

# Benefits of Natural Gas Production and Exports for U.S. Small Businesses: Nationally and Key States

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**November 2014**



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# Executive Summary

**The U.S. has undergone nothing less than an energy revolution over the past decade – shifting from a nation of energy dependence to a nation of energy abundance. The U.S. became the top natural gas producer in 2010, the largest combined oil and natural gas producer in 2013, and the largest oil producer in 2014.**

Looking at natural gas, this revolution has come about due to private-sector investment, innovation and efficiencies, specifically in the forms of horizontal drilling and hydraulic fracturing allowing for access to shale gas that previously was uneconomical to produce. Indeed, the U.S. natural gas market has changed dramatically over the past near-decade. For example, the annual average price of natural gas in the U.S. declined by 57 percent from 2005 to 2013. While assorted market factors come into play, lower prices have resulted directly from expanded U.S. natural gas production – a 35 percent increase from 2005 to 2013.

That increased production has been good news for the energy sector, including for employment and business growth (especially small and midsize businesses), especially in those states where natural gas production has expanded, with indirect benefits spreading across the nation. The excellent performance of the oil and natural gas sectors of our economy stands in sharp contrast to the gross under-performance of the overall economy since 2007.

Looking ahead, the opportunity exists for exporting liquefied natural gas (LNG), given the large differential in natural gas prices in the U.S. versus elsewhere in the world, increasing U.S. production, and rising global demand.

**Positive Impact on Job Growth.** The difference in the employment story between the energy sector and the overall economy could not be starker. While overall employment fell between 2005 and 2012, jobs grew markedly in the energy sector given the striking expansion in domestic natural gas and oil production. While U.S. total employment *declined* by 0.3 percent from 2005 to 2012, jobs *grew*:

- by 46.1 percent in the oil and gas extraction sector;
- by 61.0 percent in the drilling oil and gas wells sector;
- by 100.2 percent in the support sector for oil and gas operations;
- by 66.1 percent in the oil and gas pipeline and related structures construction sector;
- and by 67.1 percent in the oil and gas field machinery and equipment manufacturing sector.

**While overall employment fell between 2005 and 2012, jobs grew markedly in the energy sector given the striking expansion in domestic natural gas and oil production.**

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While U.S. employers overall shed more than 378,000 jobs over this period, employers in the five energy industries included here directly added more than 293,000 jobs (that is, direct jobs in each sector without factoring in broader indirect jobs tied to expanded production and reduced prices).

**Impact on Small Business and Entrepreneurship.** For all of the U.S., total employer firms declined by 5.0 percent from 2005 to 2011, including a 4.7 percent decline in firms with less than 20 workers, and a 5.0 percent fall in firms with less than 500 workers. Consider the growth in energy industries over the same period. The number of employer firms:

- among oil and gas extraction businesses, grew by 4.9 percent, including 4.1 percent among firms with less than 20 workers and 4.8 percent among firms with less than 500 workers.
- among drilling oil and gas wells businesses, grew by 11.3 percent, including 7.9 percent among firms with less than 20 workers and 11.3 percent among firms with less than 500 workers.
- among support for oil and gas operations businesses, grew by 31.3 percent, including 29.1 percent among firms with less than 20 workers and 31.3 percent among firms with less than 500 workers.
- among oil and gas pipeline and related structures construction businesses, grew by 14.3 percent, including 12.2 percent among firms with less than 20 workers, and 12.5 percent among firms with less than 500 workers.
- among oil and gas field machinery and equipment manufacturing businesses, grew by 15.0 percent, including 8.5 percent among firms with less than 20 workers and 14.7 percent among firms with less than 500 workers.

While the number of U.S. employer firms overall declined by 299,122 over this period, employer firms in these five energy industries included here increased by 2,758.

**Small Business Dominates the Energy Sector.** Each energy sector reviewed in this report is overwhelmingly populated by small and midsize businesses:

- Among oil and gas extraction businesses, 91.1 percent of employer firms in 2011 had less than 20 workers, and 98.5 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 79.8 percent of employer firms in 2011 had less than 20 workers, and 97.6 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 83.3 percent of employer firms in 2011 had less than 20 workers, and 98.7 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 65.5 percent of employer firms in 2011 had less than 20 workers, and 95.3 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 57.6 percent of employer firms in 2011 had less than 20 workers, and 91.8 percent had fewer than 500 employees.

**In the States.** This report features profiles in terms of natural gas production, employment in key energy sectors, and business establishment growth and size data in each of those sectors for the top 19 states in terms of natural gas marketed production in 2012. States are listed as growth states, declining states or mixed states in terms of the recent trend in natural gas production.

The benefits of being a growth state are clear. Among the 12 growth states, all experienced growth in jobs, and in the number of small and midsize businesses within the key energy sectors examined, with growth being particularly robust in ten of those states. The 12 growth states are: Arkansas, Colorado, Louisiana, North Dakota, Ohio, Oklahoma, Pennsylvania, Texas, Utah, Virginia, West Virginia, and Wyoming.

**LNG Export Opportunities.** The trends in terms of expanded investment, entrepreneurship, economic growth and employment given the expansion of domestic energy production can be expanded further through LNG exports to meet growing global energy demands.

While arguments have come from some circles that LNG exports would hurt domestic businesses that use natural gas as an industrial input, Economics 101 reminds us that the economy is not a zero-sum game. Therefore, expanded demand for U.S. natural gas in international markets will result in greater U.S. natural gas production, increased investment, enhanced GDP growth, rising incomes, and more jobs – just as is the case with increasing exports in other U.S. industries, including those that utilize natural gas.

Increased U.S. natural gas production to meet growing global needs obviously points to further strong growth for small and midsize businesses, and for employment. At the same time, the minimal price impact that expanded exports might have on domestic prices would have small effects on domestic consumers of natural gas – especially given the enormous declines we’ve already experienced in natural gas prices. And even those small, potential price increases must be further offset against the effect of the overall positive for economic growth coming via generally lower natural gas prices and expanded natural gas production. Study after study has confirmed these basic tenets of economics and how markets work.

After reviewing the available research, Margo Thorning, chief economist for the American Council for Capital Formation, concluded that “the preponderance of the economic analyses of the impact exports of LNG from the U.S. show positive overall benefits in terms of jobs, investment and GDP growth. In addition, the impact on U.S. domestic natural gas prices rises will be relatively small, thus allowing U.S. customers to maintain a strong competitive advantage over our trading partners.”

In the end, LNG exports would further enhance incentives for domestic natural gas production, with commensurate benefits being accrued in terms of economic, employment, business, and income growth. The lone real obstacle to this tremendous opportunity is government policy going awry, whether that be misguided limits on or obstacles to U.S. exports, or wrongheaded and costly tax and/or regulatory burdens or schemes imposed on carbon-based energy production at the national level or in the states.

# Introduction

**The U.S. has undergone nothing less than an energy revolution over the past near-decade – shifting from a nation of energy dependence to a nation of energy abundance. The U.S. became the top natural gas producer in 2010, the largest combined oil and natural gas producer in 2013, and the largest oil producer in 2014.**<sup>1</sup>

The U.S. energy revolution has had nothing to do with renewable energy sources that get so much attention, along with notable subsidies, in the world of politics. Instead, the revolution has been all about private-sector investment, innovation and efficiencies.

