO COULD BOOST DOMESTIC ENERGY PRODUCTION BY

**3.5 MILLION BARRELS**

PER DAY OF OIL EQUIVALENT



AND LEAD TO NEARLY \$450 BILLION IN NEW PRIVATE SECTOR SPENDING AND CONTRIBUTE MORE THAN

**\$70 BILLION**

PER YEAR TO THE U.S. ECONOMY

# Southeast | Untapped Energy Potential

## Offshore Development Opportunities

### Center for Offshore Safety: Continuous Progress and Accountability

Comprehensive, continuous efforts implemented by the oil and natural gas industry in coordination with federal regulators are proving effective in further improving safety for offshore energy development.

The Center for Offshore Safety (COS) was launched in 2011 to promote the highest level of safety for offshore drilling, completions and operations. Through effective leadership, communication, teamwork, utilization of disciplined safety management systems, monitoring and independent third-party auditing and certification, COS works to achieve continual safety improvements. The center released a first-of-its-kind annual report in 2015 to measure safety performance. Compiled from industry data and independent third-party audits, the report found that 96 percent of planned critical offshore maintenance, inspections and testing were performed on schedule in 2013,<sup>49</sup> and that rate improved to 99 percent in 2014.<sup>50</sup>

COS has created tools to assist companies in building or enhancing Safety and Environmental Management Systems (SEMS), and three COS guidelines have been adopted by the Bureau of Safety and Environmental Enforcement (BSEE) into its own regulations. In 2015, BSEE also formally recognized COS as the first and only organization with the authorization to accredit Audit Service Providers who conduct the BSEE-required SEMS audits, which are required for all offshore oil and gas operators.

In addition to the COS activities, more than 100 standards have been developed or enhanced since 2010 for well design, blowout prevention equipment, worker safety and other elements of exploration and production.<sup>51</sup>

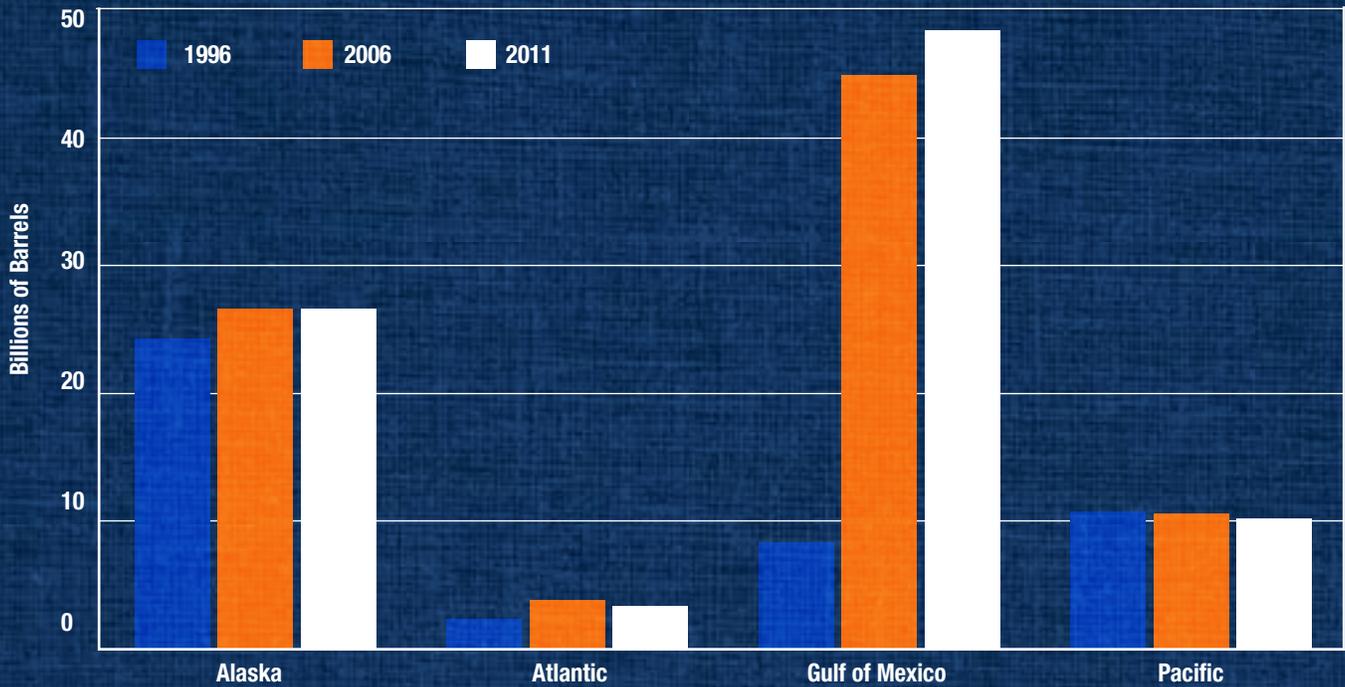
Among the actions taken to ensure effective response in the rare event of an incident is a requirement that advanced systems for capping wells at the ocean floor are now pre-positioned in ports on the Gulf of Mexico, ready to be deployed immediately.

After systematic efforts to examine and improve every aspect of operations, offshore oil and natural gas development is safer than ever.<sup>52</sup> The industry has the commitment and processes in place to build on that progress and move closer to the goal of zero accidents while expanding America's energy security and global energy leadership.



**After systematic efforts to examine and improve every aspect of operations, offshore oil and natural gas development is safer than ever and closer to the goal of zero accidents.**

## Oil – Undiscovered Technically Recoverable Resources of the Outer Continental Shelf



Source: BOEM

Unlike coastal areas in the Atlantic and Eastern Gulf of Mexico, the Western Gulf of Mexico is open to energy development. Safe exploration there contributes 54 percent of U.S. crude oil production – alongside a thriving tourism industry.



TOURISM INDUSTRY JOBS

**600,000**



ANNUAL TOURISM REVENUE

**\$20 BILLION**



BEACHGOERS ANNUALLY

**15.2 MILLION**

Texas - **“ENERGY PRODUCING NATIONS FROM AROUND THE WORLD LOOK TO TEXAS TO SEE HOW OUR STATE’S POLICIES PROTECT THE ENVIRONMENT WHILE ALLOWING OIL AND NATURAL GAS ACTIVITY TO GROW JOBS AND BOLSTER OUR ENERGY SECURITY.”**

- Todd Staples, Texas Oil & Gas Association

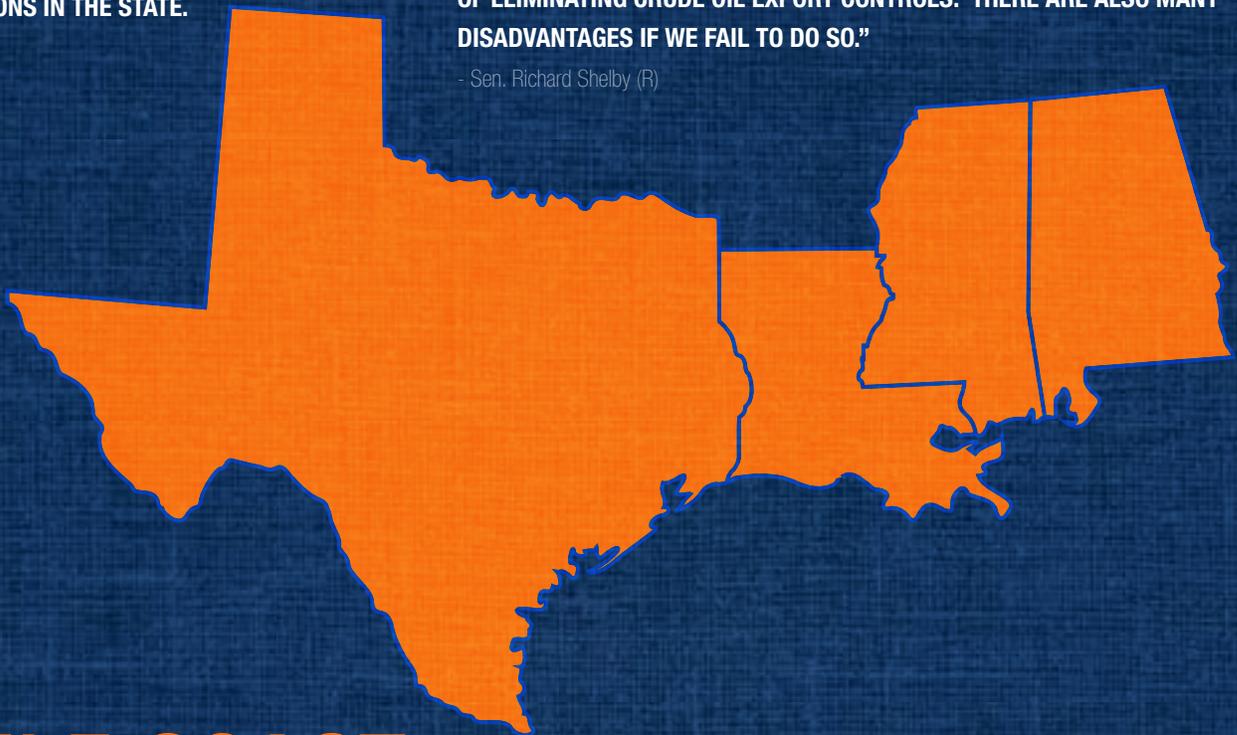
Louisiana - **IN 2014 THE LOUISIANA GOVERNMENT NETTED \$1.2 BILLION IN REVENUE FROM OIL AND GAS OPERATIONS IN THE STATE.**

Mississippi - **“THIS NEW [OZONE] RULE IS A SOLUTION IN SEARCH OF A PROBLEM... I DO NOT BELIEVE THAT EPA CAN SCIENTIFICALLY DEMONSTRATE THAT THIS RULE COULD HAVE ANY HEALTH BENEFITS FOR AMERICANS.”**

- Sen. Roger Wicker (R)

Alabama - **“MANY AGREE THAT LIFTING THIS BAN WILL GIVE THE UNITED STATES ECONOMY SUBSTANTIAL BENEFITS INCLUDING INCREASED ENERGY PRODUCTION AND INVESTMENT, PUBLIC REVENUE, AND TRADE AND ENERGY SECURITY. STUDIES HAVE ALSO FOUND THAT IT WILL LEAD TO AN INCREASE IN JOBS AND WILL HELP DECREASE GASOLINE PRICES AT THE PUMP. IN ADDITION, THERE ARE MANY GEOPOLITICAL ADVANTAGES OF ELIMINATING CRUDE OIL EXPORT CONTROLS. THERE ARE ALSO MANY DISADVANTAGES IF WE FAIL TO DO SO.”**

- Sen. Richard Shelby (R)



## GULF COAST

RECENT POLL OF VOTERS FOUND:

81%

BELIEVE U.S. GOVERNMENT REGULATIONS CAN CONTRIBUTE TO INCREASED COSTS FOR GASOLINE TO CONSUMERS

74%

ARE CONCERNED ABOUT GOVERNMENT REQUIREMENTS FOR HIGHER ETHANOL BLENDS

79%

SUPPORT OFFSHORE DRILLING FOR OIL AND NATURAL GAS

68%

SUPPORT EXPORTING NATURAL GAS AND OIL TO OUR ALLIES

# Gulf Coast | Fueling America

## A Vital Component of the Energy Renaissance

America's world-leading refineries are a strategic national asset and a vital component of the energy renaissance. State-of-the-art refining facilities – with the majority of their production capacity located in the Gulf Coast region<sup>53</sup> – have steadily increased capacity to keep pace with growing demand, reaching the highest capacity in nearly 35 years in 2015.<sup>54</sup>

Although no new refineries with significant capacity have been constructed in nearly 40 years,<sup>55</sup> investments to increase capacity and utilization within existing refineries have ensured the refining sector continues to provide the gasoline, jet fuel, diesel fuel, home heating oil and petrochemicals that Americans rely on. Medications, clothing, fertilizer, construction and automotive materials, medical equipment and plastics – countless items essential to the American economy and everyday life – are derived from refined petroleum products.

The refining industry supplies the over 130 billion gallons of gasoline<sup>56</sup> and 60 billion gallons of diesel<sup>57</sup> per year that fuel trucks, barges, ships and trains that bring us food, household goods and electronics while allowing Americans to travel to work, go on vacation, visit family and friends, and enjoy all the health and safety benefits of modern living made possible by energy.

The Gulf Coast region is also poised to expand its crucial role as an export hub. Long staples of America's oil and natural gas production, Gulf states could soon be at the center of a new era in American energy leadership. The ability of U.S. refineries to supply 100 percent or more of our domestic needs for so many petroleum products has allowed the U.S. to become a net



product exporter. The U.S. is the world's largest exporter of petroleum products,<sup>58</sup> and refined products are the top U.S. export by value.<sup>59</sup> The expansion of exports of liquefied natural gas (LNG) represents additional opportunity for economic growth. Natural gas production has increased so significantly, courtesy of the hydraulic fracturing revolution, that Gulf Coast import facilities are converting to LNG export terminals. After surmounting numerous bureaucratic hurdles, a number of LNG export terminals are under construction and set to begin exports to American allies within months. Expediting the approval process for LNG export facilities will further strengthen America's position as a global energy superpower while bringing significant economic growth to Gulf Coast states and the nation.

### Refineries Keep America Running

The U.S. refining industry supports over 1.2 million jobs for highly skilled American workers across the country.<sup>60</sup> Jobs directly within the industry or in the supply chain earn twice the national average.

The nation's 140 operable refineries<sup>61</sup> are among the most technologically advanced in the world. U.S. refineries invest billions of dollars each year to make cleaner fuels, enhance operational efficiency and meet stringent air quality standards. Between 1990 and 2013, U.S. refiners expended \$149 billion on environmental improvements<sup>62</sup> – contributing to a 69 percent reduction since 1970<sup>63</sup> in the six criteria air pollutants while population, energy use and GDP have all increased.

Over the last 12 years, refiners have removed 90 percent of sulfur from gasoline<sup>64</sup> and implemented an ultra-low sulfur diesel standard across the entire nation.<sup>65</sup> When used in modern vehicles, the cleaner fuels produced by the refining industry have contributed to emission reductions from the nation's vehicles by over 99 percent since the 1970s.<sup>66</sup>

Chevron's refinery in Pascagoula, Miss., is just one example of many that illustrates the industry's technological innovation and commitment to community.<sup>67</sup>

# Gulf Coast | Fueling America

A Vital Component of the Energy Renaissance

U.S. REFINERIES INVESTED

**\$149  
BILLION**

(BETWEEN 1990-2013)  
CONTRIBUTING TO  
ENVIRONMENTAL  
IMPROVEMENTS

Source: API: Environmental Expenditures  
by the U.S. Oil and Natural Gas Industry,  
1990-2014

**69%**

REDUCTION SINCE  
1970 IN THE SIX CRITERIA  
AIR POLLUTANTS WHILE  
POPULATION, ENERGY USE AND  
GDP HAVE ALL INCREASED

The refining industry has contributed to emission reductions from the nation's vehicles by over 99 percent since the 1970s.

The 52-year-old refinery is the 11<sup>th</sup> largest in the nation, and Chevron continues to invest in technologies to save water, conserve energy and reduce emissions while partnering with the Nature Conservancy and the Audubon Society. The refinery implemented a Clean Fuels project in 2003 to improve its manufacture of ultra-low-sulfur diesel. In 2009, Chevron built a new water treatment facility to recycle and return water used in refining processes to the Pascagoula River. In all, Chevron has spent \$44 million in the past 20 years to achieve environmental progress while contributing more tax revenue than the next nine county taxpayers combined.

### Regulatory Challenges for Refiners

Regulatory uncertainty and government mandates that ignore market realities and the tremendous environmental progress to date represent major challenges to the refinery sector's ability to continue to provide the fuels and feedstock for other products Americans need.

