

Factsheet

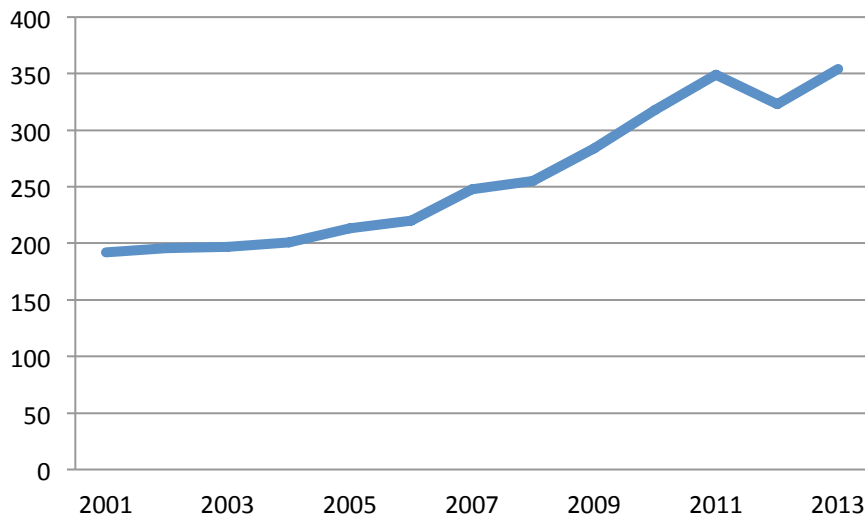
Domestic Energy

How good roads sustain America's domestic energy boom

Growth in Domestic Energy Fuels Jobs and the Economy

- **U.S. Energy Sector is Vital to GDP** - The U.S. energy industry, which includes extraction, refining, distribution, and transportation elements, is a vital component of the U.S. economy, accounting for nearly 5% of GDP in 2013 (BEA, 2014¹). Domestic energy helped return the U.S. to prosperity after the Great Recession; in 2012, for example, domestic energy was responsible for about 8% of total GDP growth, according to the White House Council of Economic Advisors².
- **Domestic Energy Reserves are Up** - The U.S. produces considerably more of its own energy today than in previous decades, which is transforming international energy markets and the domestic economy. Use of 'unconventional' technologies like horizontal drilling and hydraulic fracturing is providing access to oil and gas reserves that cannot be extracted by drilling traditional wells. As a result, from 2001 to 2013, natural gas reserves in the U.S. grew by over 80 percent from 192 to 354 trillion cubic feet³.

Change in U.S. Proved Reserves of Natural Gas 2001-2013 (Trillion Cubic Feet)



¹ Bureau of Economic Analysis; *National Product Accounts*

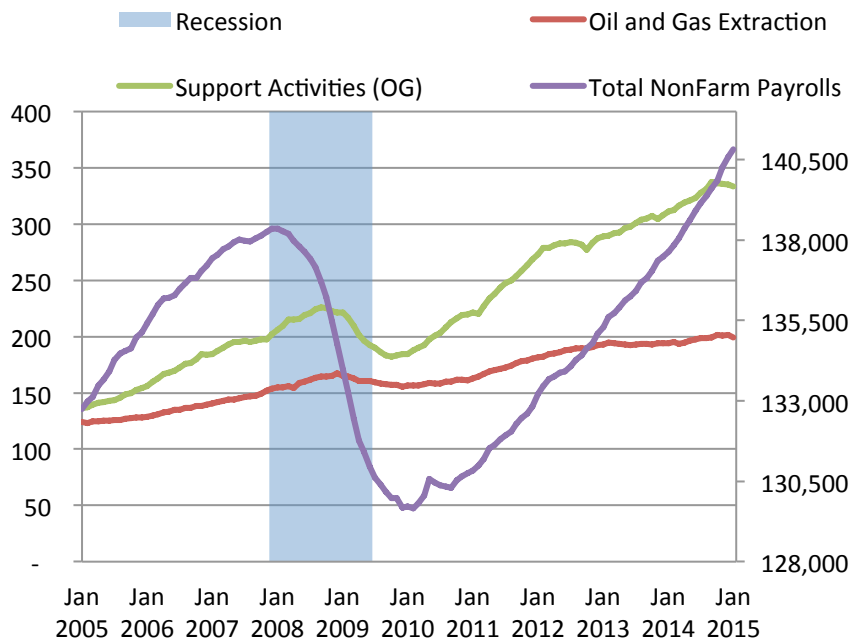
² White House Council of Economic Advisors; *The All-of-the-Above Energy Strategy as a Path to Sustainable Economic Growth*; May 2014

³ U.S. Energy Information Administration; *U.S. Crude Oil and Natural Gas Proved Reserves, 2013* (Dec 2014)

Source: U.S. Energy Information Administration, 2014

- **Domestic Energy Creates Jobs** - The surge in domestic energy production is adding employment in oil and gas extraction and jobs in supporting industries. As the graph below shows, oil and gas-related employment were not as greatly impacted by the steep 2008-09 recessionary decline that sharply reduced overall non-farm payrolls.