Regarding natural gas, the U.S. Energy Information Administration (EIA) has explained: “Over the past decade, the combination of horizontal drilling and hydraulic fracturing has allowed access to large volumes of shale gas that were previously uneconomical to produce. The production of natural gas from shale formations has rejuvenated the natural gas industry in the United States.”<sup>2</sup> The EIA also has pointed out: “The productivity of oil and natural gas wells is steadily increasing in many basins across the United States because of the increasing precision and efficiency of horizontal drilling and hydraulic fracturing in oil and natural gas extraction.”<sup>3</sup>

Indeed, the U.S. natural gas market has changed dramatically over the past near-decade. Consider the drop in natural gas prices. The annual average price of natural gas (Henry Hub natural gas spot price (dollars per million BTUs)) went from \$8.69 in 2005 to \$3.73 in 2013. That 57 percent decline generated considerable savings for U.S. households and businesses via electricity prices – given that 27 percent of electric power is generated via natural gas – as well as for a wide array of industries that use natural gas in their production processes.

While assorted market factors come into play, lower natural gas prices have resulted directly from expanded U.S. natural gas production. That increased production has been good news for the energy sector, including for employment and business growth, especially in those states where natural gas production has expanded, with indirect benefits spreading across the nation.

**The U.S. becoming a leader in meeting global natural gas demand would be a clear benefit to the overall U.S. economy, and particularly in states leading the way in natural gas production.**

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Looking ahead, the opportunity exists for exporting liquefied natural gas (LNG)<sup>4</sup>, given the large differential in natural gas prices in the U.S. versus elsewhere in the world, increasing U.S. production, and rising global demand.

For example, as noted in the International Energy Agency's *World Energy Outlook 2013*, “Although gas price differentials have come down from the extraordinary levels seen in mid-2012, natural gas in the United States still trades at one-third of the import prices to Europe and one-fifth of those to Japan.”<sup>5</sup> And the EIA reported in its 2014 *Annual Energy Outlook*: “In the AEO2014 Reference case, natural gas production grows by an average rate of 1.6%/year from 2012 to 2040, more than double the 0.8% annual growth rate of total U.S. consumption over the period. The growth in production meets increasing demand and exports (liquefied natural gas [LNG] and pipeline exports), while also making up for a drop in natural gas imports. The United States becomes a net exporter of natural gas before 2020.”<sup>6</sup>

The U.S. becoming a leader in meeting global natural gas demand would be a clear benefit to the overall U.S. economy, and particularly in states leading the way in natural gas production.

It's important to consider the benefits that accrue to workers, small businesses, individual states, and the overall U.S. economy when domestic energy production, such as in natural gas, expands. Let's review key points.

# United States and Natural Gas

**After small increases throughout the 1990s, for example, natural gas marketed production in the U.S. hit a 26-year high of 20.57 trillion cubic feet in 2001, and then declined for the following four years. In 2005, U.S. natural gas marketed production registered 18.05 trillion cubic feet, which was roughly the same level as in 1993. However, growth resumed, and natural gas production in the U.S. hit an all-time high in 2011, and continued to grow, reaching 25.62 trillion cubic feet in 2013. That was a 35 percent increase over 2005.**

All of the increase in natural gas production has come from shale gas in recent years. From 2007 to 2012, for example, while gross withdrawals of natural gas from gas, oil and coalbed wells declined, gross withdrawals from shale gas wells increased by 417 percent.

Looking into the future, the EIA offered the following points to consider in its 2014 *Annual Energy Outlook*:

- “The 56% increase in total natural gas production from 2012 to 2040 in the AEO2014 Reference Case results from increased development of shale gas, tight gas, and offshore natural gas resources [Figure 1]. Shale gas production is the largest contributor, growing by more than 10 Tcf, from 9.7 Tcf in 2012 to 19.8 Tcf in 2040. The shale gas share of total U.S. natural gas production increases from 40% in 2012 to 53% in 2040. Tight gas production and offshore gas production increase by 73% and 78%, respectively, from 2012 to 2040, but their shares of total production remain relatively constant.”<sup>7</sup>
- “In the AEO2014 Reference case, growing natural gas production from shale gas and tight oil formations supports an increase in U.S. exports of LNG and pipeline gas. Net exports of LNG increase by 3.5 Tcf from 2012 to 2040, representing 48% of the total increase in U.S. natural gas net exports over the period. The United States becomes a net LNG exporter in 2016, with gross exports reaching their peak level of 3.5 Tcf in 2030.”<sup>8</sup>
- However, it also must be pointed out that the EIA’s Reference case is only one possible outcome. For example, as explained in the *Annual Energy Outlook*:

“Prospects for production from tight oil and shale gas resources are uncertain, both because large portions of the formations have little or no production history, and because future technology could increase well productivity while reducing costs... The High Oil and Gas Resource case assumes (1) higher estimates of onshore lower 48 tight oil, tight gas, and shale gas resources than in the Reference case, as a result of higher estimated ultimate recovery (EUR)