New refinery sector emissions rules finalized in 2015 could cost refiners up to \$1 billion to implement. Under voluntary programs and in compliance with existing regulations, companies have already invested billions of dollars to reduce emissions by installing flare gas recovery and flare minimization systems. EPA analyses, supported by extensive industry monitoring data, show that these efforts are working. Air emissions from refineries are already at safe levels, and air quality will continue to improve. Implementing the

new regulations – without regard for these improvements – could result in added costs for delivering affordable energy to U.S. consumers.<sup>68</sup>

The Renewable Fuel Standard (RFS) remains an ongoing source of uncertainty for refiners and potential economic harm for consumers. The EPA's repeated failure to meet its statutory deadline<sup>69</sup> for finalizing yearly biofuel volume requirements has generated significant uncertainty for refiners and contributed to market volatility for Renewable Identification Numbers, or RINs, the federal credits refiners use to demonstrate compliance for blending renewable fuels.<sup>70</sup>

In November 2015, the agency released ethanol volume mandates for 2014, 2015 and 2016.<sup>71</sup> Although EPA used its authority to waive down ethanol mandates below the targets set by the 2007 law, continued implementation of the RFS as written threatens an inevitable collision with the blend wall – the point at which the RFS requires blending more ethanol into the gasoline supply than can be used as E10 (10 percent ethanol volume) by the vehicle fleet.<sup>72</sup>

EPA's latest volume mandates are based on assumptions that refiners can accommodate rising volume requirements by producing greater quantities of higher ethanol fuel. However, 90 percent of vehicles are not approved by manufacturers to use fuel blends higher than E10.<sup>73</sup> Extensive testing by the Coordinating Research Council found that E15 fuel blends can cause damage to engines and fuel systems<sup>74</sup> that automakers warn may not be covered by warranty.<sup>75</sup> As for E85, only 6 percent of the current vehicle fleet can use

## WAS YOUR VEHICLE DESIGNED TO OPERATE ON E15?

Auto Manufacturer Statements on E15 Use in Non-Flex Fuel Vehicle Models (January 2016).  
Most vehicles on the road today aren't recommended for operating on E15 by manufacturers.

| MANUFACTURER      | MODEL YEAR |      |      |      |      |      |      |      |      |      |      |      |      |                   |                   |                   |
|-------------------|------------|------|------|------|------|------|------|------|------|------|------|------|------|-------------------|-------------------|-------------------|
|                   | 2001       | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014              | 2015              | 2016              |
| BMW               | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No                | No                | No                |
| Chrysler          | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No                | No                | Most <sup>6</sup> |
| Ford              | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | Yes  | Yes               | Yes               | Yes               |
| GM                | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | Yes  | Yes  | Yes               | Most <sup>4</sup> | Most <sup>4</sup> |
| Honda/Acura       | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | Some <sup>1</sup> | Yes               | Yes               |
| Hyundai/Kia       | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No                | No                | No                |
| Jaguar/Land Rover | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | Yes               | Yes               | Yes               |
| Mazda             | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No                | No                | No                |
| Mercedes          | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No <sup>2</sup>   | No <sup>2</sup>   | No                |
| Mitsubishi        | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No                | No                | No                |
| Nissan/Infiniti   | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No                | No                | No                |
| Subaru            | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No                | No                | No                |
| Toyota/Lexus      | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | Some <sup>3</sup> | Most <sup>5</sup> | Most <sup>5</sup> |
| VW/Audi/Porsche   | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | Yes               | Yes               | Yes               |
| Volvo             | No         | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No   | No                | No                | No                |

Source: <http://www.edmunds.com/ownership/howto/articles/120189/article.html> and auto company contacts

<sup>1</sup>Accord, Civic, Crosstour, CR-V, CR-Z, Insight, Odyssey, Pilot; Acura: ILX, MDX, RDX, RLX, but not TL, TSX, TSX Wagon

<sup>2</sup>Some owner manuals for 2014 and 2015 incorrectly stated that E15 was allowed.

<sup>3</sup>Avalon, Camry, Corolla, Highlander, iQ, Prius, RAV-4, Scion iC, Sienna, Venza; Lexus: CT200H, ES350, GS300/350, GS450H, IS250, IS350, LS460, RX350, RX450H, but not 4Runner, FJ Cruiser, Land Cruiser, Sequoia, Tacoma, Tundra, Yaris; Lexus: IS250C, IS350C, IS F, GX460, LX570

<sup>4</sup>Not Chevrolet City Express

<sup>5</sup>Not FR-S, xB (model discontinued after 2015).

<sup>6</sup>Not Dodge Viper

it<sup>76</sup> and demand has remained miniscule with annual volume in 2014 equivalent to less than a tenth of 1 percent of annual gasoline demand.<sup>77</sup> Drivers reject the fuel in part because it is less energy dense than gasoline; a gallon of E85 gasoline will not drive your car as far.<sup>78</sup>

A 2014 Congressional Budget Office study noted the problem and projected rising fuel prices, stating, “Given the design of the RFS, the cost of encouraging additional sales of high-ethanol fuel falls on the producers and consumers of gasoline and diesel.”<sup>79</sup> Unless EPA reconciles ethanol mandates

with these market realities, a 2015 study by NERA Economic Consulting projects “severe economic harm.” To avoid risking damage to vehicles not compatible with ethanol blends higher than E10, refiners could be forced to reduce their RIN obligations by decreasing volumes of the nation’s gasoline and diesel supplies by as much as 30 percent – with spillover effects that ripple through the transportation sector and overall economy.<sup>80</sup>

The American energy resurgence has accomplished many of the goals the RFS was designed to achieve, from falling import levels to lower gasoline prices to emissions

**As for E85,**  
**only 6 percent**  
of the current  
vehicle fleet  
can use it,  
and demand  
has remained  
miniscule.

# Gulf Coast | Fueling America

## A Vital Component of the Energy Renaissance

reductions courtesy of cleaner-burning natural gas. Reducing the total renewable fuels volume requirement to reflect market realities could prevent significant economic harm, avert supply disruption and preserve the availability of ethanol-free fuels that consumers demand.

### Global Energy Leadership

The United States has a valuable, historic opportunity to capitalize on our position as the world's leading producer of oil and natural gas<sup>81</sup> by exporting a portion of our abundant resources. Natural gas production increased by 36 percent since 2005,<sup>82</sup> and the U.S. Energy Information Administration (EIA) projects the United States will become a net exporter by 2017.<sup>83</sup> Updating federal export policy to match America's 21<sup>st</sup> century energy reality promises major economic and geopolitical benefits.

### America's LNG Opportunity

Harnessing the economic and energy security potential of LNG exports involves overcoming federal obstacles. Applications to export LNG to non-free trade agreement nations – including Eastern European allies dependent on Russia for up to 100 percent of natural gas supply<sup>84</sup> – must be approved by the Department of Energy, and facility environmental reviews must be completed by the Federal Energy Regulatory Commission (FERC) or the Maritime Administration, in a process that can take years. LNG exports could contribute up to 452,000 jobs, add up to \$74 billion in annual GDP growth and generate as much as \$40 billion in government revenue between 2016 and 2035, according to a 2013 study by ICF International.<sup>85</sup>

Even some non-producing states could see economic gains as high as \$2.6 billion to \$5 billion due to demand for steel, cement, equipment and other goods used in natural gas development.<sup>86</sup> A 2012 Energy Department-commissioned study by NERA Economic Consulting projected net economic gains across all export-level scenarios,<sup>87</sup> with the updated 2014 version further confirming “the greater the level of exports, the greater the benefits.”<sup>88</sup>

Multiple studies find that higher export levels stimulate even more production, thus dispelling concerns that LNG exports could jeopardize low prices here at home. A 2014 Columbia University study found that the global supply increase resulting in large part from U.S. LNG exports “will allow for more competition in the global market, putting downward pressure on prices and giving gas-importing nations more leverage with traditional suppliers.”<sup>89</sup>

U.S. allies from around the world have repeatedly implored U.S. officials for greater access to American energy. In a letter to Congress, Eastern and Central European ambassadors wrote, “Energy security is not only a day-to-day issue for millions of citizens in our region, but it is one of the most important security challenges that America's allies face in Central and Eastern Europe today.”<sup>90</sup> While more than 48 competing LNG export projects are currently planned or under construction in other nations,<sup>91</sup> the Department of Energy has granted final approval to fewer than 10 U.S. facilities in four years, and nearly 30 applications remain pending.<sup>92</sup> Faster approval promises to generate thousands of jobs, add billions in economic activity to communities around the country and support American security interests around the world.

## Estimated Income Contribution of Increased LNG Exports by 2035 (in billions)

|               |        |
|---------------|--------|
| TEXAS         | \$31.4 |
| LOUISIANA     | \$16.2 |
| PENNSYLVANIA  | \$10.3 |
| ALASKA        | \$10.0 |
| OHIO          | \$5.1  |
| CALIFORNIA    | \$5.0  |
| NEW YORK      | \$3.3  |
| ARKANSAS      | \$3.1  |
| ILLINOIS      | \$2.6  |
| INDIANA       | \$2.2  |
| OKLAHOMA      | \$2.2  |
| MICHIGAN      | \$2.0  |
| FLORIDA       | \$1.9  |
| COLORADO      | \$1.8  |
| WEST VIRGINIA | \$1.7  |
| OREGON        | \$1.7  |
| MARYLAND      | \$1.6  |
| MISSISSIPPI   | \$1.5  |
| GEORGIA       | \$1.4  |
| NEW JERSEY    | \$1.4  |
| VIRGINIA      | \$1.3  |
| MASSACHUSETTS | \$1.2  |
| TENNESSEE     | \$1.2  |
| UTAH          | \$1.1  |
| N. CAROLINA   | \$1.1  |

## SAFETY FIRST

When it comes to worker safety, the refining industry injury rate has been steadily decreasing. In fact, refinery employees are four times less likely to be injured on the job than employees in other manufacturing sectors, and job-related injury and illness rates at refineries have declined 42 percent since 2003, according to Bureau of Labor Statistics data.<sup>93</sup>

API has developed and maintains more than 200 refining safe operating standards and safe work practices. Over the last 10 years, API has published over 180 new editions of its refining safety standards and recommended practices – new versions that reflect the latest science, technologies and enhanced practices and procedures. The refining industry has invested, and continues to invest, significant resources at both the individual company and industry levels to improve safety performance.

### Examples of these investments include:

- Developing new and updating existing refinery safety standards and practices
- Sponsoring efforts to advance and share new/improved technologies, practices and procedures
- Implementing leading and lagging metrics programs to enhance the process safety performance and reduce risk
- Conducting industry technical forums and providing other mechanisms to share lessons-learned from incidents and near misses
- Evaluating industry safety data to identify performance improvement opportunities
- Offering a service that uses qualified, highly experienced third-party assessors to evaluate and provide feedback on plant process safety systems – topics analyzed include leadership, mechanical integrity, operating practices and facility siting



Washington - **ALTHOUGH NOT A CRUDE OIL-PRODUCING STATE, WASHINGTON RANKED FIFTH IN THE NATION IN CRUDE OIL-REFINING CAPACITY IN 2015.**

Oregon - **NATURAL GAS IS OREGON'S SECOND LARGEST SOURCE OF ENERGY. THE MIST FIELD IN NORTHWESTERN OREGON IS THE ONLY PRODUCING NATURAL GAS FIELD IN THE PACIFIC NORTHWEST.**

California - **"UNDER THE CORN ETHANOL MANDATE IN THE RFS, ROUGHLY 44 PERCENT OF U.S. CORN IS DIVERTED FROM FOOD TO FUEL, PUSHING UP THE COST OF FOOD AND ANIMAL FEED AND DAMAGING THE ENVIRONMENT. OIL COMPANIES ARE ALSO UNABLE TO BLEND MORE CORN ETHANOL INTO GASOLINE WITHOUT CAUSING PROBLEMS FOR AUTOMOBILES, BOATS, AND OTHER VEHICLES."**

- Sen. Dianne Feinstein (D)

Hawaii - **"WE HEAR A LOT OF STORIES ABOUT FOLKS WHO DON'T GET GOOD MILEAGE WITH THIS FUEL MIX SO THEY SPEND MORE IN THE LONG TERM TO GET WHERE THEY WANT TO GO."**

- State Rep. Chris Lee (D)



## PACIFIC

RECENT POLL OF VOTERS FOUND:

65%

ARE CONCERNED ABOUT GOVERNMENT REQUIREMENTS FOR HIGHER ETHANOL BLENDS

67%

OPPOSE HIGHER TAXES THAT COULD DECREASE ENERGY PRODUCTION

79%

BELIEVE U.S. GOVERNMENT REGULATIONS CAN CONTRIBUTE TO INCREASED COSTS FOR GASOLINE TO CONSUMERS

80%

AGREE THAT INCREASED ACCESS COULD HELP CREATE JOBS

# Pacific | Energy Policy Hits Home

## Economic Growth Potential of Crude Exports

Energy opportunities – both squandered and emerging – abound in Pacific Coast states. Oregon, with its LNG export facilities, and California, with its strong manufacturing base, are primed to reap the rewards of economic growth generated by LNG and crude oil exports.

Yet state and local policies often prevent the advantages of the American energy resurgence from reaching West Coast residents. Despite promising reserves offshore and in the Monterey shale formation, California oil production has dropped 27 percent<sup>94</sup> since 2001. Due to the state's failure to embrace and promote hydraulic fracturing,<sup>95</sup> the Golden State is sacrificing the economic and employment growth enjoyed by other states.<sup>96</sup>

Pacific states are largely missing out on plunging gasoline prices enjoyed elsewhere. While most states experienced Thanksgiving 2015 gas prices averaging \$2.07 – the lowest level since 2008 – the top five most expensive gas markets were all Western states (Alaska, California, Nevada, Hawaii and Washington).<sup>97</sup> State motor fuel taxes in Hawaii, Washington and California rank among the top 10 rates in the nation,<sup>98</sup> but taxes alone are not responsible for driving up gas prices relative to those of other states. Stringent fuel regulations and burdensome refinery restrictions have helped drive California fuel prices to roughly \$1.00 above the national average, and a carbon cap-and-trade program fully implemented in 2015 threatens to send retail gas prices soaring by an additional 16 cents to 76 cents a gallon, according to analysis by the Western States Petroleum Association.<sup>99</sup> At great cost to family budgets and state economies, the

Pacific region demonstrates the consequences of poor policy choices and underscores the outsized influence energy policy exerts on economic growth, job creation and household savings. Like the nation as a whole, Pacific states can welcome major economic benefits by harnessing energy development opportunities. Also like the nation as a whole, smart energy policy must come first.

### Seizing the Moment on Exports

Although the United States leads the world in oil and natural gas production,<sup>100</sup> federal policy poses obstacles to fully capitalizing on our position as a global energy superpower. Crude export restrictions enacted in the 1970s during a time of energy scarcity have no place in our new energy reality. Free trade for crude oil and timely approval of LNG export applications are essential to ensure the United States does not cede our advantage as a leading producer.

### Crude Exports Promise Economic Growth

U.S. crude oil production increased 74 percent between 2008 and 2014, surging from 5 million barrels per day to an average 8.7 million barrels per day in 2014,<sup>101</sup> with 2015 average production well over 9 million barrels per day.<sup>102</sup> Numerous studies from a variety of sources across the ideological spectrum project significant benefits associated with lifting the decades-old ban on U.S. crude exports. A 2014 study by ICF International and EnSys Energy projects that lifting trade restrictions on crude oil could add up to 300,000 jobs to the U.S. economy, reduce the trade deficit by \$22 billion in 2020, and save American consumers



an average \$5.8 billion per year in gasoline, heating oil and other fuel costs.<sup>103</sup> Due to the industry's extensive supply chain, states with significant manufacturing and consumer spending stand to gain thousands of jobs and billions in economic growth even if they are not major energy producers.<sup>104</sup>

Every major economic study agrees that crude exports will put downward pressure on U.S. gasoline prices by adding greater stability to the global supply. A U.S. Energy Information Administration (EIA) report released in September 2015 states, "Petroleum product prices in the United States, including gasoline prices, would be either unchanged or slightly reduced by the removal of current restrictions on crude oil exports."<sup>105</sup>

Consistent with the majority of studies, EIA projects increases in domestic crude oil production will follow if U.S. producers are allowed greater access to world markets. The ability to export crude oil will also address what a Rice University study calls a "binding constraint" whereby export restrictions lead to discounted prices for domestic light crude oil compared to global crude prices.<sup>106</sup>

# Pacific | Energy Policy Hits Home

## Economic Growth Potential of Crude Exports



**U.S. crude oil production increased 74 percent** between 2008 and 2014, surging from 5 million to 8.7 million barrels per day.

The bulk of U.S. production growth comes from lighter crudes while the majority of refining capacity is geared to process heavier crudes. Allowing an outlet for America's bounty of light crude is essential to maintaining the nation's competitive advantage and to sustaining economic growth. In a low-price environment, "the difference between world prices and U.S. prices can be the difference between the viability and non-viability of a great deal of investment," according to IHS Vice Chairman Daniel Yergin.<sup>107</sup>

As with LNG exports, the export of American crude oil can serve as a powerful geopolitical tool. U.S. allies continue to petition for access to U.S. crude resources, and numerous experts cite security benefits as an advantage of changing our export policy. According to Michèle Flournoy, former undersecretary for policy at the Department of Defense under President Obama: "The United States is stronger and more secure when our allies are energy secure and economically vital. We are also stronger when we have lucrative and mutually beneficial energy trade with allies."<sup>108</sup>

A study examining state-by-state benefits finds that California is one of nine states that could realize over \$1 billion in state economic gains in 2020 and one of eight states that could add more than 10,000 jobs from crude exports.<sup>109</sup> Not only is California a major oil producer,<sup>110</sup> but its manufacturing sector's contributions to the energy supply chain and the level of consumer savings it can expect from lower fuel prices combine to rank it among top beneficiaries of crude oil exports.