Total U.S. Nonfarm Payrolls and Oil and Gas Payrolls (Thousands)



Source: Bureau of Labor Statistics, 2015

- **2015 Energy Price Impacts** - A global downturn in energy prices in 2015 has slowed growth in the domestic energy sector somewhat, but overall, the industry remains an important part of the broader economy. While the short-term oil price trend is downward, the U.S. Energy Information Administration forecasts long term growth in U.S. crude oil prices and production, and less crude oil imports.⁴
- **State-level GDP Benefits** - For energy-rich states, the oil and gas boom has been a powerful economic engine. In Alaska, Oklahoma, Texas, and Wyoming, for example, oil and gas extraction now accounts for more than 10 percent of State GDP (BEA, 2012⁵). In North Dakota and Louisiana, oil and gas extraction as a share

⁴ U.S. Energy Information Administration, *Annual Energy Outlook 2015 (AEO2015)*, April 2015.

⁵ Bureau of Economic Analysis; *Regional Data By Industry 2012*

of State GDP has increased drastically over the past years, from 1% and 6%, respectively in 2005, to over 4% and 8% in 2012.

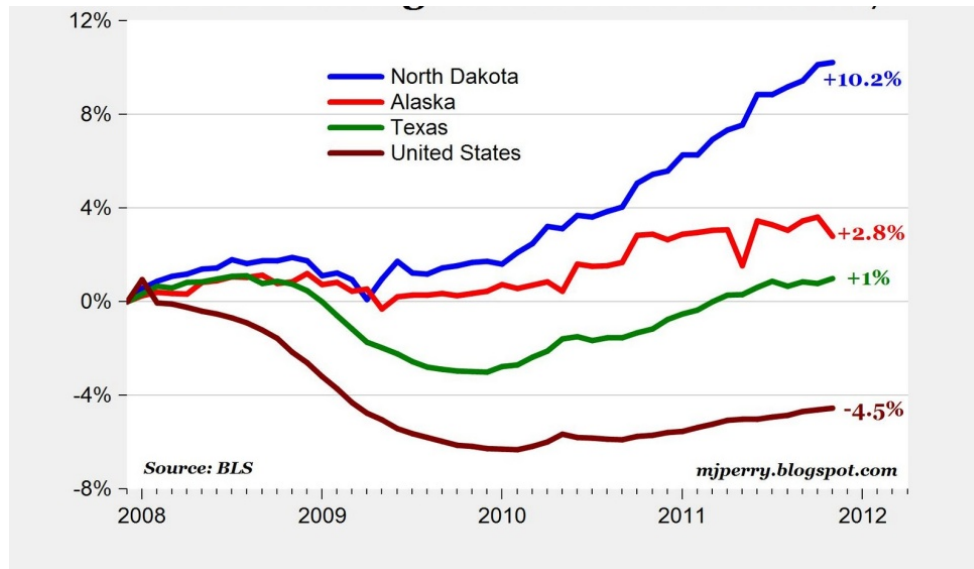
Oil and Gas-related Gross Domestic Product (GDP) by State (Selected States)
(Millions of 2009 Dollars)

Oil and Gas Extraction Industry GDP				
Geography	2005	2012	% Change	GDP/GSP % Change (2005-2012)
United States	121,315	202,043	67%	7%
Alaska	7,047	10,773	53%	28%
California	8,134	19,504	140%	6%
Colorado	5,279	6,764	28%	10%
Kansas	823	994	21%	12%
Louisiana	9,955	15,804	59%	2%
North Dakota	167	1,545	825%	67%
Oklahoma	9,873	12,247	24%	18%
Pennsylvania	445	2,606	486%	7%
Texas	66,193	116,973	77%	27%
West Virginia	470	603	28%	7%
Wyoming	3,946	4,348	10%	23%

Source: BEA Regional Data 2005-2012

- State-level Jobs Benefits** - Energy production has added employment in many states; examples include Alaska, North Dakota, and Texas, which all outpaced national employment growth from 2008-2012. Growth has been strongest in states like North Dakota that benefit most from new well drilling technologies.

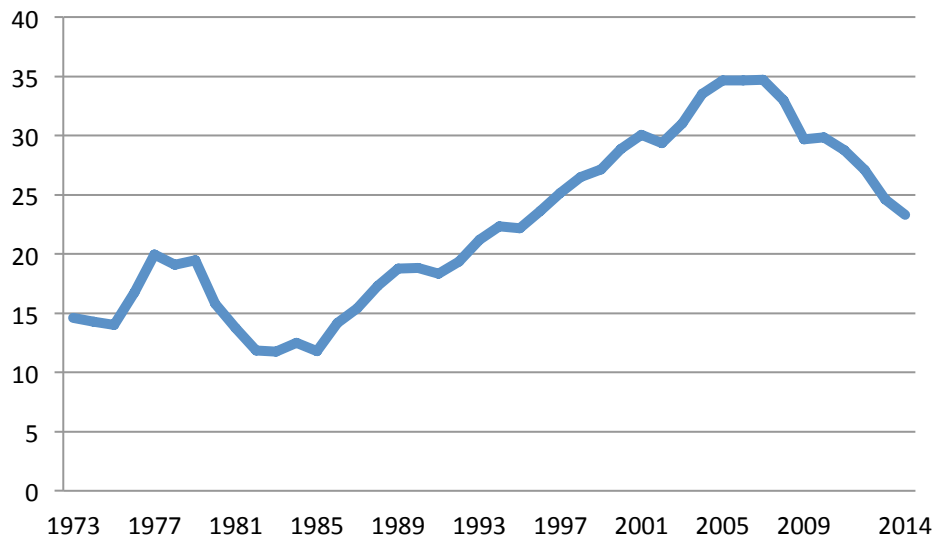
Percent Change in Total Nonfarm Payroll Employment (Selected States)