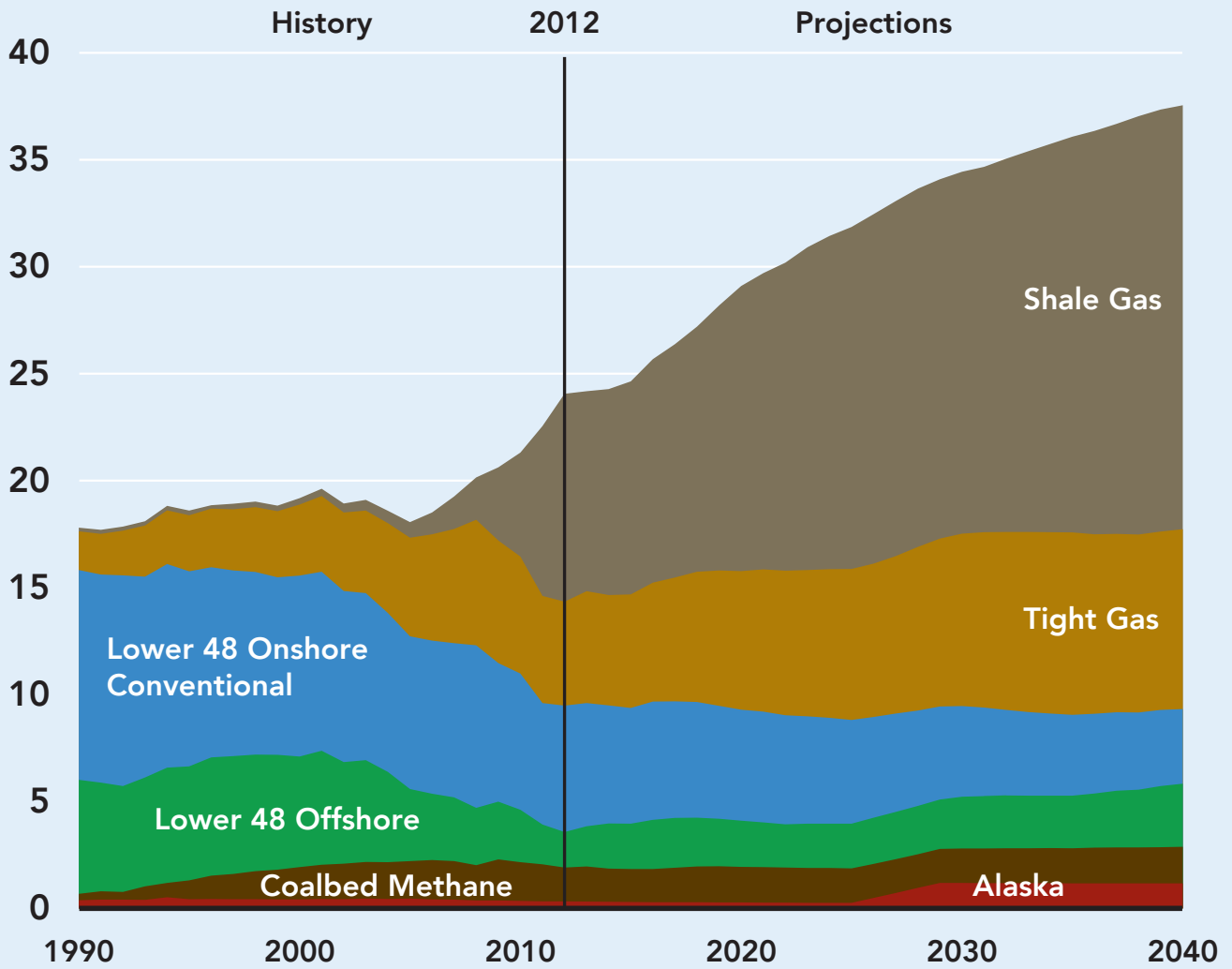
per well and closer well spacing; (2) tight oil development in Alaska; (3) higher estimates of offshore resources in Alaska and the lower 48 states; and (4) higher rates of long-term technology improvement. In the High Resource case, higher well productivity reduces development and production costs per unit, resulting in more and earlier resource development than in the Reference case. With the greater abundance of less-expensive shale gas resources, cumulative shale gas production from 2012 through 2040 totals 540 Tcf, as compared with 442 Tcf in the Reference case. In the Reference case and the High Resource case, total natural gas production in 2040 grows to 37.5 Tcf and 45.5 Tcf per year, respectively.”<sup>9</sup>

Those differing assumptions obviously affect the outlook on U.S. natural gas exports. Under the AEO2014 Reference case, “Net exports of LNG increase by 3.5 Tcf from 2012 to 2040, representing 48% of the total increase in U.S. natural gas net exports over the period.”<sup>10</sup> Net exports reach the 3.5 Tcf annual level just before 2030, and remain at that level. However, under the High Oil and Gas Resource case, “large production increases put downward pressure on U.S. natural gas prices, and as a result LNG exports climb to 5.1 Tcf after 2025.”<sup>11</sup>

Indeed, it is important to keep in mind that when looking ahead projected resources and production in the areas of oil and natural gas usually turn out to be grossly underestimated given innovations and improvements that occur in exploration and production technologies – as has been so glaringly the case with increases in both oil and natural gas production in recent years that were not expected a relatively short time ago.

This revolution in natural gas production – coupled with an increase in U.S. oil production (also due to the extraction technologies of hydraulic fracturing and horizontal drilling being applied, especially in Texas and North Dakota) – has provided considerable growth in the energy sector of our economy in recent years, while the overall economy has grossly underperformed.

Figure 1. U.S. natural gas production by source in the Reference case, 1990-2040



Source: This figure is from the *Annual Energy Outlook 2014*, U.S. Energy Information Administration, May 7, 2014, accessed at [http://www.eia.gov/forecasts/aeo/MT\\_naturalgas.cfm#natgas\\_prices?src=Natural-b1](http://www.eia.gov/forecasts/aeo/MT_naturalgas.cfm#natgas_prices?src=Natural-b1).

As reported by *Bloomberg*, Francisco Blanch, Bank of America's head of commodities research, observed in early July 2014: "There's a very strong linkage between oil production growth, economic growth and wage growth across a range of U.S. states," Blanch said. Annual investment in oil and gas in the country is at a record \$200 billion, reaching 20 percent of the country's total private fixed-structure spending for the first time, he said."

As already noted (and see Table 1), U.S. natural gas marketed production grew by 35 percent between 2005 and 2013.

**Table 1: U.S. Natural Gas Marketed Production**

2005:	18,927.1 billion cubic feet
2013:	25,616.4 billion cubic feet

**Impact on Jobs**

That expansion in production has led to growth in employment in the energy sector, while the overall economy experienced a decline in jobs.

Table 2 compares employment growth (all employment and business data from Census Bureau “County Business Patterns” unless otherwise noted) among employer firms in the overall economy, and in various energy industry sectors.

The difference in the employment story between the energy sector and the overall economy could not be starker. While overall employment fell between 2005 and 2012, jobs grew markedly in the energy sector given the striking expansion in domestic natural gas and oil production.

While U.S. total employment *declined* by 0.3 percent from 2005 to 2012, jobs *grew*:

- by 46.1 percent in the oil and gas extraction sector;<sup>12</sup>
- by 61.0 percent in the drilling oil and gas wells sector;<sup>13</sup>
- by 100.2 percent in the support sector for oil and gas operations;<sup>14</sup>
- by 66.1 percent in the oil and gas pipeline and related structures construction sector;<sup>15</sup>
- and by 67.1 percent in the oil and gas field machinery and equipment manufacturing sector.<sup>16</sup>

While U.S. employers overall shed more than 378,000 jobs over this period, employers in the five energy industries included here directly added more than 293,000 jobs (that is, direct jobs in each sector without factoring in broader indirect jobs tied to expanded production and reduced prices).

**Table 2: Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	116,317,003	115,938,468	-0.3%
Oil/Gas Extraction	85,562	125,001	46.1%
Drilling Oil and Gas Wells	66,084	106,368	61.0%
Support for Oil and Gas Operations	136,038	272,357	100.2%
Oil and Gas Pipeline and Related Structures Construction	86,321	143,383	66.1%
Oil and Gas Field Machinery and Equipment Manufacturing	30,580	51,105	67.1%



## Impact on Small Business

At the same time, and not surprisingly, while the number of businesses (in this case, employer firms) in the nation declined, business growth was strong among key energy sectors. And it is critical to note the role and growth of smaller businesses in these industries.

Table 3 makes clear that expanded production in the energy sector has been a boon for small and midsize enterprises. Or, to look at it from a different angle, expanded energy production has been driven by small and midsize businesses.

For all of the U.S., total employer firms declined by 5.0 percent from 2005 to 2011, including a 4.7 percent decline in firms with less than 20 workers, and a 5.0 percent fall in firms with less than 500 workers. Again, compare those declines to the growth in energy industries over the same period:

- Among oil and gas extraction businesses, the number of employer firms grew by 4.9 percent, including growth of 4.1 percent among firms with less than 20 workers and 4.8 percent among firms with less than 500 workers.
- Among drilling oil and gas wells businesses, the number of employer firms grew by 11.3 percent, including growth of 7.9 percent among firms with less than 20 workers and 11.3 percent among firms with less than 500 workers.
- Among support for oil and gas operations businesses, the number of employer firms grew by 31.3 percent, including growth of 29.1 percent among firms with less than 20 workers and 31.3 percent among firms with less than 500 workers.
- Among oil and gas pipeline and related structures construction businesses, the number of employer firms grew by 14.3 percent, including growth of 12.2 percent among firms with less than 20 workers, and 12.5 percent among firms with less than 500 workers.
- Among oil and gas field machinery and equipment manufacturing businesses, the number of employer firms grew by 15.0 percent, including growth of 8.5 percent among firms with less than 20 workers and 14.7 percent among firms with less than 500 workers.