### West Coast LNG Opportunities

With the right export policies, states need not be major energy producers to join the American energy resurgence. Thanks to two pending LNG export terminals, Oregon is poised to seize a substantial advantage in the global race to supply the Asian LNG market.<sup>111</sup> In addition to creating hundreds of construction jobs and generating significant economic activity, the Jordan Cove facility at Coos Bay<sup>112</sup> and the Oregon LNG terminal at Warrenton<sup>113</sup> promise to spread economic benefits across multiple Western natural gas-producing states. In a letter to FERC, 14 U.S. House and Senate members from Colorado, Utah and Wyoming stated: "FERC has already given eastern and Gulf coast states the opportunity to access overseas markets. We believe it should give Rocky Mountain states and Indian tribes the same opportunity."<sup>114</sup> Although natural gas demand in Asia has fluctuated along with the continent's economies, world competition to supply projected demand is fierce. Some projections indicate Asia will account for between 39 percent to half of incremental growth in global LNG demand through 2035.<sup>115</sup> With more than 48 competing LNG export projects planned or under construction in other nations, timing is everything if the United States is to capitalize on our status as the world's leading natural gas producer and claim our maximum potential share of that market. Despite missed opportunities at the local and state levels, with the right policy choices, Pacific states can still play a pivotal role in cementing America's global energy leadership – and reap the economic benefits.

#### The Wide-Ranging Impacts of Energy Policy: RFS

A variety of federal and state factors influence fuel options and prices, but federal ethanol policy stands out for the sheer scope of business and consumer interests it threatens. In addition to challenges for refiners and drivers detailed in the Gulf Coast chapter, the Renewable Fuel Standard (RFS) poses potential risks to consumers on multiple fronts. And unlike some of the costly policies enacted by Pacific states, federal ethanol mandates have nationwide impact that vividly illustrates the connection between energy policy and consumers' daily lives.

In addition to the 90 percent of automobiles on the road today not manufacturer-approved to run on fuel with more than 10 percent ethanol (E10),<sup>116</sup> other engines can also be damaged by higher ethanol blends, including those in boats, motorcycles, classic cars, lawnmowers and outdoor equipment such as chain saws, generators and utility vehicles. Groups including the National Marine Manufacturers Association,<sup>117</sup> American Motorcyclist Association,<sup>118</sup> Historic Vehicle Association<sup>119</sup> and Outdoor Power Equipment Institute<sup>120</sup> have all warned consumers about the dangers of using higher ethanol blends. Tellingly, the California Air Resources Board has not approved the sale of E15 in California, the nation's largest fuel market, because of concerns about potential engine damage.<sup>121</sup> Food and meat producers are also speaking out about damaging ethanol mandates. Ethanol production has diverted nearly 40 percent of the U.S. corn crop from food to fuel, leading to a 25 percent increase in the consumer price index for food since 2005.<sup>122</sup> The National

Chicken Council, American Meat Institute, National Council of Chain Restaurants (NCCR), and the Grocery Manufacturers Association have all protested RFS-driven higher costs for their businesses and customers. In a joint press conference calling for action, NCCR Executive Director Rob Green described the policy's ripple effect: "The Renewable Fuel Standard has wrought havoc on food retailers, chain restaurants, franchisees and operators, as well as food producers and suppliers. However, the ultimate losers are consumers."<sup>123, 124</sup>

As with many overreaching policies, the most vulnerable individuals suffer the greatest impact. Anti-hunger group ActionAid is a part of the coalition urging action, stating, "No one should go hungry to fill our gas tanks."<sup>125</sup> The organization is calling for reform to the "massive mandates backed by Congress" that their research indicates are "making food prices around the world much more volatile."<sup>126</sup>

Environmental groups are also taking action. Analysis of EPA data indicates corn-based ethanol yields 27 percent more greenhouse gases over its full lifecycle compared to regular gasoline.<sup>127</sup> A University of Michigan study concluded corn ethanol generates net greenhouse gas emissions nearly 70 percent higher.<sup>128</sup> The Environmental Working Group warned, "Implementation of the RFS has significantly increased greenhouse gas emissions when compared to emissions from gasoline, it has increased water pollution, increased the emission of criteria air pollutants and it has destroyed valuable habitat for wildlife."<sup>129</sup> Significant reform or repeal is necessary to prevent the widespread damage threatened by unrealistic ethanol mandates.

**With more than 48 competing LNG export projects internationally, timing is everything if the United States is to capitalize on our status as the world's leading natural gas producer.**

**Asia will account for between 39 percent to half of incremental growth in global LNG demand through 2035.**

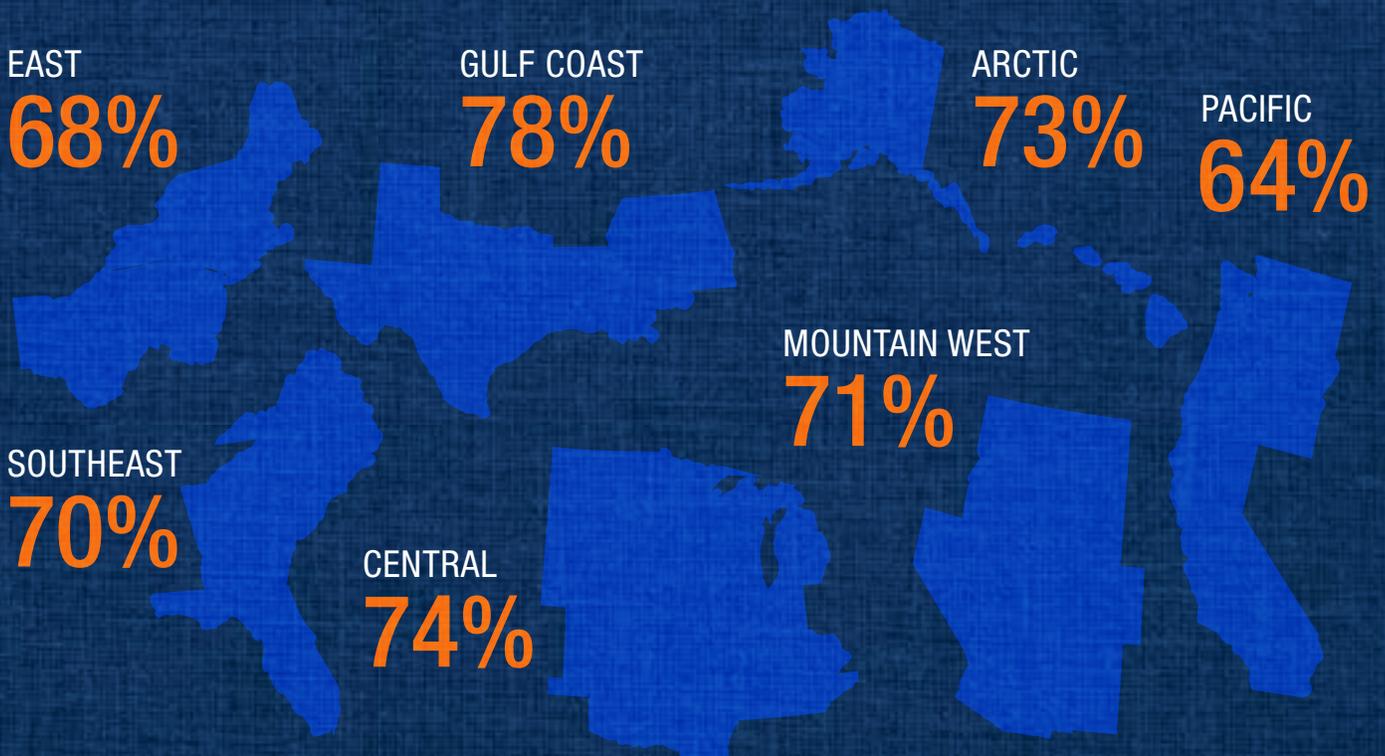
# WHAT AMERICA IS THINKING ON ENERGY ISSUES

## REGIONAL POLL RESULTS

One candidate has won the confidence of the American people heading into the 2016 election: American Energy. Democrats, Republicans and Independents may not agree on much, but strong majorities of all political parties are united in recognition that increased energy access can create jobs and grow the economy. A nationwide poll of registered voters confirms that energy is an important issue this election season.



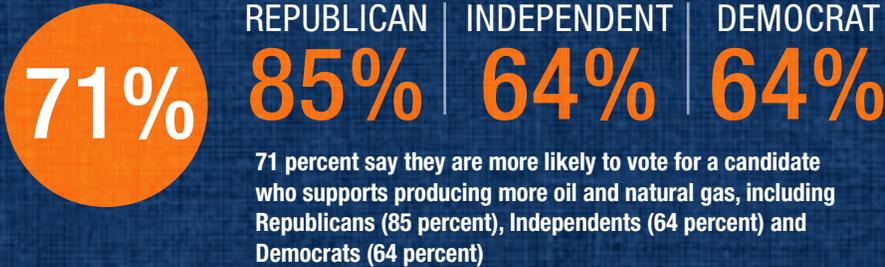
A MAJORITY OF VOTERS IN EVERY REGION ARE MORE LIKELY TO VOTE FOR 2016 CANDIDATES WHO SUPPORT PRODUCING MORE U.S. OIL AND NATURAL GAS.



# NATIONAL POLL RESULTS

Harris Poll, October 2015; 2,801 Registered Voters Nationwide

## SUPPORTING OIL & NATURAL GAS



Bipartisan majorities agree that increased access could help:

Create Jobs  
**86%**

Stimulate the Economy  
**84%**

Strengthen Energy Security  
**85%**

Lower Consumer Energy Costs  
**78%**

Make America a Global Energy Power  
**72%**

Bipartisan majorities also agree on the following specific policy choices:

Support increased development of the country's energy infrastructure  
**80%**

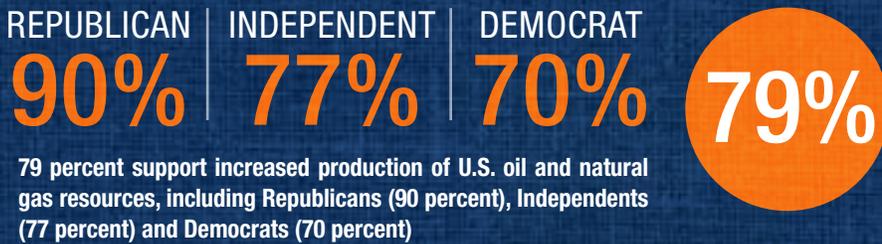
Oppose legislation that could increase the cost of oil and natural gas operations  
**74%**

Oppose higher taxes that could decrease energy production  
**66%**

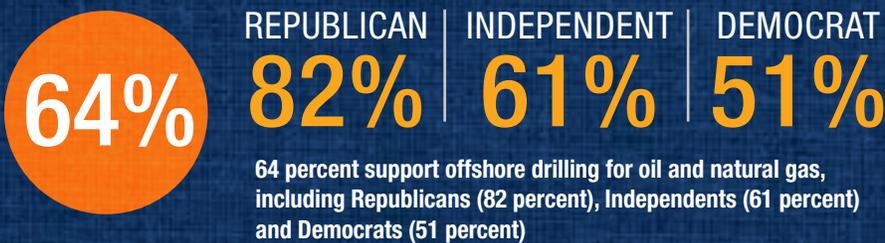
Believe U.S. government regulations can contribute to increased costs for gasoline to consumers  
**75%**

Are concerned about government requirements for higher ethanol blends  
**72%**

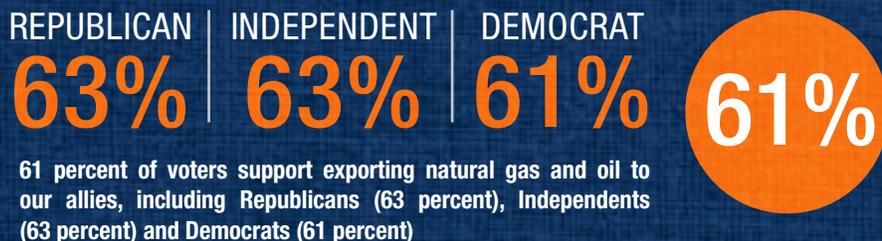
## PRODUCTION



## OFFSHORE



## EXPORTS



Alaska - **THE ARCTIC CONTAINS THE WORLD'S LARGEST REMAINING CONVENTIONAL, UNDISCOVERED OIL AND NATURAL GAS, ESTIMATED AT 13 PERCENT OF RECOVERABLE OIL AND 30 PERCENT OF RECOVERABLE NATURAL GAS RESOURCES.**

**"WE HAVE IN PLACE THE INFRASTRUCTURE FOR AN ADDITIONAL 1.5 MILLION BARRELS PER DAY OF OIL. INCREASED FLOW THROUGH THE TRANS-ALASKA PIPELINE SYSTEM WOULD MITIGATE MUCH OF THE STATE'S FISCAL CHALLENGES, ADD TO THE FEDERAL TREASURY AND GIVE THE UNITED STATES ENERGY INDEPENDENCE."**

- Gov. Bill Walker (I)



**"OUR PEOPLE AND OUR STATE NEED ACCESS TO THAT OIL AND GAS TO HEAT OUR HOMES AND BUILDINGS, POWER OUR SNOW MACHINES AND FOUR WHEELERS, AND EARN REVENUES TO SUPPORT OUR CORE COMMUNITY SERVICES."**

- State Rep. Ben Nageak (D)

# ARCTIC

RECENT POLL OF VOTERS FOUND:

91%

SUPPORT INCREASED DEVELOPMENT OF THE COUNTRY'S ENERGY INFRASTRUCTURE

84%

AGREE INCREASED ACCESS COULD HELP STRENGTHEN ENERGY SECURITY

82%

SUPPORT INCREASED PRODUCTION OF U.S. OIL AND NATURAL GAS RESOURCES

90%

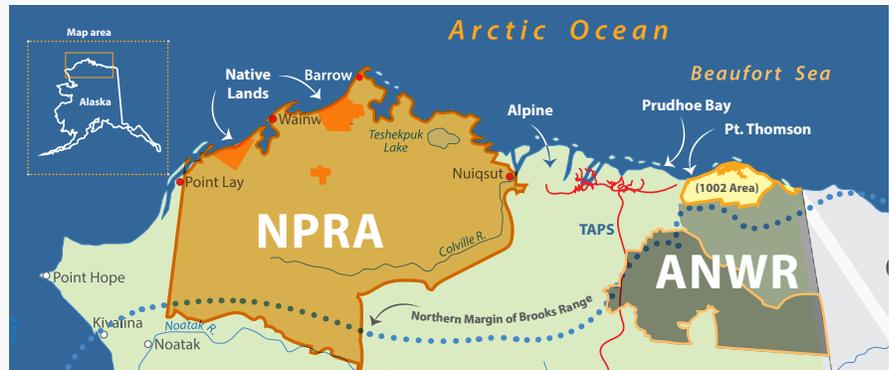
AGREE THAT INCREASED ACCESS COULD HELP CREATE JOBS

# Arctic | Energy Security

## Barriers to Development

Alaska is home to some of the largest oil and natural gas reserves in the United States. Oil production in the state's North Slope once supplied about a quarter of total U.S. oil output.<sup>130</sup> An estimated 30 percent of the nation's known recoverable offshore resources are in Alaska's waters.<sup>131</sup> However, 61 percent of Alaska's land is controlled by the federal government, which has erected one obstacle after another to energy development.<sup>132</sup> Even promising areas specifically established under federal policy as energy development zones remain largely off limits.

Oil and natural gas development is the backbone of Alaska's economy, supporting one-third of all state jobs and contributing more than \$6 billion in labor income.<sup>133</sup> Alaska oil and natural gas production has been a lifeline for the U.S. energy supply, offsetting much of the mid-1980s production declines experienced in the Lower 48 and transporting 17 billion barrels of oil through the Trans-Alaska Pipeline (TAPS) south to the Pacific coast.<sup>134</sup> Virtually all of that production took place on state and Native-owned lands. Yet the available geologic information strongly suggests that the resource potential in federal areas may far exceed the potential of state lands. Expanding access in resource-rich areas like the National Petroleum Reserve Alaska (NPR-A), small, designated areas in the Arctic National Wildlife Refuge (ANWR) and the Outer Continental Shelf (OCS) is vital not just for Alaska's economy but for our nation's long-term energy security.