Source: Bureau of Labor Statistics, 2014

- **Energy Imports Declining** - Domestic oil and gas production, combined with more use of renewable energy and energy efficiency gains, mean that the U.S. today is much less reliant on foreign energy sources (as shown in the graph below) which reduces the vulnerability of the national economy to external adverse supply shocks.

Total Primary Energy Imports 1973-2014 (Quadrillion BTU)



Source: U.S. Energy Information Administration, 2014

Domestic Energy-related Transportation Challenges

A network of 'complementary capital' is necessary to sustain growth in the energy industry. Within this network, transportation infrastructure – including rail, roads and pipelines - connects buyers and sellers. During exploration, energy producers depend on transportation infrastructure to move large quantities of supplies and equipment to their drilling sites. Once in production, oil and gas wells require reliable and safe transportation to deliver raw goods to refineries. Similarly, these refineries must supply retailers, who distribute to final customers. At every step, transportation serves a pivotal role in connecting buyers, sellers, and goods.

Transportation Infrastructure Capacity - Long-term growth in energy production will almost certainly have a significant impact on U.S. transport systems in place and needed in the future to move energy products. Modes particularly affected include rural roads, rail, pipelines, and ports:

- **Roads** – Many of the roads connecting oil and gas fields in states like North Dakota, Texas, West Virginia were built in the 1950s or earlier, long before modern trucks, which are heavy and long. Texas Department of Transportation (TxDOT) says as many as 1,100 truck trips are needed to begin production on a well and Maryland Department of Environment estimates the number to be 1,800 truck trips. Growth in truck traffic can create safety concerns and infrastructure damage.
- **Railroads and Pipeline Capacity and Coverage** – While energy continues to be transported primarily by pipeline, U.S. pipeline capacity is aging and does not serve new production locations well, particularly in the upper Midwest, where shale oil production has increased dramatically. In the short run, while pipeline capacity catches up, producers have increasingly turned to rail. According to the rail industry's Association of American Railroads, U.S. railroads delivered 435,560 carloads of crude oil in 2013 compared to 9,500 carloads in 2008. While growth was the trend for at least five years, the short term "bubble burst" in prices and production, currently being experienced, is having a significant and opposite economic and financial impact on railroads, and on railroad capacity. Reductions in energy production have resulted in excess railroad capacity, which negatively affects railroad bottom lines.
- **Ports** – If the oil export ban is lifted, and as crude oil imports fall, ports may see possibly significant demand for new export oil terminal capacity, to move increased export product from shore to ship. The problems on the U.S. east coast may be greater. U.S. ports on the east coast *import* substantial amounts of crude oil now, and as crude imports decline as projected, the east coast ports and inland infrastructure may need to adjust, either by converting facilities to other uses, or by shifting from import to export capacity.

Safety & Environmental Issues - The importance to the energy industry of transportation is not just only capacity. A well functioning network of transportation assets may help to mitigate potentially devastating disasters involving energy commodities and hazardous materials. Areas of concern focus on railroad transport of crude oil, and pipeline safety:

- **Railroad safety** – Transport of crude, particularly the crude oil products being produced in Canada and the Bakken fields, by rail is increasingly raising alarms. Concerns include environmental impacts, but most dramatically focus on

safety. In fact, as reported by the Congressional Research Service,⁶ the most recent data available indicate that railroads consistently *spill less* crude oil per ton-mile transported than other modes of land transportation. Nonetheless, safety and environmental concerns have been underscored by a series of major accidents across North America involving crude oil transportation by rail—including a catastrophic explosion and fire that caused many fatalities and destroyed much of Lac Mégantic, Quebec, in 2013. Following that incident, the U.S. Department of Transportation issued a safety alert warning that the type of crude oil being transported from the Bakken region may be more flammable than traditional heavy crude oil. Oil train spills and fires continue to occur regularly, and have received extensive coverage in some media outlets.

- **Pipeline Safety** - According to the FracTracker Alliance, an industry advocacy organization, the vast majority of pipeline incidents are due to deficient infrastructure by way of corrosion failure and equipment failure (FracTracker, 2014⁷). While pipeline failures are not as dramatic as oil train explosions, impacts on the environment can be catastrophic as well.

⁶ Congressional Research Service, Ibid.

⁷ FracTracker Alliance <http://www.fracktracker.org/2014/04/pipeline-incidents/>