While the number of U.S. employer firms overall declined by 299,122 over this period, employer firms in the five energy industries included here increased by 2,758.

Table 4 breaks out growth among employer establishments, as opposed to employer firms. As defined by the Census Bureau: "A firm is a business organization consisting of one or more domestic establishments in the same state and industry that were specified under common ownership or control. The firm and the establishment are the same for

single-establishment firms." Meanwhile, an establishment is defined as: "A single physical location where business is conducted or where services or industrial operations are performed."<sup>17</sup> The data for each of the states in the rest of this report is establishment data. Therefore, the following table provides a direct comparison between national and state numbers.

The growth in both jobs and small-midsize employer firms in the energy sector has been striking in recent years, once again especially given the abysmal performance of the overall economy.

**Small firms dominate the energy sector.** Finally, it must be noted that the energy sector in fact is not all about huge enterprises. As noted in Tables 3 and 4, each energy sector looked at here is overwhelmingly populated by small and midsize businesses. Consider the breakdown among firms:

- Among oil and gas extraction businesses, 91.1 percent of employer firms in 2011 had less than 20 workers, and 98.5 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 79.8 percent of employer firms in 2011 had less than 20 workers, and 97.6 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 83.3 percent of employer firms in 2011 had less than 20 workers, and 98.7 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 65.5 percent of employer firms in 2011 had less than 20 workers, and 95.3 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 57.6 percent of employer firms in 2011 had less than 20 workers, and 91.8 percent had fewer than 500 employees.

In looking at the full picture of the impact unconventional oil and natural gas production – that is, "unconventional natural gas extracted from shale formations and from tight sands and unconventional oil extracted from shale and other dense rocks" – on the U.S. economy, IHS found:<sup>18</sup>

- "In 2012, capital expenditures will surpass \$87 billion. These expenditures supporting the growth of unconventional oil and gas activity will reach \$172.5 billion in 2020 and more than \$353 billion in 2035."
- "Over 1.7 million jobs are attributable to unconventional oil and gas development today. These employment contributions are expected to rise to 3 million by the end of the decade and to 3.5 million jobs by 2035."

- “In 2012, unconventional oil and gas will contribute almost \$238 billion in value added to the US economy. This contribution to gross domestic product (GDP) will increase more than 75% by 2020 to over \$416 billion. By the final year of the forecast period, 2035, this will increase to nearly \$475 billion.”

A study by the Manhattan Institute and the Empire Center for New York State Policy offered a powerful look at “the effect of hydrofracturing—at modest, moderate, and high levels—on jobs and income growth in Pennsylvania counties,” including the following findings<sup>19</sup>:

- “Pennsylvania counties with hydrofractured gas wells have performed better across economic indicators than those that have no wells.”
- “The more wells a county contains, the better it performed.”
- “Between 2007 and 2011, per-capita income rose by 19 percent in Pennsylvania counties with more than 200 wells, by 14 percent in counties with between 20 and 200 wells, and by 12 percent in counties with fewer than 20 wells.”
- “In counties without any hydrofractured wells, income went up by only 8 percent.”
- “Counties with the lowest per-capita incomes experienced the most rapid growth.”
- “Counties with more than 200 wells added jobs at a 7 percent annual rate over the same time period.”
- “Where there was no drilling, or only a few wells, the number of county jobs shrank by 3 percent.”

For good measure, the Oil and Natural Gas Industry Labor-Management Committee released a study on October 14, 2014, reporting that “Marcellus shale development in Pennsylvania, Maryland, West Virginia, and Ohio ‘has been a strong engine of job growth’ in the local construction industries in those states.”<sup>20</sup> The author, Dr. Robert Urban, an economist at the University Illinois, looked at data from 2008 to 2014. Regarding the analysis, Urban explained: “The oil and gas industry *direct and indirect* employment data reported in this study is related to natural gas projects drawn from a ‘but for’ perspective. Meaning that “but for’ construction on natural gas projects the employment impact would not have occurred. This report presents the actual labor hours worked for thirteen trades and the estimated construction workers required for all capital and maintenance activities. The following crafts have been selected for this study: Boilermakers, Operating Engineers, Electricians, Pipefitters, Ironworkers, Plumbers, Laborers, Insulators, Carpenters, Sheet Metal Workers, Painters, Plasterers and Masons and Teamsters.” As for key findings:

- Urban concluded: “A preliminary examination of employment data in states related to the Marcellus Shale Play (i.e., Maryland, Virginia, Pennsylvania, Ohio and West Virginia) reveals that natural gas exploration has been a strong engine of job growth. From 2008 to the first half of 2014, over 72 million hours of direct and indirect construction labor has been worked on natural gas and oil projects related to the Marcellus Shale. These hours translate to 36,321 actual construction workers (based on a standard 2,000 hours of work) and engaged in oil and gas work that would not have occurred ‘but for’ natural gas exploration in the Marcellus Shale geological footprint. It is important to note however, that based on a more realistic denominator of 1,600 annual hours of work, the number of actual construction workers is 45,402.”
- For good measure, Urban made clear that without the natural gas exploration and development, oil and gas-related construction jobs in the area would have declined significantly. He wrote: “In addition, an analysis of Marcellus Shale employment data reveals that the expansion of natural gas development first beginning in 2006 and accelerating during the recessionary 2008- 2013 period, has repositioned construction employment in the Oil and Gas Industry. While employment in non-shale related oil and gas industries sharply declined from 2008 forward, employment activity on natural gas projects in the Marcellus Shale Play rose significantly.”
- Finally, Urban makes clear that this is not the full story on Marcellus Shale-related jobs: “It is worth once again stating that this report presents employment data for *actual hours worked* on Marcellus Shale projects from 2008 to the first half of 2014. The analysis does not include any projected or indirect or induced employment impacts.”