Source: [http://www.blm.gov/ak/st/en/prog/energy/oil\\_gas/npra.html](http://www.blm.gov/ak/st/en/prog/energy/oil_gas/npra.html)

### Onshore Obstacles

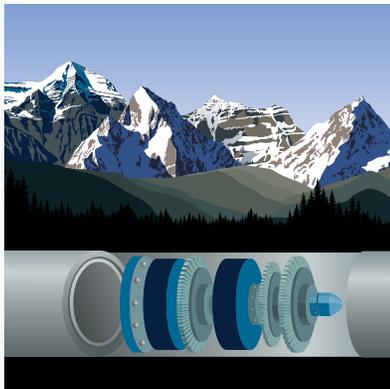
The NPR-A was created in 1923 as a dedicated oil reserve at a time when the U.S. Navy was converting the fleet from coal to oil.<sup>135</sup> Despite its specific designation as a strategic resource, little commercial oil and natural gas drilling has occurred there to date. According to U.S. Geological Society (USGS) estimates, 896 million barrels of oil and 53 trillion cubic feet of natural gas are located in the NPR-A.<sup>136</sup> Yet in 2012, the federal government announced it was placing roughly half of the reserve's 23 million acres off limits to development.<sup>137</sup> A BLM decision in October 2015 to allow ConocoPhillips' Greater Mooses Tooth Unit to move forward paves the way for the first production on federal NPR-A land in the century since it was first set aside for oil and natural gas development.<sup>138</sup> The permitting delays and regulatory uncertainty that have held up this project for years – constraining a much-needed economic development opportunity – are typical of the barriers Alaskans face in accessing their energy resources. Potentially abundant reserves are also locked away in ANWR. A portion of ANWR's Area 1002, located on the coastal plain, was set aside in 1980<sup>139</sup> for oil

and natural gas development that could produce between 4.3 billion and 11.8 billion barrels of oil, according to USGS estimates.<sup>140</sup> ANWR is about the size of South Carolina, and the land tracts targeted for development collectively equal about 2,000 acres – roughly the size of Dulles Airport. Despite the minimal possibility of impact to ANWR, decades of federal obstacles have prevented any development. A January 2015 recommendation from the Obama administration to place 12.28 million of ANWR's 19.8 million acres into wilderness status is yet another barrier to the energy development that Alaskans strongly support.<sup>141, 142</sup>

Alaska State Rep. Ben Nageak, a Democrat who was born in ANWR and is a member of the Iñupiat tribe, criticized the decision, stating, "Our native people have been extracting resources from our lands since time immemorial" and "have proven that we can and will act responsibly."<sup>143</sup> Locking up ANWR and the economic growth it promises, he says, "will permanently harm our people and all Alaskans," adding, "it's time the federal government quit tying our hands behind our backs."<sup>144</sup>

# Arctic | Energy Security

## Barriers to Development



## The Trans-Alaska Pipeline

has been a key component of America's energy infrastructure for decades.

That sentiment is echoed by Richard Glenn, executive vice president for Lands and Natural Resources of Arctic Slope Regional Corporation, which represents the business interests of about 12,000 Arctic Slope Iñupiat. In Congressional testimony in 2015, Glenn stated, “The development of oil and gas resources in our region has fostered a stable local tax base that provides local education and community improvements that would otherwise be lacking or furnished at great expense by the federal government and other agencies.”<sup>145</sup>

The partnership between local Native communities and producers of oil and natural gas has been integral to both economic transformation and cultural preservation. Glenn explains: “The development of Arctic oil and gas resources provides our communities with the means to preserve our traditional way of life and culture while also allowing our residents to enjoy a greater quality of life. Put another way, our communities cannot survive without continued resource development in our region.”

The combined impact of so many federal restrictions threatens “to starve our Trans-Alaska Pipeline System of new oil,” according to Sen. Lisa Murkowski (R-Alaska).<sup>146</sup> TAPS has been a key component of America's energy infrastructure for decades, supporting jobs and contributing to energy security. Each missed energy opportunity poses a risk to TAPS.<sup>147</sup> Declining production already creates challenges and increases costs for safe operation, and there could be a time when oil production is so low that the pipeline can no longer be operated cost-effectively. Removing federal restrictions to allow further development in federal areas on

the North Slope and offshore is essential to maintaining Alaska's economy and the viability of a pipeline that plays a critical role in America's energy security.

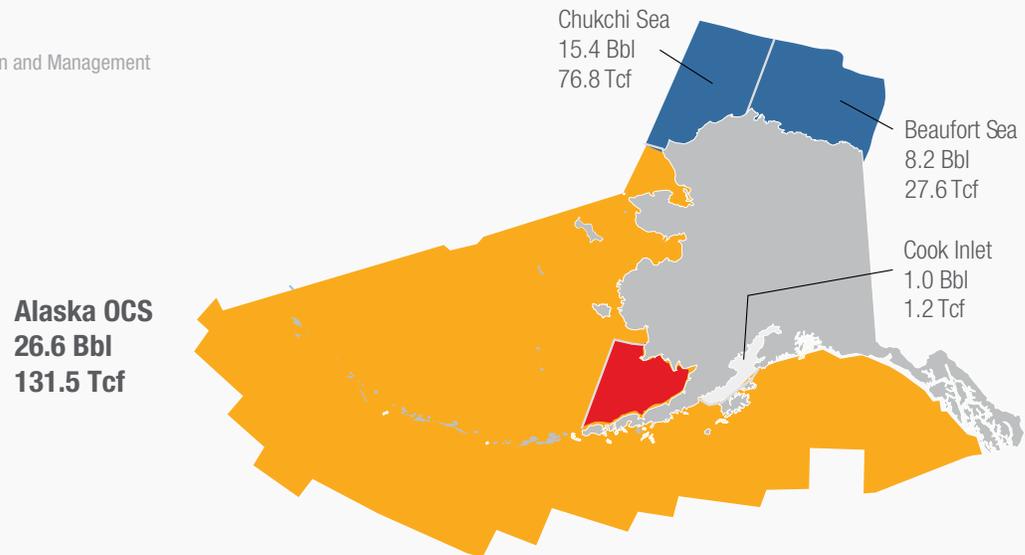
### Arctic Potential

Failure to harness the energy potential in the Alaska offshore region today could have significant consequences for the nation's long-term energy security. The world's largest remaining conventional, undiscovered oil and natural gas reserves – estimated at 13 percent of recoverable oil and 30 percent of recoverable natural gas resources – await development in the Arctic. Estimates indicate the Beaufort and Chukchi seas have more technically recoverable oil and natural gas than the Atlantic and Pacific coasts combined – with the Chukchi Sea alone home to 29.04 billion barrels of oil equivalent, according to 2006 government estimates.<sup>148</sup> A 2011 study by the Anchorage firm Northern Economics projects that developing resources in the Beaufort and Chukchi seas could generate as many as 50,000 jobs nationwide.<sup>149</sup>

Although about 700 leases have sold for offshore oil and natural gas exploration in Alaska since 2005 – generating billions in revenue for the federal government<sup>150</sup> – only one well has been drilled to production depth due largely to delays and continually changing restrictions imposed by the federal government. Seven years of repeated federal obstacles elapsed before Royal Dutch Shell was allowed to proceed with drilling a single exploratory well in 2015. The company's decision to discontinue the project was

### Alaska Offshore Potential

Source: The Bureau of Ocean Exploration and Management (BOEM) - <http://www.boem.gov>



based partly on the well's output, but Shell also cited the "challenging and unpredictable federal regulatory environment in offshore Alaska" in its decision.<sup>151</sup>

Interior Secretary Sally Jewell has stated, "The Arctic is an important component of the administration's national energy strategy, and we remain committed to taking a thoughtful and balanced approach to oil and gas leasing and exploration offshore Alaska."<sup>152</sup>

Recent history does not demonstrate the balanced, forward-looking approach necessary to fulfill the potential of Arctic energy. Four Chukchi and Beaufort sea lease sales that were included in the 2007-2012 Leasing Program and proposed to take place between 2009 and 2012 were canceled. Only three lease sales were included in the 2012-2017 Leasing Program, and the Interior Department announced in October 2015 that it would cancel those and deny lease extension requests.<sup>153</sup>

Only one lease sale each for the Beaufort and Chukchi seas has been proposed for the 2017-2022 Leasing Program. Collectively, the decisions represent a system of regulatory and permitting unpredictability and uncertainty that continues to undermine investment decisions. Regulatory certainty combined with routine opportunities for leasing are necessary to secure the promise of Alaskan oil and natural gas production in federally controlled areas.

To boost American energy security in the coming decades, development in the Arctic must begin right away. According to a report from the National Petroleum Council, "Given the resource potential, and long timelines required to bring Arctic resources to market, Arctic exploration today may provide a material impact to U.S. oil production in the future, potentially averting decline, improving U.S. energy security, and benefitting the local and overall U.S. economy."<sup>154</sup>

Decades of experience operating in Arctic environments – most notably at Prudhoe Bay and across Alaska's North Slope – demonstrates the oil and natural gas industry has the technology and expertise to safely develop Arctic offshore resources.

Russia, Canada and Norway are already active in Arctic offshore exploration.<sup>155</sup> There is overwhelming support among Alaskans for increased development of oil and natural gas resources,<sup>156</sup> and more than 40 wells have already been drilled offshore Alaska going back to the 1980s. A consistent, forward-thinking regulatory framework that prioritizes regularly scheduled lease sales is necessary to enhance U.S. energy security and maintain America's position as a global energy superpower.

Montana - **“EASTERN MONTANA’S OIL FIELDS ARE LEADING THE WAY TO BETTER AMERICAN ENERGY SECURITY, MORE MONTANA JOBS AND A STRONGER ECONOMY.”**

- Sen. Jon Tester (D)

Wyoming - **“TOO OFTEN, THE DISCUSSION IS ‘DO YOU WANT ENERGY OR THE ENVIRONMENT?’ WE HAVE TO REJECT THAT QUESTION. WE NEED, AND SHOULD EXPECT, BOTH.”** - Gov. Matt Mead (R)

Nevada - **THE AVERAGE UPSTREAM (EXTRACTION AND PRODUCTION) EMPLOYEE’S SALARY IN NEVADA IS \$74,348 – ALMOST \$31,000 MORE THAN THE AVERAGE ANNUAL SALARY ACROSS ALL INDUSTRIES AND SECTORS.**

Utah - **“UNFORTUNATELY, THE FEDERAL GOVERNMENT OFTEN HINDERS RATHER THAN HELPS ENERGY DEVELOPMENT IN OUR STATES... THE ONEROUS AND OFTEN UNNECESSARY REGULATIONS COMING FROM WASHINGTON, D.C., ARE OFTEN A DRAG ON THE ECONOMY.”**

- Gov. Gary R. Herbert (R)

Colorado - **“ONE OF THE MORE FERTILE FIELDS OF EMPLOYMENT IN COLORADO HAS BEEN OUR ENERGY INDUSTRY.”** - Gov. John W. Hickenlooper (D)

Arizona - **THE AVERAGE ANNUAL UPSTREAM INDUSTRY SALARY IN ARIZONA IS \$67,304 – ALMOST \$21,000 MORE PER YEAR THAN THE STATE AVERAGE.**

New Mexico - **“NEW MEXICO COMPANIES HAVE USED FRACKING SUCCESSFULLY FOR DECADES TO ACCESS GAS RESERVES THAT WERE PREVIOUSLY THOUGHT OUT OF REACH.”**

- Sen. Tom Udall (D)

Idaho - **“IT IS IMPORTANT THAT WE FOCUS ON THE ROADBLOCKS THAT OUR OWN GOVERNMENT IS PUTTING IN THE WAY OF PEOPLE WHO WANT TO CREATE JOBS AND WHO WANT TO DELIVER ENERGY TO THE AMERICAN PEOPLE.”** - Sen. Jim Risch (R)



# MOUNTAIN WEST

RECENT POLL OF VOTERS FOUND:

74%

OPPOSE LEGISLATION THAT COULD INCREASE THE COST OF OIL AND NATURAL GAS OPERATIONS

69%

OPPOSE HIGHER TAXES THAT COULD DECREASE ENERGY PRODUCTION

75%

BELIEVE U.S. GOVERNMENT REGULATIONS CAN CONTRIBUTE TO INCREASED COSTS FOR GASOLINE

83%

SUPPORT INCREASED PRODUCTION OF U.S. OIL & NATURAL GAS

## Mountain West | Environmental Leadership

### Environmental Stewardship and Safe Energy Production

Within the borders of America's Mountain West region are some of the planet's most unique natural wonders, from the Grand Canyon to the world's largest concentration of geysers at Yellowstone National Park to the Great Salt Lake. These eight states are home to almost one-third of America's 59 National Parks. The states of the Mountain West have a long and successful tradition of balancing the need to preserve the natural beauty of some of America's most historic and storied natural wonders while safely developing the region's abundant natural resources. The large number of national parks, in addition to military bases and other federal installations, places much of the land of the Mountain West under federal management, primarily under the authority of four agencies: the National Park Service, the Bureau of Land Management (BLM), the United States Fish and Wildlife Service and the United States Forest Service.

The Mountain West's energy producers are at the forefront of efforts to safely and responsibly deliver the energy our nation needs all while shrinking the footprint and environmental impact of energy development operations. Advancements in technology allow the oil and natural gas industry to develop U.S. energy resources more efficiently than just a few years ago. Today's energy development occurs on a much smaller "footprint" – the amount of surface area needed – generates less waste, and is less disruptive and more compatible with the environment. That's critically important as the oil and natural gas industry develops more energy in the Mountain West, which is home to some of the most ecologically sensitive and unique landscapes in the world.

Less than 10 percent of BLM's federally managed surface and mineral estate is currently leased for oil and natural gas development. And on lands administered by BLM and leased to energy companies, only a fraction of the total acreage under lease is occupied by surface operations for exploration or production – about 1 percent.<sup>157</sup>

That's not by accident. The federal government's permitting process is cumbersome and inefficient in comparison to that of the states. For example, the average time for Colorado to issue a permit is fewer than four weeks.<sup>158</sup> In contrast, because of the overly complex and burdensome permitting requirements on federal land, it took an average of 236 days just to submit all of the required paperwork required by BLM's permit application and an additional 11 weeks to issue a decision on the permit.<sup>159</sup>

The most effective energy policies are those that acknowledge the states' long record of leadership, strong history of responsible environmental stewardship and safe energy production, as well as the fact that state regulators are positioned to determine how best to develop their energy resources based on each state's unique geology and other characteristics.



**Less than 10 percent of BLM's federally managed surface and mineral estate is currently leased for oil and natural gas development. The Mountain West's energy producers are at the forefront of efforts to safely and responsibly deliver the energy our nation needs.**

# Mountain West | Environmental Leadership

Environmental Stewardship and Safe Energy Production

## Public vs. Private Land: Contrasts in Production Levels

Between 2010 and 2014, the percentage of the nation's crude oil produced on federal land decreased from 36.4 percent to 21.4 percent. According to BLM, the number of drilling permits issued on federally controlled onshore land dropped by 43 percent from 2008 to 2014.<sup>162</sup>

Federal data show crude oil production remained flat between 2009 and 2014 on federally controlled land while natural gas production declined 35 percent. By contrast, on private and state lands, where development does not need permission from the federal government, production increased 88 percent for crude and 43 percent for natural gas.

Each year the states of the Mountain West play a critical role in our nation's 21<sup>st</sup> century renaissance – producing 1 million barrels per day of crude oil and more than 4.8 tcf of natural gas in 2014. If they were a sovereign nation, they would collectively rank 20<sup>th</sup> in the world in oil production and sixth in natural gas production. Mountain West states produced more oil than Oman and more natural gas than Norway or Saudi Arabia.<sup>163</sup>

## A TALE OF TWO STATES

Seven of the top 10 states with the highest percentage of federal land – Nevada, Utah, Idaho, Arizona, Wyoming, New Mexico and Colorado – are located in the Mountain West. Two states that share sizable energy resources, a pro-business political environment and a long history of energy production but drastically different amounts of land under federal control,<sup>160</sup> Utah and Pennsylvania demonstrate how federal energy policies impact energy development within the states.

The federal government controls just 2.1 percent of Pennsylvania's land. In contrast, more than two-thirds, 66.5 percent, of Utah's land is under federal control. In 2008, the start of the shale energy revolution, Utah's total dry natural gas production was roughly 430.3 million cubic feet; Pennsylvania's, 197.3 million cubic feet. Based on EIA data from 2014 the states' roles have reversed: Utah's production increased to only 434.6 million cubic feet, barely 1 percent, while Pennsylvania's production increased more than twenty-fold to 4,174.4 million cubic feet.<sup>161</sup> The stark difference between the trajectory of energy production in Utah and Pennsylvania is not a result of geologic science but of federal energy policy.