**Table 3: Employer Firms – U.S. Total and Energy Industries, 2005-2011**
**U.S. Total Employer Firms**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	5,983,546	5,357,887	5,966,069	89.5%	99.7%
2011	5,684,424	5,104,014	5,666,753	89.8%	99.7%
Chg 05-11	-5.0%	-4.7%	-5.0%		

**Oil/Gas Extraction Employer Firms**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	6,317	5,800	6,230	91.8%	98.6%
2011	6,628	6,036	6,530	91.1%	98.5%
Chg 05-11	4.9%	4.1%	4.8%		

**Drilling Oil and Gas Wells Firms**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	1,833	1,509	1,791	82.3%	97.7%
2011	2,041	1,628	1,993	79.8%	97.6%
Chg 05-11	11.3%	7.9%	11.3%		

**Support for Oil and Gas Operations Firms**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	6,183	5,238	6,101	84.7%	98.7%
2011	8,119	6,761	8,012	83.3%	98.7%
Chg 05-11	31.3%	29.1%	31.3%		

**Oil and Gas Pipeline and Related Structures Construction Firms**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	1,612	1,075	1,561	66.7%	96.8%
2011	1,843	1,207	1,756	65.5%	95.3%
Chg 05-11	14.3%	12.2%	12.5%		

**Oil and Gas Field Machinery and Equipment Manufacturing Firms**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	480	293	442	61.0%	92.1%
2011	552	318	507	57.6%	91.8%
Chg 05-11	15.0%	8.5%	14.7%		

**Table 4: Employer Establishments – U.S. Total and Energy Industries, 2005-2012**

**U.S. Total Employer Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	7,499,702	6,468,179	7,480,989	86.2%	99.8%
2012	7,431,808	6,406,642	7,413,423	86.2%	99.8%
Chg 05-12	-0.9%	-1.0%	-0.9%		

**Oil/Gas Extraction Employer Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	7,390	6,579	7,376	89.0%	99.8%
2012	8,064	6,972	8,042	86.5%	99.7%
Chg 05-12	9.1%	6.0%	9.0%		

**Drilling Oil and Gas Wells Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	2,145	1,688	2,123	78.7%	99.0%
2012	2,539	1,822	2,502	71.8%	98.5%
Chg 05-12	18.4%	7.9%	17.9%		

**Support for Oil and Gas Operations Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	7,206	6,015	7,171	83.5%	99.5%
2012	10,872	8,420	10,818	77.4%	99.5%
Chg 05-12	50.9%	40.0%	50.9%		

**Oil and Gas Pipeline and Related Structures Construction Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	1,717	1,121	1,694	65.3%	98.7%
2012	2,046	1,216	2,006	59.4%	98.0%
Chg 05-12	19.2%	8.5%	18.4%		

**Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	568	319	557	56.2%	98.1%
2012	713	364	699	51.1%	98.0%
Chg 05-12	25.5%	14.1%	25.5%		

# LNG Exports: Expanding Opportunity Further

**As is clear from the trends noted throughout this analysis, advancements in technology have opened up vast resources of natural gas (as well as oil) in shale rock that were previously not accessible. As a result, natural gas prices have plummeted in the U.S. However, prices remain high in other parts of the world and demand is on the rise. Therefore, the potential exists for economic benefits to be derived from exporting LNG.**

As is clear from the trends noted throughout this analysis, advancements in technology have opened up vast resources of natural gas (as well as oil) in shale rock that were previously not accessible. As a result, natural gas prices have plummeted in the U.S. However, prices remain high in other parts of the world and demand is on the rise. Therefore, the potential exists for economic benefits to be derived from exporting LNG.

That is, the trends in terms of expanded investment, entrepreneurship, economic growth and employment that have been highlighted given the expansion of domestic energy production – with our emphasis primarily on natural gas via hydraulic fracturing and horizontal drilling – can be expanded further through global markets for LNG.

Of course, this is how markets work. Prices send signals to producers to expand investment and production. Expanded foreign demand can boost the incomes of U.S. energy entrepreneurs, businesses and workers, with added benefits rippling out through the larger economy. Naturally, businesses must consider costs relative to the potential revenues, and assess the state of current and future competitors to get a full picture of the opportunity.

Arguments have come from certain circles that LNG exports would hurt domestic businesses that use natural gas as an industrial input.

Economics 101, however, reminds us that the economy is not a zero-sum game. Therefore, expanded demand for U.S. natural gas in international markets will result in greater U.S. natural gas production, increased investment, enhanced GDP growth, rising incomes, and more jobs – just as is the case with increasing exports in other U.S. industries, including those that utilize natural gas. As noted in a recent analysis of the LNG export issue published by the Peterson Institute for International Economics:

“Fears of a significant increase in average domestic natural gas prices over a 20-year horizon are no more justified as a reason for limiting US exports of LNG than they would be as a reason for limiting exports of soybeans, corn, coal, or other natural resources. Historically, domestic price stabilization has not been an objective of US export policy. Rather, the

overarching philosophy of a market economy is that prices for individual commodities should be allowed to fluctuate and thereby guide rational production and consumption decisions, both at home and abroad.”<sup>21</sup>

Indeed, if one understands that international trade is mutually beneficial (otherwise, why would the parties participate in the transaction?), and that trade expands opportunity, enhances incentives for investment and expanded production, boosts competition, and increases income and employment, then the idea that government should place barriers on either exports or imports is glaringly absurd. Again, Economics 101 offers the lesson of comparative advantage, taught by the 19th-century economist David Ricardo, showing how trade is an economic positive as businesses, entrepreneurs and workers focus on the endeavors at which they rank as most efficient, and then trade with others for other goods and services. That’s how the domestic and global economies work.

Unsurprisingly, study after study shows how these basic economic principles apply to energy markets. Consider the following examples:

- In “Macroeconomic Impacts of LNG Exports from the United States,” researched and written by NERA Economic Consulting for the Energy Information Administration (December 2012), it was found:

“Across all these scenarios, the U.S. was projected to gain net economic benefits from allowing LNG exports. Moreover, for every one of the market scenarios examined, net economic benefits increased as the level of LNG exports increased. In particular, scenarios with unlimited exports always had higher net economic benefits than corresponding cases with limited exports. In all of these cases, benefits that come from export expansion more than outweigh the losses from reduced capital and wage income to U.S. consumers, and hence LNG exports have net economic benefits in spite of higher domestic natural gas prices. This is exactly the outcome that economic theory describes when barriers to trade are removed. Net benefits to the U.S. would be highest if the U.S. becomes able to produce large quantities of gas from shale at low cost, if world demand for natural gas

increases rapidly, and if LNG supplies from other regions are limited.”<sup>22</sup>

- In October 2014, the U.S. Energy Information Administration released findings from a follow-up study titled “Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets,” again estimating some key effects of increasing LNG exports from the United States.<sup>23</sup> It is correctly noted in the report that “projections of energy markets over a 25-year period are highly uncertain and subject to many events that cannot be foreseen, such as supply disruptions, policy changes, and technological breakthroughs.” At the same time, though, a basic understanding of economics, as well as economic history, can provide a clear direction on the impact of certain economic and policy changes. For example, there’s little dispute as to what increased exports – in this case, LNG exports – would mean for the U.S. economy. As noted in the report:

**“Added U.S. LNG exports result in higher levels of economic output, as measured by real gross domestic product as (GDP).** Increased energy production spurs investment, which more than offsets the adverse impact of somewhat higher energy prices when the export scenarios are applied. Economic gains, measured as changes in the level of GDP relative to baseline, range from 0.05% to 0.17% and generally increase with the amount of added LNG exports required to fulfill an export scenario for the applicable baseline... EIA’s NEMS model is focused on the U.S. energy system and the domestic economy and does not address several key international linkages that may increase economic benefits.”