PENNSYLVANIA

(2008-2014)

UTAH

FEDERAL LAND

2.1%

PRODUCTION  
INCREASED

2,000%

FEDERAL LAND

66.5%

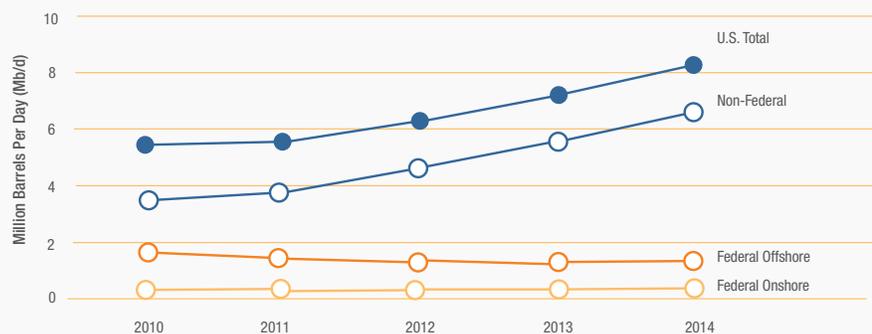
PRODUCTION  
INCREASED

1%

# Mountain West | Environmental Leadership

Environmental Stewardship and Safe Energy Production

## U.S. Crude Oil Production: Federal and Non-Federal Areas, FY2009-2013



Source: Federal data obtained from ONRR Statistics, <http://www.onrr.gov> (using sales year data). Non-federal from EIA. Figure created by CRS.

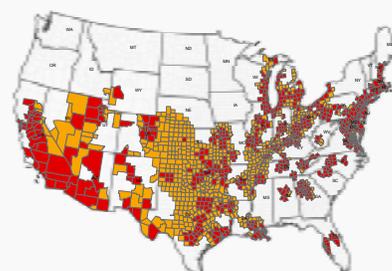
### Costly New Regulations Ignore Progress: Ozone

States of the Mountain West are sparsely populated with only a few urban centers, yet ozone regulations released by the EPA could classify large portions of their land – including pristine areas within the region’s national parks – as non-attainment areas and drastically restrict economic activity. Although ozone levels dropped 18 percent between 2000 and 2014,<sup>164</sup> the new mandate lowering the ozone standards from 75 to 70 parts per billion (ppb) could increase the number of county or county equivalents not in attainment from 217 to 958, a fourfold increase.<sup>165</sup> And perhaps the best example of why the ozone standards are unrealistic is that even pristine areas such as Yellowstone National Park and the Grand Canyon barely meet them. Non-attainment status means areas could be subject to restrictions that could delay or prevent job-creating activities from manufacturing and energy development to infrastructure projects like roads and bridges. In a letter to the EPA, a collection of 370 state coalitions

illustrated the real-world consequences of federal actions, urging the agency to avoid moving ahead with ozone standards that could “significantly damage the economy by imposing unachievable emissions limits and reduction targets on almost every part of our country, including rural and undeveloped areas.”<sup>166</sup> Made up of manufacturers, builders, contractors, road construction groups and chambers of commerce across the nation, the organizations warned, “EPA’s proposed stringent ozone standards could limit business expansion in nearly every populated region of the United States and risk the ability of U.S. companies to create new jobs.” The previous standards were the strictest in history when they were issued in 2008.<sup>167</sup> Keeping the 2008 standards, which have not been fully implemented yet, would have been the prudent and least disruptive course to protect public health without further stifling job creation and economic growth. At a minimum, EPA should work to ensure that the new standard’s implementation timeline is as long as possible to spread out the negative impact on our nation’s economy.

Ozone levels have already dropped 18 percent since 2000. EPA’s new standard of 70 ppb will dramatically increase the number of areas facing non-attainment status.

### Projected 8-Hour Ozone Non-attainment Areas



Based on a 3-year period, 2011-2013. Source: URS, July 7, 2014

## EPA’s proposed stringent ozone standards could limit business expansion in nearly every populated region of the United States.

# Mountain West | Environmental Leadership

## Environmental Stewardship and Safe Energy Production

### Leading the Way in Innovations That Protect Our Environment

America's 21<sup>st</sup> century energy renaissance has made our nation not only a global energy leader but also a leader in the reduction of greenhouse gas emissions. As a result of the greater availability of affordable, cleaner-burning domestically produced natural gas for power generation, EIA has found that carbon dioxide emissions from power plants have reached near 20-year lows.<sup>168</sup>

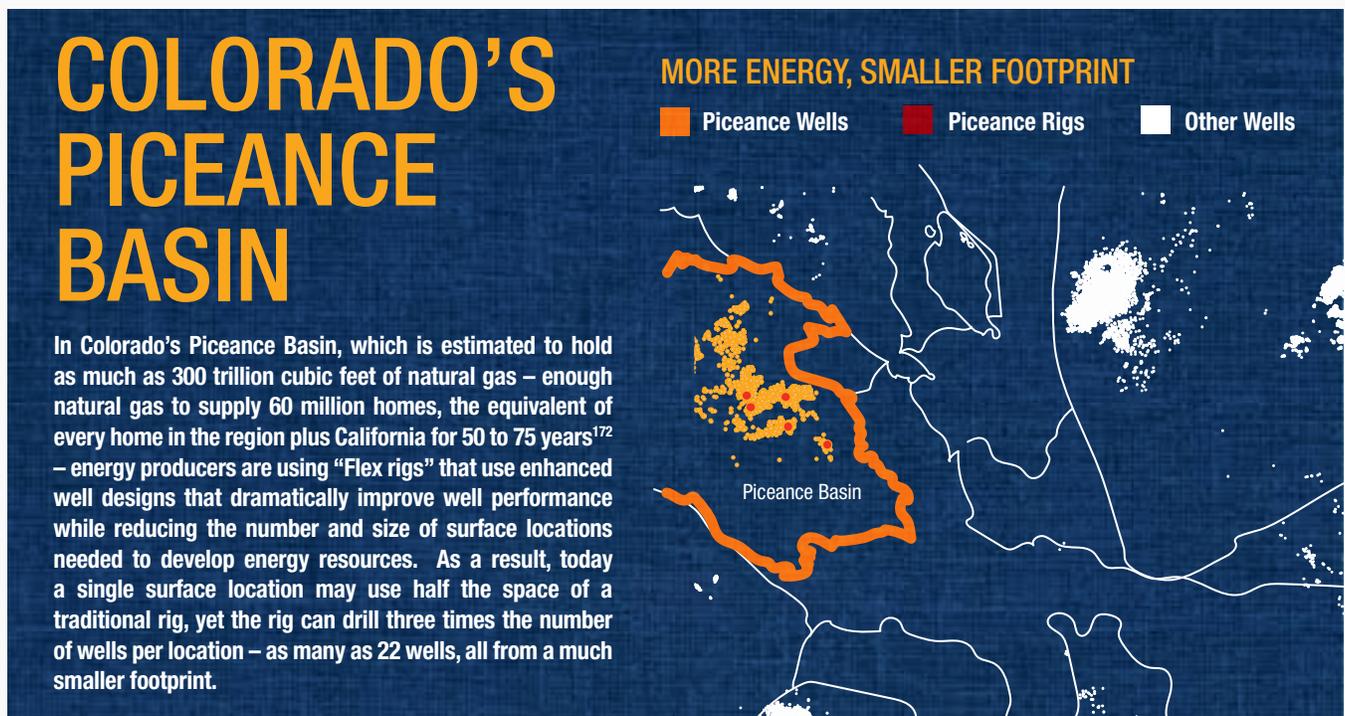
Industry's commitment to protecting our air is evident in our record of technological investments. While the federal government invested \$110.3 billion in greenhouse gas emission reduction technologies from 2000 through 2014, the oil and natural gas industry invested \$90 billion in emissions-reducing technologies, nearly as much as all other U.S.-based private industries

combined and more than twice the amount invested by each of the next two individual sectors – the automobile industry (\$38.2 billion) and the electric utility industry (\$37.1 billion).<sup>169</sup>

Even as domestic oil and natural gas production has risen dramatically, methane emissions have fallen just as dramatically, thanks to industry leadership and investment in new technologies. According to a recent EPA greenhouse gas inventory, methane emissions from hydraulically fractured natural gas wells have fallen 79 percent since 2005.<sup>170</sup> Also, total methane emissions from natural gas production are down 38 percent since 2005.<sup>171</sup> These dramatic reductions at a time of increased domestic energy production illustrate that the oil and natural gas industry's technological leadership, innovation and commitment to safety, not federal government mandates or national command-and-control style regulations, are the best way to improve environmental protection

without sacrificing the job creation and economic development potential of energy production. The states are the best places to provide the most protective regulatory oversight and also allow for responsible energy development. With their agency staffs' on-the-ground experience, state rules can be tailored to address the specific characteristics of state geology, hydrology, geography, and other characteristics. In addition, states have demonstrated the ability to quickly and effectively update and adapt their environmental and safety regulations to ensure safe, reliable and environmentally sound operations while addressing changes in technology.

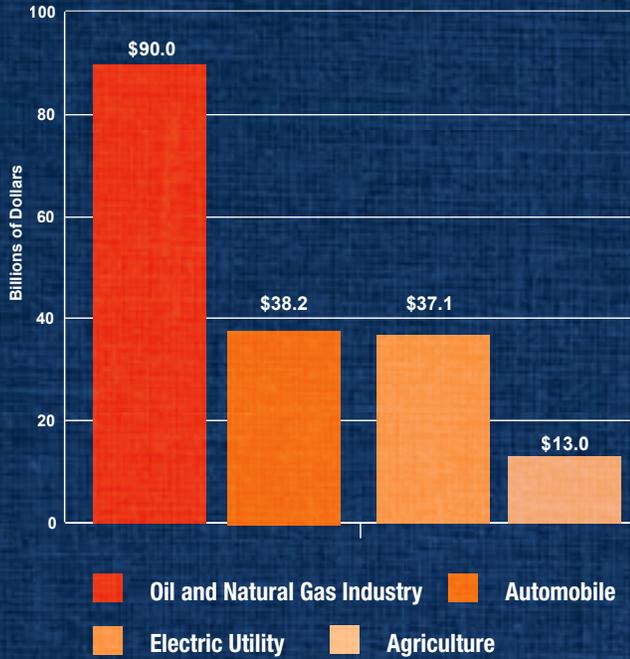
Duplicative federal regulations not based on facts or rooted in science risk stifling the American energy renaissance, our economy and position as a global energy leader, and threaten to reverse the substantial progress already made in reducing greenhouse gas emissions.



# U.S. Greenhouse Gas Emissions

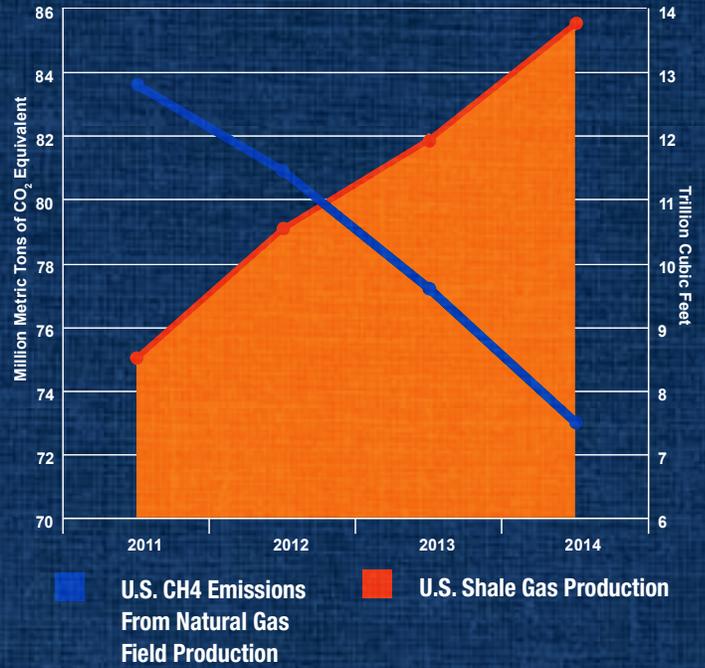
## Spending to Reduce GHG Emissions

Leading Private Investors 2000-2014



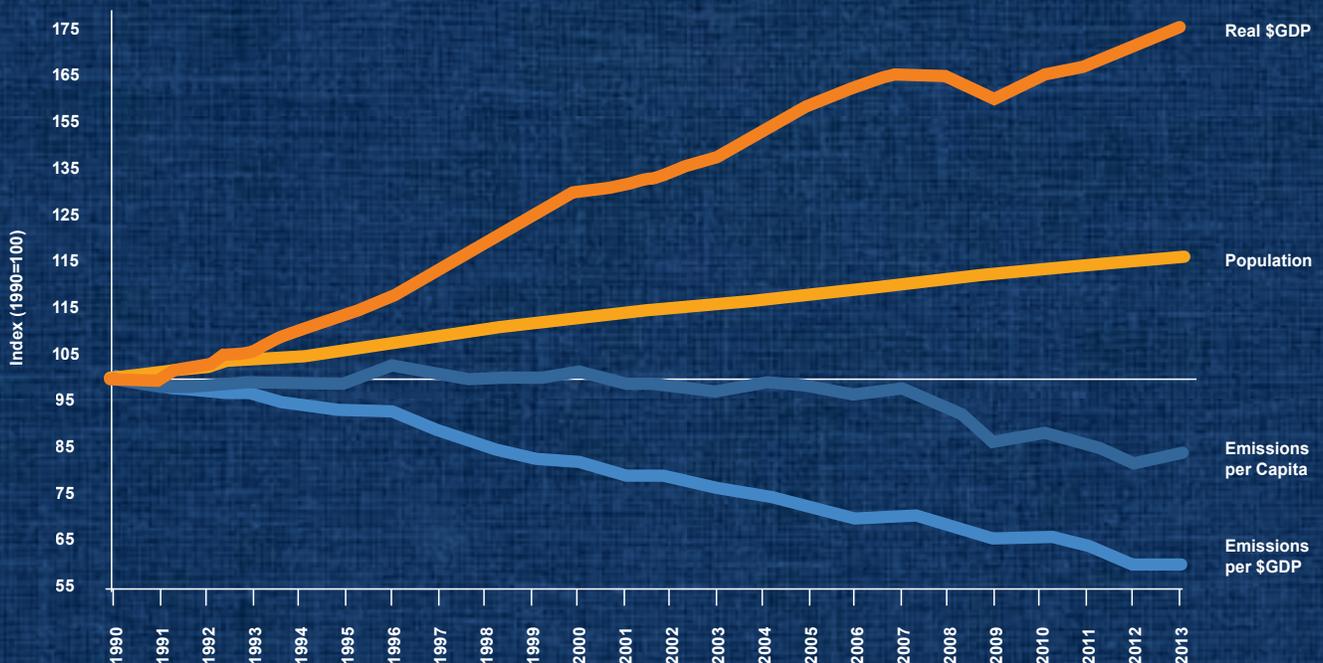
Source: T2 & Associates, September 2015

## Natural Gas Production and Methane Emissions from Production



Source: EPA

## U.S. Greenhouse Gas Emissions Per Capita and Per Dollar of Gross Domestic Product



Source: BEA, 2014

# Mountain West | Environmental Leadership

## Environmental Stewardship and Safe Energy Production

### The Right Tax Approach

Tax reform remains a priority for many in Congress and a hot topic on the presidential campaign trail. Most can agree that our nation's tax laws are too complex and are in need of reform, yet occasional calls for punitive taxes on the oil and natural gas industry are counterproductive. The industry delivers tens of millions of dollars per day to the federal government and in 2014 paid an average effective tax rate of 39.5 percent – compared to 28.7 percent for the S&P 500 Industrials.<sup>173</sup>

Like every business in America, oil and natural gas companies are allowed to deduct operating costs when calculating their federal income tax liability. Critics call deductions like these “subsidies,” but they are standard business expenses similar to the research and development deduction used by other industries. Provisions like the deduction for

intangible drilling costs (IDCs) do not affect a project's lifetime tax liability, which remains the same regardless of when it is paid. The practice simply allows oil and natural gas companies to recover their costs more quickly and reinvest in the next well. Drilling and preparation of wells represent direct investment in the U.S. economy and the generation of energy for American consumers. Increasing oil and natural gas development means more revenue for government, more jobs for Americans, and abundant and affordable energy for consumers.