While the full impact on economic growth can be debated, such estimates are expected and make economic sense, given that increased exports add to economic growth. But what about that reference to “somewhat higher energy prices,” which has generated a rash of irrational responses, again including the very strange notion that the U.S. should act to restrict LNG exports – and thereby, by the way, restrict U.S. economic growth? According to this study, the effect of LNG exports on producer prices over the period of 2015-40 are estimated at between 4 percent and 11 percent for producers, and between 2 percent and 5 percent for residential consumers. Those estimates come against baseline assumptions, and obviously cannot fully account, as already noted, for expanded natural gas production domestically and around the globe due to policy changes and technological changes, not to mention production of other energy sources. For good measure, any possible price increases from this point in time must be placed in proper context, that is against the 57 percent decline in the annual average price of natural gas in the U.S. occurring from 2005 to 2013.

- In “Made in America: The economic impact of LNG exports from the United States,” from Deloitte Center for Energy Solutions and Deloitte MarketPoint LLC (2011), it was reported: “Given the model’s assumptions, the WGM projects a weighted-average price impact of \$0.12 per million British thermal units (MMBtu) on U.S. prices from 2016 to 2035 as a result of the 6 Bcfd of LNG exports. The \$0.12/MMBtu increase represents a 1.7% increase in the projected average U.S. citygate gas price of \$7.09/MMBtu over this time period.”<sup>24</sup>

Given this small projected price rise, a follow-up captured the nature of how the market works: “The results show that the North American gas market is dynamic. If exports can be anticipated, and clearly they can with the public application process and long lead time required to construct a LNG liquefaction plant, then producers, midstream players, and consumers can act to mitigate the price impact. Producers will bring more supplies online, flows will be adjusted, and consumers will react to price change resulting from LNG exports.”<sup>25</sup>

- That point about the dynamism of the market was emphasized in a study titled “Liquid Markets: Assessing the Case for U.S. Exports of Liquefied Natural Gas,” written by Charles Ebinger, Kevin Massy, and Govinda Avasarala, for the Brookings Institution in May 2012. The authors observed: “Shale gas technologies and production processes have been developing rapidly in recent years, improving the economics of extraction. Companies now are drilling longer laterals and are increasing the number of frack stages—the number of different fracking sections in each lateral section—per well, leading to an increase in available reserves and well productivity. An analysis of well-specific-data illustrates that both initial production rates and ultimate well recovery have been growing across all production regions (or ‘plays’), thereby driving down per unit costs of production.”<sup>26</sup>

Ebinger, Massy and Avasarala summed up a critical point when it comes to how increased demand via new exports markets would be met: “In their analyses, both Deloitte and EIA found that the majority—63 percent, according to both studies—of the exported natural gas will come from new production as opposed to displaced consumption from other sectors.”<sup>27</sup>

- A Brookings Institution study looked at the production and export of natural gas liquids. As noted in the report: “[O]ne important aspect of the U.S. unconventional oil and gas ‘revolution,’ has gone relatively unnoticed: the rapid increase in the production of natural gas liquids (NGLs). NGLs comprise a number of hydro-carbon products that are produced in conjunction with methane (also known as ‘dry’ natural gas), or as a byproduct of crude oil refining, and which are liquid at room temperature. NGLs include



ethane, propane, butane, isobutane, and natural gasoline. While such commodities do not attract the attention that is shown to crude oil, gasoline, or natural gas, they are a critical component of the industrial sector's ability to take advantage of the U.S. hydro-carbon resurgence, and will play a large role in the country's ambitions for energy 'self-sufficiency.'"<sup>28</sup>

On the export issue, the authors point out:

"Just as the U.S. has become a net exporter of refined petroleum products and is a potential exporter of liquefied natural gas (LNG), it has also become a net exporter of NGLs and petrochemical products, such as propane and propylene... NGL exports, which are occurring as a result of an excess in domestic supply and weak demand from the petrochemical sector, are growing increasingly important for sustaining domestic NGL—and dry natural gas—production. Further, the need for an outlet for NGL supplies is met with growing demand for propane and other liquids, which are critical for heating and cooking in a number of emerging economies, including India and Central and South America..."

"Exporting NGLs will provide producers an incentive to maintain production of both NGLs and, in turn, dry natural gas. Further, many investors see exports as a critical component to smoothing the price volatility that characterizes the NGL market. More important than the current surge in investments in U.S. manufacturing is the assurance of a predictable supply of NGLs, something provided by increase NGL export."<sup>29</sup>

- After reviewing the available research, Margo Thorning, chief economist for the American Council for Capital Formation, concluded that "the preponderance of the economic analyses of the impact exports of LNG from the U.S. show positive overall benefits in terms of jobs, investment and GDP growth. In addition, the impact on U.S. domestic natural gas prices rises will be relatively small, thus allowing U.S. customers to maintain a strong competitive advantage over our trading partners."<sup>30</sup>

For good measure, the study from the Peterson Institute made an important counterpoint to one pessimistic point put forth by the NERA study.

It was stated in the NERA study, "LNG exports are not likely to affect the overall level of employment in the U.S. There will be some shifts in the number of workers across industries, with those industries associated with natural gas production and exports attracting workers away from other industries."<sup>31</sup>

In no scenario is the shift in employment out of any industry projected to be larger than normal rates of turnover of employees in those industries.

"However, it is countered in the Peterson Institute study: "The NERA model assumes that the economy operates

at full employment. In reality, the American economy has not been operating at full employment for four years and this condition is expected to last at least through 2015. For this reason, the potential employment benefits from larger natural gas production may be understated in the NERA report. By the same token, if lower gas prices spurred new investment in chemical or power plants, that too would reduce the unemployment rolls."<sup>32</sup>

## **Expanded foreign demand can boost the incomes of U.S. energy entrepreneurs, businesses and workers, with added benefits rippling out through the larger economy.**

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In the end, the expectation that nearly two-thirds of LNG exports would be met via new production – and within the context of recent and expected growth in natural gas production – speaks to further strong growth for small and midsize businesses, and for employment. At the same time, the minimal price impact that expanded exports might have on domestic prices would have small effects on domestic consumers of natural gas – especially given the enormous declines we've already experienced in natural gas prices. And even those small, potential price increases must be further offset against the effect of the overall positive for economic growth coming via generally lower natural gas prices and expanded natural gas production.

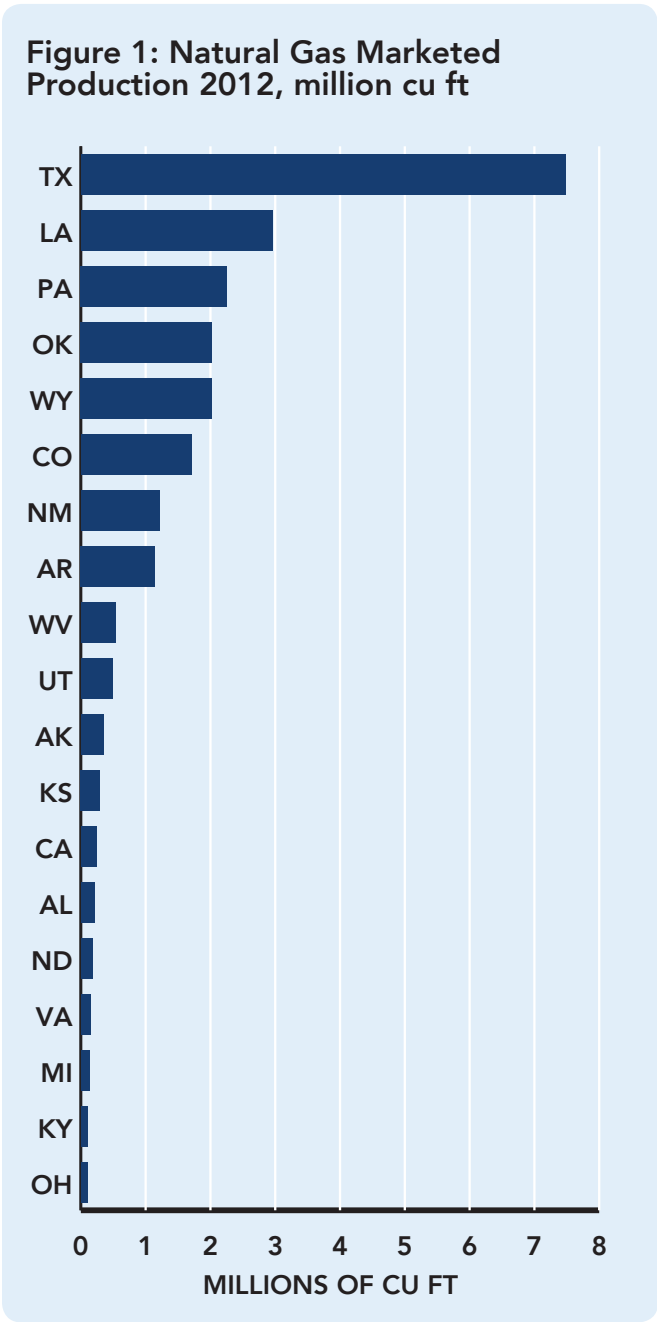
Recall the tremendous growth in energy sector employment due to expanded domestic natural gas and oil production, as cited throughout this report, versus the decline in overall U.S. jobs. Also, consider that growth state by state in energy sectors in the following pages, again versus the dismal overall job market.

Consider the growth in the number of small and midsize businesses experienced nationally and in key states due to expanded energy production, and compare those to the overall decline in the U.S. economy. And again, keep in mind that these energy sectors are overwhelmingly populated by those small and midsize firms.

Given these economic realities, allowing for LNG exports to be guided by market forces – as opposed to political preferences and lobbying – means expanding the potential opportunity for small and midsize businesses to be created, to grow, and to create jobs. Any politically driven efforts to limit exports, therefore, would limit the creation, growth and job-creating abilities of those small and midsize businesses that populate the energy industry.

# The States: Energy-Sector Growth and Opportunity

Now let's consider the developments in key states experiencing expanded opportunities on the natural gas production front. Figure 1 provides a look at natural gas marketed production in the top 19 producing states for 2012. In the following pages, details are provided for each of these states in terms of natural gas production, employment in key energy sectors, and business establishment growth and size data in each of those sectors as well.



The states profiles are presented alphabetically, but the following breaks the states out as being growth states, declining states or mixed states in terms of the recent trend in natural gas production.

### Growth States

- Arkansas
- Colorado
- Louisiana
- North Dakota
- Ohio
- Oklahoma
- Pennsylvania
- Texas
- Utah
- Virginia
- West Virginia
- Wyoming

### Declining States

- Alabama
- Alaska
- California
- Michigan
- New Mexico

### Mixed States

- Kentucky

The benefits of being a growth state in terms of natural gas production are clear. In fact, among the 12 growth states in the following pages, all experienced growth in jobs and in the number of small and midsize businesses within the key energy sectors examined, with growth being particularly robust in ten of those states. For good measure, even in the states where natural gas production has declined in recent years, it is interesting to note that there still can be significant contributions made to state economies from these energy sectors.

Again, LNG exports would further enhance incentives for natural gas production in the states, with commensurate benefits being accrued in terms of economic, employment, business, and income growth. It is worth repeating that the lone real obstacle to this tremendous opportunity is government policy going awry, whether that be misguided limits on or obstacles to U.S. exports, or wrongheaded and costly tax and/or regulatory burdens or schemes imposed on carbon-based energy production at the national level or in the states.



# I. Alabama and Natural Gas: Declining State

Natural gas production in Alabama declined by 27.3 percent from 2005 to 2012, and actually has been falling since 1996. However, it also must be noted that after a long decline, crude oil production grew from 2010 to 2013.

**Table 5: Alabama Natural Gas Marketed Production**

2005:	296.5 billion cubic feet
2012:	215.7 billion cubic feet

## Impact on Jobs

Table 6 compares employment growth (again, all employment and business data from Census Bureau “County Business Patterns” unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors.

While overall employment fell between 2005 and 2012, jobs managed to grow in two of three energy sectors for which we have complete data.

Alabama total employment *declined* by 4.9 percent from 2005 to 2012, but jobs *grew*:

- by 4.3 percent in the oil and gas extraction sector;
- and by 31.3 percent in the support sector for oil and gas operations.

**Table 6: Alabama Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	1,667,526	1,585,761	-4.9%
Oil/Gas Extraction	489	510	4.3%
Drilling Oil and Gas Wells	NA	280	NA
Support for Oil and Gas Operations	687	902	31.3%
Oil and Gas Pipeline and Related Structures Construction	3,950	1,805	-54.3%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	NA	NA

## Impact on Small Business

While the number of businesses (in this case, establishments) declined in the nation and in Alabama, the number of establishments grew in three of five energy sectors examined here. And it is critical to note the role and growth of smaller businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2012, including a 1.0 percent decline in establishments with less than 20 workers, and a 0.9 percent fall in establishments with less than 500 workers.

In Alabama, total establishments declined by 4.0 percent, including a 4.0 percent fall among establishments with less than 20 workers, and a 3.9 percent decline among those with less than 500 workers.

However, there was growth in certain energy sectors:

- Among oil and gas extraction businesses, the number of employer establishments grew by 2.8 percent, including growth of 3.8 percent among those with less than 20 workers and 2.8 percent among establishments with less than 500 workers.
- Among oil and gas pipeline and related structures construction establishments, the number of employer establishments grew by 14.7 percent, including growth of 18.2 percent among establishments with less than 20 workers, and 18.2 percent among those with less than 500 workers.

Finally, it must be noted that the Alabama energy sector is not all about big energy businesses. As noted in Table 7, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 73.0 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 71.4 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas operations businesses, 72.0 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 66.7 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 50.0 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 7: Establishments – Alabama Total and Energy Industries, 2005-2012**

**Alabama Total Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	101,976	86,944	101,677	85.3%	99.7%
2012	97,938	83,485	97,673	85.2%	99.7%
AL 05-12	-4.0%	-4.0%	-3.9%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Alabama Oil/Gas Extraction Employer Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	36	26	36	72.2%	100%
2012	37	27	37	73.0%	100%
Chg 05-12	2.8%	3.8%	2.8%		

**Alabama Drilling Oil and Gas Wells Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	20	16	20	80.0%	100%
2012	14	10	14	71.4%	100%
Chg 05-12	-30.0%	-37.5%	-30.0%		

**Alabama Support for Oil and Gas Operations Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	53	43	53	81.1%	100%
2012	50	36	50	72.0%	100%
Chg 05-12	-5.7%	-16.3%	-5.7%		

**Alabama Oil and Gas Pipeline and Related Structures Construction Establishments**

	Number of Employees		As Percent of Total Establishments		
	Total	Less 20	Less 500	Less 20	Less 500
2005	34	22	33	64.7%	97.1%
2012	39	26	39	66.7%	100%
Chg 05-12	14.7%	18.2%	18.2%		

**Alabama Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	Number of Employees		As Percent of Total Establishments		
	Total	Less 20	Less 500	Less 20	Less 500
2005	1	0	1	0.0%	100%
2012	2	1	2	50.0%	100%
Chg 05-12	100.0%	NA	100.0%		

## II. Alaska and Natural Gas: Declining State

Natural gas production grew into the mid-1990s in Alaska. It then basically leveled off for about a decade, and then began declining after 2005. From 2005 to 2013, natural gas marketed production in the state fell by 30.6 percent. Also, it should be noted that crude oil production in the state has been on a slow, but steady decline since the late 1980s.