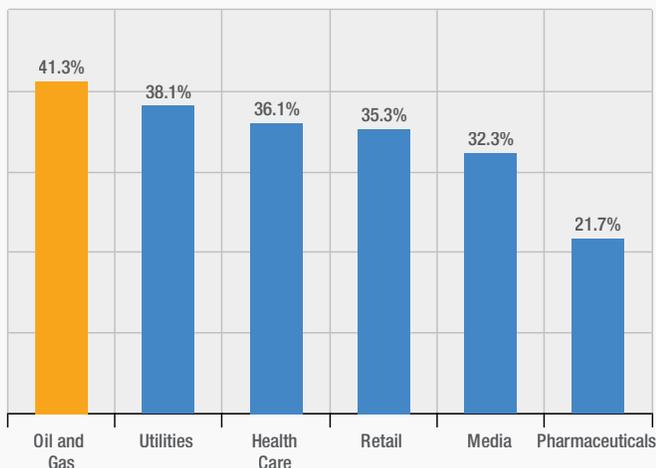
According to a 2013 Wood Mackenzie study, raising taxes on oil and natural gas production by repealing IDC could eliminate 190,000 American jobs in a single year and cut domestic production by 14 percent after 10 years.

Designating winners and losers in federal tax policy in this way risks significant negative consequences for consumers, in the form of higher energy costs, fewer jobs created and – ironically – less revenue generated for government. On the other hand, increasing oil and natural gas development means more revenue, more jobs, more domestic energy production and continued American global energy leadership.

Proposals that seek to raise taxes on the oil and natural gas industry are not a smart long-term solution to the nation's fiscal problems and would instead slow economic growth and weaken our nation's role as a global energy leader.

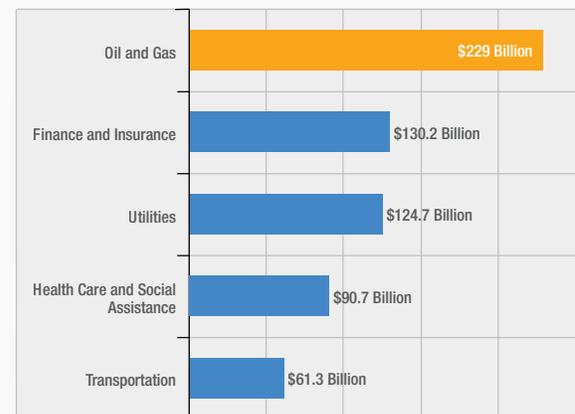
### Effective Tax Rates Among Industries

(averaged over 2010-2014)



Source: S&P Research Insight

### Average Capital Expenditure in the U.S. by Industry



Source: Census Bureau Annual Capital Expenditure Survey, 2012

## Economic Impacts of Policy Choices



## OIL AND NATURAL GAS: SUPPORTING THE ECONOMY WHILE PAYING OUR FAIR SHARE

The oil and natural gas industry supports America like no other industry. We spur economic growth through hundreds of billions of dollars in investments each year, creating jobs across a wide range of sectors and generating millions of dollars in government revenue.

- Between 2008 and 2012, America's oil and natural gas industry spent **\$174 billion each year investing in America's infrastructure**. The oil and natural gas industry accounts for almost 15 percent of all industries' U.S. capital expenditures during that period, more than the utilities and transportation industries combined.
- America's oil and natural gas industry **supports 9.8 million jobs** in the United States and 8 percent of our nation's gross domestic product.
- The oil and natural gas industry directly **created 149,000 jobs** between 2008 and 2013, while **other sectors of the economy lost around 800,000 jobs**.
- In 2011, the industry **added up to \$545 billion through capital investment, wages and dividends to the U.S. economy** – nearly \$1.5 billion every day.
- We pay our fair share – and then some. In 2014, the oil and natural gas industry paid an average effective tax rate of **39.5 percent** – compared to **28.7 percent** for the S&P 500 Industrials.
- We deliver on average **tens of millions of dollars per day to the federal treasury** in rents, royalties, bonus payments and income tax payments.
- Our industry had an **average non-gas station salary of almost \$100,088** in 2014. That's 95 percent higher than the average private-sector salary of almost \$51,296 in the U.S.

**What's even better?** With the right policies, we can do even more. If we adopt a full program of domestic oil and natural gas development – without punitive tax increases – **we could create 1 million new jobs in seven years and increase government revenue by \$127 billion by 2020**. Smart policies, not tax increases, are the way to create jobs and get much-needed revenue for the government.

North Dakota - **STATE OIL PRODUCTION HAS RISEN FROM 124,000 BARRELS PER DAY IN 2007 TO MORE THAN 1 MILLION BARRELS PER DAY TODAY.**

South Dakota - **AVERAGE SALARY FOR NON-GAS STATION OIL AND NATURAL GAS EMPLOYEES IS \$55,384, COMPARED TO \$38,600 ACROSS ALL STATE INDUSTRIES.**

Nebraska - **"KEYSTONE XL WOULD HAVE BROUGHT GOOD-PAYING JOBS AND MUCH-NEEDED TAX REVENUE TO NEBRASKA'S COUNTIES."**

- Gov. Pete Ricketts (R)

Oklahoma - **2,513 BUSINESSES IN THE OIL AND GAS SUPPLY CHAIN.**

Kansas - **148,300 STATEWIDE JOBS PROVIDED OR SUPPORTED BY THE OIL AND NATURAL GAS INDUSTRY.**

Arkansas - **92,000 STATEWIDE JOBS SUPPORTED BY THE OIL AND NATURAL GAS INDUSTRY.**

Minnesota - **122,100 STATEWIDE JOBS SUPPORTED BY THE OIL AND NATURAL GAS INDUSTRY.**

Missouri - **"FROM HEATING OUR HOMES... TO POWERING OUR FARMS AND FACTORIES... ENERGY IS AT THE CENTER OF EVERYTHING WE DO, EVERYWHERE WE GO, AND EVERY PRODUCT WE MAKE."**

- Gov. Jay Nixon (D)

Iowa - **AT 306.5 TRILLION BTU, NATURAL GAS WAS THE SECOND-LEADING SOURCE OF ENERGY FOR THE STATE IN 2013.**

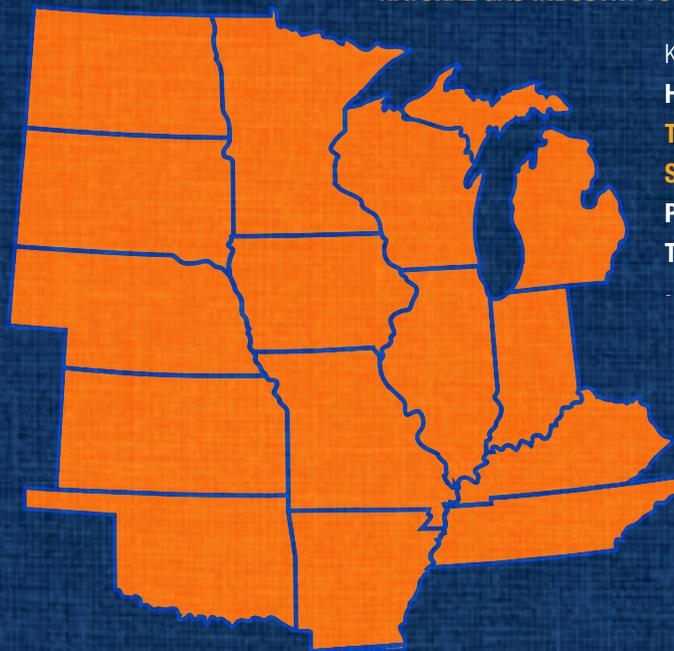
Wisconsin - **THE STATE WAS FAR AND AWAY THE LEADING PRODUCER OF FRAC SAND IN 2014, ACCOUNTING FOR NEARLY HALF OF THE NATION'S PRODUCTION.**

Illinois - **\$15.7 BILLION CONTRIBUTED BY OIL AND NATURAL GAS INDUSTRY TO STATE LABOR INCOME.**

Kentucky - **"OIL EXPORTS HAVE THE POTENTIAL TO BE A JOBS SUCCESS STORY AND A FOREIGN POLICY SUCCESS STORY, TOO."**

- Rep. Ed Whitfield (R)

Tennessee - **A MAJOR STUDY BY THE UNIVERSITY OF TENNESSEE FOUND THE RFS "CREATED MORE PROBLEMS THAN SOLUTIONS."**



Michigan - **THANKS TO NATURAL GAS, WINTER HEATING COSTS ARE PROJECTED TO DECLINE BY AS MUCH AS 18 PERCENT.**

Indiana - **"... THE PROPOSED (CLEAN POWER PLAN) RULE... REPRESENTS A GENUINE THREAT TO THE AFFORDABILITY OF ELECTRICITY."**

- Gov. Mike Pence (R)

# CENTRAL

RECENT POLL OF VOTERS FOUND:

76%

OPPOSE LEGISLATION THAT COULD INCREASE THE COST OF OIL AND NATURAL GAS OPERATIONS

82%

SUPPORT INCREASED DEVELOPMENT OF THE COUNTRY'S ENERGY INFRASTRUCTURE

74%

ARE CONCERNED ABOUT GOVERNMENT REQUIREMENTS FOR HIGHER ETHANOL BLENDS

66%

OPPOSE HIGHER TAXES THAT COULD DECREASE ENERGY PRODUCTION

# Central | Building a Secure Energy Future

## 21<sup>st</sup> Century Energy Infrastructure

Energy is transformational. Access to reliable sources of energy is fundamental to alleviating poverty and lifting the fortunes of entire nations. Look at some broad measures of human prosperity – life expectancy, infant and maternal mortality, economic growth per capita – and there’s a correlation with the availability of safe energy.<sup>174</sup> United Nations Secretary-General Ban Ki-moon has called energy the “golden thread” connecting education, economic growth, social equity and environmental sustainability.<sup>175</sup> Oil and natural gas are major strands in that thread. The two supplied 55 percent of the energy used by the world in 2013, according to the International Energy Agency. A closer look shows that the use of natural gas to generate electricity across the globe has nearly doubled since 1973 to 21.7 percent in 2013.<sup>176</sup> Access to safe, reliable energy runs modern economies and drives individual prosperity. Without a doubt, the U.S. energy revolution is a story of growing American energy self-sufficiency and opportunity. It is transforming our economy, our security outlook and the lives of individual Americans.

The game-changing impact of America’s innovation- and technology-driven energy renaissance is being seen in the U.S. heartland, where energy production in states like Texas, North Dakota and others is generating a beneficial economic wave. Yet, at the same time, the rapid growth of U.S. energy in recent years – thanks mostly to safe hydraulic fracturing and horizontal drilling – is directing attention to the infrastructure challenges facing the Central U.S., as well as the entire country, as it

transitions from an era of ever-increasing oil imports to a one of surging domestic output that engenders a new feeling of the possible.

### Production Surge

Safe and responsible fracking is unlocking vast amounts of oil and natural gas from shale and other tight-rock formations. The United States has become the world’s leading oil and gas producer, largely thanks to hydraulic fracturing.<sup>177</sup> U.S. crude oil production has climbed from about 5 million barrels per day in 2008 to approximately 8.7 million barrels per day in 2014, according to the U.S. Energy Information Administration (EIA).<sup>178</sup> That increase more than accounts for the decrease in net crude imports since 2008.<sup>179</sup>

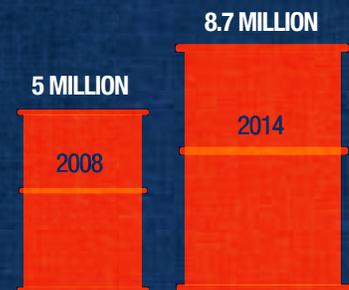
Six states in the Central U.S., plus Texas in the Gulf Coast region, are among the top 20 crude oil producers, with Texas and North Dakota ranking first and second, according to EIA.<sup>180</sup> The increase in production from just those two states since 2007 is remarkable: Texas climbed from about 1 million barrels a day to approximately 3.1 million barrels per day, and North Dakota production increased from 124,000 barrels per day to more than 1 million barrels a day. It’s all about shale and fracking: In Texas it’s the Eagle Ford, Barnett and Permian Basin plays; in North Dakota, it’s the Bakken.

Oil from Central states – Oklahoma, Kansas, Illinois, Michigan and Arkansas also rank among the top 20 producers – plays a big part in driving down U.S. net crude imports, from 10 million barrels a day in 2007 to 7 million barrels a day in 2014.<sup>181</sup> In an economy



### Largely Thanks to Hydraulic Fracturing...

#### U.S. OIL PRODUCTION (MILLION BARRELS PER DAY)



> 70%  
**GROWTH**

Source: EIA

# Central | Building a Secure Energy Future

## 21<sup>st</sup> Century Energy Infrastructure

where oil and natural gas supply 63 percent of our energy, reducing oil imports means increased energy self-sufficiency, making the United States more secure in the world.<sup>182</sup> Energy security has significant impacts on U.S. foreign policy, both in terms of stabilizing and diversifying world crude supply and in the ability for the U.S. to help friends abroad. By choosing the right energy policies, U.S. oil production can continue to increase, growing the economy and strengthening America's world posture.<sup>183</sup>

### Economic Impacts

The American energy revolution is generating economic stimulus in the Central states, as it is doing elsewhere in the country.

In Oklahoma, the oil and natural gas industry supports 364,300 jobs, or nearly 17 percent of total state employment, according to PwC.<sup>184</sup> In North Dakota, industry supports 64,000 jobs and contributes \$6.6 billion to the state economy, a share of more than 12 percent. In Illinois, where the average salary across all industries and all sectors in the state is \$54,286, the average oil and gas industry salary (excluding gas stations) is \$85,675.<sup>185</sup>

Other Central states figure significantly in the overall energy mix. For example, Wisconsin supplies more of the fine-particle sand used during hydraulic fracturing than any other state.<sup>186</sup> Illinois is home to four refineries and tens of thousands of energy-related jobs.<sup>187</sup> Major crude oil pipelines traverse Minnesota. Farther south, Kentucky is one of the leading oil producers from low-volume stripper wells. Arkansas is home to the Fayetteville shale

play, and the oil storage/pipeline hub at Cushing, Okla., is one of the world's largest.

Every state in the Central U.S. benefits from the energy industry's vast supply chain, furnishing the materials for development, the equipment and tools, support services and more – all of which are critical to sustaining and growing the energy revolution.<sup>188</sup>

### Needed: Infrastructure

The United States needs significant energy infrastructure upgrades and improvements to accommodate the dramatic growth of domestic oil and natural gas production. It starts with additional pipeline capacity. Pipelines safely deliver 99.999 percent of crude oil and petroleum products to their destinations every year.<sup>189</sup> This is due in no small part to the fact that liquid pipeline operators spent more than \$2 billion in 2013 alone evaluating, inspecting and maintaining their pipelines.<sup>190</sup>

Additional pipelines are needed to handle the surge in domestic oil and natural gas production, a lot of it occurring in the Central states. This is underscored in the dramatic increase in rail delivery of crude, rising from about 17,750 barrels of oil per day in 2008 to 921,000 barrels per day in 2014, according to the Association of American Railroads.<sup>191</sup> Industry supports a holistic approach to enhancing the safety of crude transportation by rail. This includes prioritizing the prevention of incidents, investing in measures to mitigate incidents and providing emergency responders with the resources they need should an incident occur.



**In North Dakota, industry supports 64,000 jobs** and contributes \$6.6 billion to the state economy, a share of more than 12 percent.

# Central | Building a Secure Energy Future

## 21<sup>st</sup> Century Energy Infrastructure

Infrastructure means investment. IHS estimates that needed energy sector infrastructure could spur \$1.15 trillion in private capital investment from 2014 through 2025.<sup>192</sup> The same study estimated that an average of more than \$80 billion a year will be invested through 2025 on midstream and downstream petroleum infrastructure. A more narrowly focused study by ICF International says that the U.S. and Canada will need annual average midstream infrastructure investment of about \$30 billion through 2035.<sup>193</sup>

A significant portion of that investment and construction likely would occur in the Central states, as the United States shifts the orientation of its oil-delivery network, from one that sends volumes of imported crude from the coasts to the interior to one that connects surging domestic production from Texas, North Dakota and other states with demand on the East and the West coasts and the U.S. Gulf Coast. This includes investment in crude oil pipelines and gathering lines, refined product pipelines, storage facilities and more – all necessary because there’s a new paradigm brought about by the growth in American energy.

These projects will benefit America and Americans. IHS estimates that infrastructure investment nationally could support more than 1.1 million jobs, contribute \$120 billion to U.S. gross domestic product and increase revenues to government by more than \$27 billion over a time period extending to 2025.<sup>194</sup>

Rejection of the Keystone XL pipeline underscores a significant missed infrastructure opportunity, with the U.S. State Department estimating that during the project’s construction phase about 42,000 direct, indirect and induced jobs would be created, 3,900 of which would be direct construction jobs in states along the pipeline’s route (Montana, South Dakota and Nebraska).<sup>195</sup> The State Department also indicated that property tax revenue during operations would be substantial, with an increase of 10 percent or more in 17 of the 27 counties with proposed facilities.

Such projections are based on recent history. Major energy infrastructure projects – such as the original Keystone pipeline and the Gulf Coast Pipeline (the Keystone XL project’s southern leg that didn’t require presidential approval and was completed) – generated significant local and regional benefits when they were built and provide ongoing benefits (jobs, taxes) since coming online.<sup>196</sup> This is just one of the reasons the Keystone XL pipeline had vast support from labor unions, consumers and the majority of our elected representatives.<sup>197</sup>



## These projects will benefit America and Americans.

Infrastructure investments nationally could support more than 1.1 million jobs.

# Central | Building a Secure Energy Future

## 21<sup>st</sup> Century Energy Infrastructure

### Opportunities

Increasing domestic energy development in the Central states presents a number of the same regulatory, safety and environmental considerations seen in other parts of the country. Here as elsewhere, industry is committed to safe and responsible development, worker safety, community engagement and environmental protection.

Energy development is regulated by the federal and state governments – including the federal Safe Drinking Water Act and the Clean Water Act, and state statutes that are tailored for those states' specific geologies, hydrologies and other characteristics. Additional layers of federal regulation, as proposed by EPA (on methane emissions) and enacted by the Bureau of Land Management (hydraulic fracturing rules for federal and Indian lands), are unnecessary, potentially duplicative and could hinder development. For example, BLM's fracking rules include prescriptive requirements on well cementing instead of requiring operators to meet performance standards and adhere to industry best practices.<sup>198</sup> EPA's proposed methane rule simply ignores the agency's own data showing that emissions already are falling – mostly as a result of industry innovation and the strong market incentive to collect as much methane as possible to deliver to consumers. New prescriptive methane regulations could stifle the very innovation that has resulted in dramatic emissions reductions to date.

These will only layer additional government delays and red tape to federal processes that are complicating reasonable access to oil and natural gas reserves under Washington's control. This is a big reason the federal share of U.S. crude oil production fell from 36.4 percent to 21.4 percent between 2010 and 2014, according to a Congressional Research Service report.<sup>199</sup> Processing applications for permits to drill on federal lands took an average of 227 days in fiscal year 2014 (up from 194 days in FY2013) – 20 times longer than applications for state and private lands. Greater efficiency and speed are needed to ensure the kind of certainty that's needed to foster privately funded energy development on federal lands.

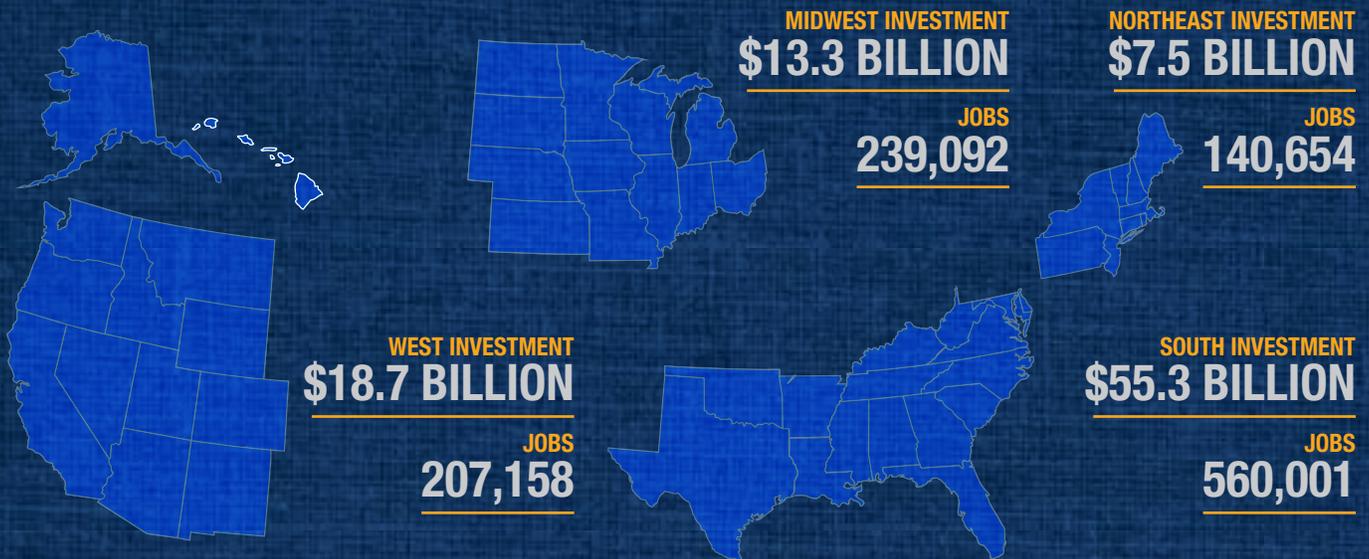
Numerous pipeline projects continue to be delayed as they await permit approvals at the federal and state levels. As assets owned by the oil and natural gas industry, these projects are "shovel ready," poised to provide jobs in their construction, revenue in their operation, and ultimately reliable and affordable energy to consumers. In addition to pipelines, locks and channels on the inland waterways suffer from age, the lack of proper maintenance, silting and narrowing. Our domestic ports also need investment to dredge and expand capacity to meet the new, larger design of tankers and cargo ships that will keep our nation competitive in a global marketplace. In the end, industry relies on the public sector to maintain the health of the locks, channels, ports and waterways to reduce delays in operation and the risk of incident.

Industry's commitment to safe operations and environmental protection is seen in a number of standards and practices developed by API-member companies in conjunction with key stakeholders. These range from well integrity to water management to properly engaging communities where development occurs.

In addition, API's Monogram Program helps ensure that manufactured equipment and other products in energy development are consistent and conform to industry standards.<sup>200</sup> Manufacturers can mark conforming products so they're easily identifiable in the field. Licensees must install and continually improve quality management systems to meet industry's specification. A safe operating environment is the focus of API's Worksafe program, which is a way for operators to ensure that their workers and contractors have been trained to industry standards.<sup>201</sup>

**The federal share of U.S. crude oil production fell from 36.4 percent to 21.4 percent between 2010 and 2014, according to a Congressional Research Service report.**

## Distribution of Potential Infrastructure Investment and Economic Contribution by U.S. Census Region, High Production Case



| NET JOBS IN...                              | NORTHEAST | SOUTH     | MIDWEST | WEST     |
|---|-----------|-----------|---------|----------|
| Jobs "Originating" in Region                | 88,342    | 668,859   | 171,657 | 218,048  |
| Net Jobs Due to Investment in Other Regions | 52,313    | (108,857) | 67,434  | (10,890) |
| Net Jobs in Region                          | 140,654   | 560,001   | 239,092 | 207,158  |

Source: IHS, "Oil & Natural Gas Transportation & Storage Infrastructure: Status, Trends, & Economic Benefits," December 2013

| POTENTIAL IMPACT ON U.S. (by 2035)      |  | PRO-ENERGY POLICIES | REGULATORY CONSTRAINTS |
|---|--|---------------------|------------------------|
| Oil & Natural Gas Production (MMboed)   |  | +8.0                | -3.4                   |
| Total Jobs Supported                    |  | +2.3 million        | -830,000               |
| GDP / Year                              |  | +\$443 billion      | -\$133 billion         |
| Total Government Revenue / Year         |  | +\$122 billion      | -\$18 billion          |
| Cumulative Government Revenue from 2016 |  | \$1.08 trillion     | -\$500 billion         |
| Total Household Income / Year           |  | +\$118 billion      | -\$43 billion          |
| Average Household Energy Expense        |  | -\$360 / year       | +\$242 / year          |
|   |  | <b>MORE</b>         | <b>LESS</b>            |

Source: A Comparison of U.S. Oil and Natural Gas Policies – Pro Development vs. Proposed Constraints – 2015 Wood Mackenzie

# Conclusion

## America's Energy Future for Generations to Come

The energy policy decisions our country makes today will determine America's energy future for generations to come. Ultimately, we want to create an American consensus on energy policy that will allow our nation to take full advantage of its bright energy future. Moreover, while the short-term cyclical nature of oil and natural gas prices continues to make news and has some questioning America's energy future, the long-term trend is clear: We will need more energy, specifically oil and natural gas, for decades to come.

It is also clear that we have entered a new era of energy abundance and have left behind decades of energy scarcity, uncertainty and dependence. It is important to note that as quickly as the positive change to our energy reality occurred, it could also be stopped or even reversed. We need elected leaders who are willing to work with industry to continue the positive trajectory of American energy development. America's newfound status as a global energy leader will continue only if we put into place and keep in place policies that foster the oil and natural gas industry's ability to innovate, invest and develop our nation's enormous energy resources and preserve our world-class refineries.

By working together to provide and refine the energy the world needs and remaining a global energy leader, we could not only usher in an unparalleled era of American energy security and stability in the global energy market, but also ensure economic opportunity and prosperity for our nation for many years to come.

To achieve that goal, we need to get our nation's energy policy right today. That means putting strategies in place that encourage America's 21st century energy renaissance and augment American global energy leadership. Getting America's energy policy right requires that it is rooted in this nation's new energy reality, grounded in market principles and based on the best science available.

The 2016 elections will produce a new Congress, a new president and new local leaders who will have a historic opportunity to build on America's place as a global energy leader. America's energy policy debate is one of the most important national discussions of our time and, as such, should be fact based because energy policy is too important to be yet another partisan litmus test.

The Vote4Energy advocacy and education campaign will help to guide a fact-based national energy policy discussion and seek to find an American consensus on our nation's energy future that will sustain this era of American energy abundance.

---

**Together, as Americans, we have an unprecedented opportunity to show the world how energy abundance can be used as a positive force rather than as a tool to harm or to control other nations as some still use their energy resources.**

We have a chance to continue to demonstrate that the private market can achieve reduction in greenhouse gas emissions during an era of increased energy production and economic expansion. This American model can be achieved, however, only if we have the political wisdom and foresight to enact energy policies that promote the safe and responsible development of our immense energy resources to create jobs, revenue and, above all, the economic opportunity that every American deserves.



# References | Vote4Energy

SOURCES: [HTTP://WWW.ENERGYTOMORROW.ORG/SOAE](http://www.energytomorrow.org/soae)

1. Wood Mackenzie for API, "A Comparison of U.S. Oil and Natural Gas Policies: Pro-development Policies vs. Proposed Regulatory Constraints," June 2015
2. Wood Mackenzie for API, "A Comparison of U.S. Oil and Natural Gas Policies: Pro-development Policies vs. Proposed Regulatory Constraints," June 2015
3. U.S. Energy Information Administration, "U.S. remained world's largest producer of petroleum and natural gas hydrocarbons in 2014," April 2015
4. President Barack Obama, "Remarks by the President on the Economy – Northwestern University," October 2014
5. America's Natural Gas Alliance, "Natural Gas and Reliability," October 2015
6. John Staub, Energy Information Administration, "The Growth of U.S. Natural Gas: An Uncertain Outlook for U.S. and World Supply," June 2015
7. IHS for API and others, "America's New Energy Future: The Unconventional Oil and Gas Revolution and the U.S. Economy – Volume 3: A Manufacturing Renaissance – Main Report," September 2013
8. IHS for API and others, "America's New Energy Future: The Unconventional Oil and Gas Revolution and the U.S. Economy – Volume 3: A Manufacturing Renaissance – Main Report," September 2013
9. IHS for API and others, "America's New Energy Future: The Unconventional Oil and Gas Revolution and the U.S. Economy – Volume 3: A Manufacturing Renaissance – Main Report," September 2013
10. U.S. Energy Information Administration Today in Energy, "Marcellus, Utica provide 85% of U.S. shale gas production growth since start of 2012," July 2015
11. U.S. Energy Information Administration, "Marcellus Region Drilling Productivity Report," October 2015
12. PwC for API, "Economic Impacts of the Oil and Natural Gas Industry on the U.S. Economy in 2011," July 2013
13. PwC for API, "Economic Impacts of the Oil and Natural Gas Industry on the U.S. Economy in 2011," July 2013
14. Energy Tomorrow, "Massachusetts, Jobs and the Shale Energy Revolution," May 2012
15. API, "Oil and Natural Gas Stimulate Massachusetts Economic and Job Growth," October 2015
16. FracFocus Chemical Disclosure Registry, October 2015
17. Environmental Protection Agency, "Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources," June 2015
18. Ground Water Protection Council, "State Oil & Gas Regulations Designed to Protect Water Resources: 2014 Edition," October 2015
19. API, "Hydraulic Fracturing – Unlocking America's Natural Gas Resources: State Regulation," October 2015
20. Congressional Research Service, "Hydraulic Fracturing and Safe Drinking Water Act Regulatory Issues," July 2015
21. U.S. Government Accountability Office, "Unconventional Oil and Gas Development: Key Environmental and Public Health Requirements," September 2012
22. Environmental Protection Agency, "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2013," April 2015
23. Environmental Science & Technology, "Methane Emissions from Natural Gas Compressor Stations in the Transmission and Storage Sector: Measurements and Comparisons with the EPA Greenhouse Gas Reporting Program Protocol," February 2015
24. Environmental Science & Technology, "Constructing a Spatially Resolved Methane Emission Inventory for the Barnett Shale Region," July 2015
25. Pennsylvania Department of Revenue, October 2015
26. Pennsylvania Public Utilities Commission, "Impact Fee Collection," October 2015
27. The New York Times, "New York's Southern Tier, Once a Home for Big Business, Is Struggling," September 2015
28. Federal Register, "Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands," March 2015
29. Environmental Protection Agency, "Oil and Natural Gas Air Pollution Standards, Regulatory Actions," November 2015
30. Progressive Policy Institute, "U.S. Investment Heroes of 2015: Why Innovation Drives Investment," September 2015
31. U.S. Energy Information Administration, "Electricity Data Browser," October 2015
32. La Capra Associates for New England Coalition for Affordable Energy, "The Economic Impacts of Failing to Build Energy Infrastructure in New England," August 2015
33. Bureau of Ocean Energy Management, "Fact Sheet: Outer Continental Shelf (OCS) Oil and Gas Leasing Program 2012–2017," October 2015
34. Bureau of Ocean Energy Management, "Assessment of Undiscovered Technically Recoverable Oil and Gas Resources of the Atlantic Outer Continental Shelf, 2014 Update," October 2015
35. Energy Tomorrow, "Offshore and All-of-the-Above Energy," January 2015
36. Quest Offshore Resources, Inc., for API and National Ocean Industries Association, "The Economic Benefits of Increasing U.S. Access to Offshore Oil and Natural Gas Resources in the Atlantic," December 2013
37. Quest Offshore Resources, Inc., for API and National Ocean Industries Association, "The Economic Benefits of Increasing U.S. Access to Offshore Oil and Natural Gas Resources in the Pacific," November 2014
38. Quest Offshore Resources, Inc., for API and National Ocean Industries Association, "The Economic Benefits of Increasing U.S. Access to Offshore Oil and Natural Gas Resources in the Eastern Gulf of Mexico," November 2014
39. API, "The Benefits of U.S. Offshore Oil and Natural Gas Development," October 2015
40. Quest Offshore Resources, Inc., for API and National Ocean Industries Association, "The Economic Benefits of Increasing U.S. Access to Offshore Oil and Natural Gas Resources in the Atlantic," December 2013
41. Quest Offshore Resources, Inc., for API and National Ocean Industries Association, "The Economic Benefits of Increasing U.S. Access to Offshore Oil and Natural Gas Resources in the Eastern Gulf of Mexico," November 2014
42. Bureau of Ocean Energy Management, "2017–2022 OCS Oil and Gas Leasing Program," October 2015
43. Energy Tomorrow, "A Bipartisan Call for Offshore Energy," August 2014
44. Outer Continental Shelf Governors Coalition Letter, "RE: Request for Comments on the 2017–2022 Draft Proposed Outer Continental Shelf Oil & Gas Leasing Program," March 2015
45. Bureau of Ocean Energy Management, "Record of Decision: Atlantic OCS Proposed Geological and Geophysical Activities Mid-Atlantic and South Atlantic Planning Areas, Final Programmatic Environmental Impact Statement (PEIS)," October 2015
46. Bureau of Ocean Energy Management, "BOEM Issues Record of Decision for Environmental Review of Geological and Geophysical Survey Activities Off the Atlantic Coast," July 2014
47. International Association of Geophysical Contractors, "What Are Seismic Surveys?" October 2015
48. William Brown, Bureau of Ocean Energy Management, "BOEM Science Notes," March 2015
49. Center for Offshore Safety, "Annual Performance Report for 2013 Reporting Year," April 2015
50. Center for Offshore Safety, "Annual Performance Report for 2014 Reporting Year," September 2015
51. API, "Following Through: How Industry and Government Are Improving the Safety of Offshore Energy Development in the Post-Macondo Era," April 2015
52. Oil Spill Commission Action, "The BP Gulf Oil Spill – Four Years Later, Statement by Senator Bob Graham and William K. Reilly, Former Co-Chairs of the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling," April 2014
53. Wood Mackenzie for API, "Outsourcing U.S. Refining? The Case for a Strong Domestic Refining Industry," June 2011
54. U.S. Energy Information Administration Annual Energy Review 2011, "Refinery Capacity and Utilization, Selected Years, 1949–2011," October 2015
55. U.S. Energy Information Administration, "Frequently Asked Questions: When was the last refinery built in the United States?" January 2015
56. U.S. Energy Information Administration, "How much gasoline does the United States consume?" March 2015
57. U.S. Energy Information Administration, "Sales of Distillate Fuel Oil by End Use," January 2015
58. U.S. Energy Information Administration, "Technical Options for Processing Additional Light Tight Oil Volumes Within the United States," April 2015
59. The Observatory of Economic Complexity, "USA Profile: Exports," October 2015
60. Employment and economic data for 2013; IMPLAN and Bureau of Economic Analysis, October 2015
61. U.S. Energy Information Administration, "Number and Capacity of Petroleum Refineries," January 2015
62. API, "Environmental Expenditures by the U.S. Oil and Natural Gas Industry, 1990–2014," November 2015
63. Environmental Protection Agency, "Overview of the Clean Air Act and Air Pollution," October 2015
64. Environmental Protection Agency, "Tier 2 Vehicle and Gasoline Sulfur Program," October 2015
65. Clean Diesel Fuel Alliance, "New Ultra Low Sulfur Diesel fuel and new engines and vehicles with advanced emissions control systems offer significant air quality improvement," October 2015

66. Auto Alliance, "Five Measures of Clean Air Progress in Autos," October 2015
67. National Journal, "One Refinery's Commitment to Safety and Service in Mississippi," October 2015
68. API, "EPA's refinery rule is much improved but remains costly," September 2015
69. U.S. Government Printing Office, "110th Congress Public Law 140," October 2015
70. Energy Tomorrow, "EPA: Late for a Very Important (RFS) Date," August 2014
71. Federal Register, "Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017," June 2015
72. NERA Economic Consulting for API, "Economic Impacts Resulting from Implementation of the RFS2 Program," July 2015
73. American Automobile Association, "Comment on the Environmental Protection Agency (EPA) Proposed Rule: Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-based Diesel Volume for 2017," July 2015
74. Coordinating Research Council, Inc., "Durability of Fuel Pumps and Fuel Level Senders in Neat and Aggressive E15," January 2013
75. U.S. Representative James Sensenbrenner, "Letter to EPA Administrator Lisa Jackson," July 2011
76. Federal Register, "Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017," June 2015
77. API analysis of Energy Information Administration data
78. U.S. Department of Energy, "fueleconomy.gov," October 2015
79. Congressional Budget Office, "The Renewable Fuel Standard: Issues for 2014 and Beyond," June 2014
80. NERA Economic Consulting for API, "Economic Impacts Resulting from Implementation of the RFS2 Program," July 2015
81. U.S. Energy Information Administration, "U.S. remained world's largest producer of petroleum and natural gas hydrocarbons in 2014," April 2015
82. U.S. Energy Information Administration, "International Energy Statistics: Gross Natural Gas Production," October 2015
83. U.S. Energy Information Administration, "Annual Energy Outlook 2015," April 2015
84. The Economist, "Conscious uncoupling: Reducing Europe's dependence on Russian gas is possible—but it will take time, money and sustained political will," April 2014
85. ICF International for API, "U.S. LNG Exports: Impacts on Energy Markets and the Economy," May 2013
86. ICF International for API, "U.S. LNG Exports: State-Level Impacts on Energy Markets and the Economy," November 2013
87. NERA Economic Consulting for U.S. Department of Energy, "Macroeconomic Impacts of LNG Exports from the United States," December 2012
88. NERA Economic Consulting for U.S. Department of Energy, "Updated Macroeconomic Impacts of LNG Exports from the United States," February 2014
89. Columbia University School of International and Public Affairs, Center on Global Energy Policy, "American Gas to the Rescue? The Impact of U.S. LNG Exports on European Security and Russian Foreign Policy," September 2014
90. U.S. Speaker John Boehner, "In Response to Russian Aggression, Key Central European Nations Plead for U.S. Natural Gas Exports," March 2014
91. Global LNG Info, "World's LNG Liquefaction Plants and Regasification Terminals," October 2015
92. Department of Energy, "Long Term Applications Received by DOE/FE to Export Domestically Produced LNG from the Lower-48 States," October 2015
93. API analysis of Bureau of Labor Statistics data, "Workplace Injuries and Illnesses Safety (WIIS) Report by the U.S. Oil and Natural Gas Industry," October 2014
94. U.S. Energy Information Administration, "California Crude Oil Estimated Production from Reserves," November 2015
95. Monterey Herald, "Oil leases off in Monterey and San Benito counties until 2016, feds say," October 2014
96. Western States Petroleum Association, "Californians Deserve To Hear More From Sacramento on Cap and Trade Expansion," August 2014
97. American Automobile Association, "Drivers to Pay Lowest Thanksgiving Gas Prices Since 2008," November 2015
98. API, "State Motor Fuel Taxes," October 2015
99. The Wall Street Journal, "California's Climate Change Revolt," September 2015
100. U.S. Energy Information Administration, "U.S. remained world's largest producer of petroleum and natural gas hydrocarbons in 2014," April 2015
101. U.S. Energy Information Administration, "Crude Oil Production," October 2015
102. U.S. Energy Information Administration, "Monthly Energy Review," October 2015
103. ICF International and EnSys Energy for API, "The Impacts of U.S. Crude Oil Exports on Domestic Crude Production, GDP, Employment, Trade, and Consumer Costs," March 2014
104. ICF International and EnSys Energy for API, "The Impacts of U.S. Crude Oil Exports on Domestic Crude Production, GDP, Employment, Trade, and Consumer Costs, Supplement: State-Level Economic and Employment Impacts," May 2014
105. U.S. Energy Information Administration, "Effect of removing crude export restrictions depends on price and resource assumptions," September 2015
106. Rice University's Baker Institute for Public Policy, Center for Energy Studies, "To Lift or Not to Lift? The U.S. Crude Oil Export Ban: Implications for Price and Energy Security," March 2015
107. Daniel Yergin, IHS, "Center for Strategic and International Studies, Video: Assessing the Economic Impact of U.S. Oil Export Policy in a Low Price Environment," March 2015
108. Michèle Flournoy, Center for a New American Security, "Congressional Statement: U.S. Senate Committee on Energy and Natural Resources United States Crude Export Policy," March 2015
109. ICF International and EnSys Energy for API, "The Impacts of U.S. Crude Oil Exports on Domestic Crude Production, GDP, Employment, Trade, and Consumer Costs, Supplement: State-Level Economic and Employment Impacts," May 2014
110. API calculation based on data from Energy Information Administration data, "States Compete Among Top Energy-Producing Nations," May 2015
111. National Journal, "No Kidding: Oregon Inches Closer to Becoming a Fossil Fuels Exporter," October 2015
112. Jordan Cove LNG, "Project FAQs," October 2015
113. Oregon LNG, "Project Overview," October 2015
114. U.S. Senator John Barrasso, Press Release, "Barrasso & Western Lawmakers Urge FERC to Support Jordan Cove LNG Project," January 2015
115. ICF International for API, "U.S. LNG Exports: Impacts on Energy Markets and the Economy," May 2013
116. EnergyTomorrow, "Listen to Vehicle Manufacturers on E15," March 2015
117. National Marine Manufacturers Association, "Response to House Energy & Commerce Committee White Paper #1 on the Renewable Fuel Standard," April 2013
118. American Motorcyclist Association, "American Motorcyclist Association opposes EPA's ethanol plan, backs up stance with nearly 30,000 signatures," July 2015
119. Historic Vehicle Association, "The Facts Stack Up Against E15," October 2015
120. Outdoor Power Equipment Institute, "Safeguarding Against the E15 Ethanol Risk," September 2013
121. California Air Resources Board, "Presentation to Clean Air Act Advisory Committee, Mobile Sources Technical Review Subcommittee," May 2015
122. U.S. Department of Agriculture, "Consumer price indexes historical data, 1974 through 2014," October 2015
123. API, "Jack Gerard's and other groups' remarks at press conference call on EPA's 2014 RFS proposal," November 2013
124. Grocery Manufacturers Association, "E15 Waiver Decision Disappointing, Unfortunate for Consumers," August 2012
125. ActionAid, "Huge Increase in U.S. Biofuels Mandates Forcing World's Poor Off their Land, says ActionAid," February 2015
126. ActionAid, "Mandating Hunger: The Impacts of Global Biofuels Mandates and Targets," February 2015
127. Environmental Working Group, "Ethanol's Broken Promise," May 2014
128. University of Michigan Energy Institute and API, "Annual Basis Carbon (ABC) Analysis of Biofuel Production at the Facility Level," August 2015
129. Energy Tomorrow, "Growing Consensus on 'Unworkable' RFS," March 2015
130. API, "Alaska: A State of Energy – A History of Energy," October 2015
131. Alaska Oil and Gas Association, "Facts and Figures," October 2015
132. U.S. Senator Lisa Murkowski, Press Office, "Landlocked: Murkowski Explains Alaskans' Access Frustrations," March 2015
133. Alaska Oil and Gas Association, "The Role of the Oil and Gas Industry in Alaska's Economy," May 2014
134. API, "Alaska: A State of Energy – Energy and Infrastructure, TAPS," October 2015
135. Bureau of Land Management, "National Petroleum Reserve in Alaska," October 2015
136. U.S. Geological Society, "2010 Updated Assessment of Undiscovered Oil and Gas Resources of the National Petroleum Reserve in Alaska (NPPRA)," October 2010

137. U.S. Senator Lisa Murkowski, Press Release, "Alaska Delegation Protests Administration Decision to Lockup 11.8 Million Acres of Petroleum Reserve," April 2012
138. Bureau of Land Management, "BLM Approves First Federal Production Well in the National Petroleum Reserve," October 2015
139. U.S. Fish and Wildlife Service, "Management of the 1002 Area within the Arctic Refuge Coastal Plain," February 2014
140. U.S. Geological Survey, "Arctic National Wildlife Refuge, 1002 Area, Petroleum Assessment, 1998, Including Economic Analysis," April 2001
141. The White House, "President Obama Calls on Congress to Protect Arctic Refuge as Wilderness," January 2015
142. API, "What America is Thinking on Energy Issues Poll: Large majorities of Alaska voters support increased production of domestic oil and natural gas," May 2014
143. Arctic Power, "Rep. Nageak (D-Barrow) responds to President Obama's ANWR Decision," January 2015
144. State Rep. Ben Nageak, Alaska Journal of Commerce, "Guest Commentary: Obama is breaking promise to Alaskans on ANWR," January 2015
145. Richard Glenn, Arctic Slope Regional Corporation, "Testimony Before the Committee on Natural Resources Subcommittee on Energy and Mineral Resources United States House of Representatives," June 2015
146. U.S. Senator Lisa Murkowski, Press Office, "Speech: Annual Address to Alaska State Legislature," February 2015
147. API, "Alaska: A State of Energy – Energy and Infrastructure, TAPS," October 2015
148. Minerals Management Service, "Undiscovered Oil and Gas Resources, Alaska Federal Offshore as of 2006," October 2015
149. Northern Economics, "Economic Analysis of Future Offshore Oil and Gas Development: Beaufort Sea, Chukchi Sea, and North Aleutian Basin," March 2009
150. API, "Alaska: A State of Energy – Federal Policies of Limitation, Onshore," October 2015
151. Shell, Press Release, "Shell updates on Alaska exploration," September 2015
152. Department of Interior, "Department of Interior Affirms 2008 Chukchi Sea Lease Sale," March 2015
153. API, "API statement regarding Obama administration decision to cancel 2016 and 2017 Arctic oil lease sales," October 2015
154. National Petroleum Council, "Arctic Potential: Realizing the Promise of U.S. Arctic Oil and Gas Resources," March 2015
155. The Wall Street Journal, "In the Race for Arctic Energy, the U.S. and Russia Are Polar Opposites," August 2015
156. API, "What America is Thinking on Energy Issues – Poll: Large majorities of Alaska voters support increased production of domestic oil and natural gas," May 2014
157. API, "Considering Oil and Gas Operations on Public Lands," August 2008
158. Colorado Oil and Gas Conservation Commission Memorandum, April 2011
159. U.S. Department of Interior, "Average Application for Permit to Drill (APD) Approval Timeframes: FY2005–FY2012," January 2015
160. Congressional Research Service, "U.S. Crude Oil and Natural Gas Production in Federal and Non-Federal Areas," April 2015
161. U.S. Energy Information Administration, "State Profiles and Energy Estimates," October 2015
162. Energy Tomorrow, "White House Politics Versus the American People," October 2015
163. API calculations based on Energy Information Administration data, October 2015
164. Environmental Protection Agency, "Ozone: National Trends in Ozone Levels," September 2015
165. API, "EPA data show absurdity of changing ozone standards," September 2015
166. Business groups letter to White House Chief of Staff Denis McDonough, August 2015
167. Energy Tomorrow, "Policy at a Glance: OZONE NAAQS," October 2015
168. U.S. Energy Information Administration, "Monthly power sector carbon dioxide emissions reach 27-year low in April," August 2015
169. T2 and Associates for API, "Key Investments in Greenhouse Gas Mitigation Technologies from 2000 Through 2014 by Oil and Gas Firms, Other Industry and the Federal Government," September 2015
170. Environmental Protection Agency, "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013," April 2015; U.S. Energy Information Administration, "Marketed Natural Gas Production," October 2015
171. Environmental Protection Agency, "Overview of Update to Methodology for Hydraulically Fractured Gas Well Completions and Workovers in the Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2012 (2014 Inventory)," April 2014
172. API, "Strategic Energy Resources: Piceance Basin, Colorado," October 2015
173. API, "Oil & Natural Gas: Supporting the Economy While Paying our Fair Share," February 2015
174. Energy Tomorrow, "Energy – For Life," July 2015
175. United Nations Foundation, "What We Do: Achieving Universal Energy Access" October 2015
176. International Energy Agency, "2015 Key World Energy Statistics," November 2015
177. U.S. Energy Information Administration, "U.S. remained world's largest producer of petroleum and natural gas hydrocarbons in 2014," April 2015
178. U.S. Energy Information Administration, "Petroleum & Other Liquids: U.S. Field Production of Crude Oil," October 2015
179. Energy Tomorrow, "Fueling the Energy Revolution," September 2015
180. U.S. Energy Information Administration, "Rankings: Crude Oil Production," July 2015
181. U.S. Energy Information Administration, "Petroleum & Other Liquids: U.S. Imports of Crude Oil," October 2015
182. U.S. Energy Information Administration, "Annual Energy Outlook 2015," April 2015
183. Wood Mackenzie for API, "A Comparison of U.S. Oil and Natural Gas Policies: Pro-development Policies vs. Proposed Regulatory Constraints," June 2015
184. PwC for API, "Economic Impacts of the Oil and Natural Gas Industry on the U.S. Economy in 2011," July 2013
185. U.S. Department of Labor, "Bureau of Labor Statistics: Quarterly Census of Employment and Wages," October 2015
186. National Journal, "Wisconsin's Sandbox: Northern White Brings Arrival of Mines, Money and Tourism," October 2015
187. National Journal, "Energy Means 'Great Jobs' for Union Workers," October 2015
188. API, "Oil and Natural Gas Stimulate American Economic and Job Growth: Vendor Survey Findings Report," September 2014
189. API, "Pipeline Safety Excellence," October 2015
190. Association of Oil Pipe Lines, "Pipelines Are Safe and Getting Safer," October 2015
191. Association of American Railroads, "Crude Oil By Rail," October 2015
192. IHS for API, "Oil & Natural Gas Transportation & Storage Infrastructure: Status, Trends, & Economic Benefits," December 2013
193. ICF for INGAA Foundation, "North American Midstream Infrastructure through 2035: Capitalizing on Our Energy Abundance," March 2014
194. IHS for API, "Oil & Natural Gas Transportation & Storage Infrastructure: Status, Trends, & Economic Benefits," December 2013
195. U.S. Department of State, "Record of Decision and National Interest Determination," November 2015
196. TransCanada, "Local benefits of Gulf Coast Project illustrate importance of Keystone XL," January 2015
197. Energy Tomorrow, "The People Say Build Keystone XL," February 2015
198. API comments to U.S. Department of the Interior, Bureau of Land Management, "Oil and Gas: Hydraulic Fracturing on Federal and Indian Lands," August 2013
199. Congressional Research Service, "U.S. Crude Oil and Natural Gas Production in Federal and Non-Federal Areas," April 2015
200. API, "Meaning of API Monogram," October 2015
201. API, "API WorkSafe," October 2015