**Table 8: Alaska Natural Gas Marketed Production**

2005:	487.3 billion cubic feet
2013:	338.0 billion cubic feet

### Impact on Jobs

Table 9 compares employment growth (again, all employment and business data from Census Bureau "County Business Patterns" unless otherwise noted) among employer

establishments in the overall state, and in various energy industry sectors. Unfortunately, much of the employment data for the state was unavailable. The one sector for which numbers were available, jobs actually grew by 82.2 percent in the support sector for oil and gas operations.

**Table 9: Alaska Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	231,088	258,219	11.7%
Oil/Gas Extraction	1,450	NA	NA
Drilling Oil and Gas Wells	NA	NA	NA
Support for Oil and Gas Operations	3,385	6,168	82.2%
Oil and Gas Pipeline and Related Structures Construction	1,332	NA	NA
Oil and Gas Field Machinery and Equipment Manufacturing	NA	NA	NA

## Impact on Small Business

While the number of businesses (in this case, establishments) declined in the nation, the number of establishments grew strongly in Alaska, including in some key energy sectors. And it is critical to note the role and growth of smaller businesses.

As noted in Table 10, for all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2012, including a 1.0 percent decline in establishments with less than 20 workers, and a 0.9 percent fall in establishments with less than 500 workers.

In Alaska, total establishments grew by 3.1 percent, including a 2.2 percent increase among establishments with less than 20 workers, and a 3.1 percent increase among those with less than 500 workers.

Consider growth in key energy industries in Alaska:

- Among oil and gas extraction businesses, the number of employer establishments grew by 31.6 percent, including growth of 10.0 percent among those with less than 20 workers and 33.3 percent among establishments with less than 500 workers.
- Among drilling oil and gas wells businesses, the number of employer establishments grew by 33.3 percent, including growth of 100.0 percent among establishments with less than 20 workers and 33.3 percent among establishments with less than 500 workers.
- Among support for oil and gas operations businesses, the number of employer establishments grew by 14.3 percent, including growth of 11.1 percent among establishments with less than 20 workers and 9.1 percent among establishments with less than 500 workers.

Finally, it must be noted that the Alaska energy sector is not all about big energy businesses. As noted in Table 10, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 44.0 percent of employer establishments in 2012 had less than 20 workers, and 96.0 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 50.0 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 50.0 percent of employer establishments in 2012 had less than 20 workers, and 90.0 percent had fewer than 500 employees.
- Among support for oil and gas pipeline and related structures construction businesses, 60.0 percent of employer establishments in 2012 had less than 20 workers, and 100.0 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 50.0 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 10: Establishments – Alaska Total and Energy Industries, 2005-2012**

**Alaska Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	19,808	17,723	19,770	89.4%	99.8%
2012	20,427	18,111	20,387	88.7%	99.8%
AK 05-12	3.1%	2.2%	3.1%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Alaska Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	19	10	18	52.6%	94.7%
2012	25	11	24	44.0%	96.0%
Chg 05-12	31.6%	10.0%	33.3%		

**Alaska Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	9	3	9	33.3%	100%
2012	12	6	12	50.0%	100%
Chg 05-12	33.3%	100.0%	33.3%		

**Alaska Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	35	18	33	51.4%	94.3%
2012	40	20	36	50.0%	90.0%
Chg 05-12	14.3%	11.1%	9.1%		

**Alaska Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	20	15	19	78.9%	95.0%
2012	15	9	15	60.0%	100%
Chg 05-12	-25.0%	-4.0%	-21.1%		

**Alaska Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	1	0	1	0.0%	100%
2012	2	1	2	50.0%	100%
Chg 05-12	100.0%	NA	100.0%		

### III. Arkansas and Natural Gas: Growth State

The increase in natural gas production has been dramatic in Arkansas via the Fayetteville Shale area. The state’s natural gas production, as highlighted in Table 11, expanded by 501.7 percent from 2005 to 2012.

**Table 11: Arkansas Natural Gas Marketed Production**

2005:	190.5 billion cubic feet
2012:	1,146.2 billion cubic feet

#### Impact on Jobs

Table 12 compares employment growth (again, all employment and business data from Census Bureau “County Business Patterns” unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors. The difference in the employment story between the energy sector and the overall economy is striking.

While overall employment fell between 2005 and 2012, jobs grew markedly in the energy sector given the expansion in energy production.

Arkansas total employment *declined* by 3.8 percent from 2005 to 2012, but jobs *grew*:

- by 125.1 percent in the oil and gas extraction sector;
- by 220.2 percent in the drilling oil and gas wells sector;
- by 388.0 percent in the support sector for oil and gas operations;
- and by 183.7 percent in the oil and gas pipeline and related structures construction sector.

While Arkansas employers overall shed 38,905 jobs over this period, employers in the four energy industries (where data was available) included here added more than 6,500 jobs (that is, direct jobs in each sector without factoring in broader indirect jobs tied to expanded production and reduced prices).

**Table 12: Arkansas Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	1,017,424	978,519	-3.8%
Oil/Gas Extraction	637	1,434	125.1%
Drilling Oil and Gas Wells	692	2,216	220.2%
Support for Oil and Gas Operations	817	3,987	388.0%
Oil and Gas Pipeline and Related Structures Construction	588	1,668	183.7%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	NA	NA

## Impact on Small Business

At the same time, while the number of businesses (in this case, establishments) declined in the nation and in Arkansas, the number of establishments grew strongly among Arkansas' energy sector. And it is critical to note the role and growth of smaller businesses.

Table 13 makes clear that expanded production in the energy sector, for the most part, has been a boon for small and midsize enterprises in the state. Or, to look at it from a different angle, expanded energy production has been driven by small and midsize businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2012, including a 1.0 percent decline in establishments with less than 20 workers, and a 0.9 percent fall in establishments with less than 500 workers.

In Arkansas, total establishments declined by 1.9 percent, including a 2.4 percent fall among establishments with less than 20 workers, and a 1.8 percent decline among those with less than 500 workers.

But compare those declines to the growth in these energy industries in Arkansas:

- Among oil and gas extraction businesses, the number of employer establishments grew by 19.1 percent, including growth of 9.5 percent among those with less than 20 workers and 19.1 percent among establishments with less than 500 workers.
- Among drilling oil and gas wells businesses, the number of employer establishments grew by 43.8 percent, including growth of 20.0 percent among establishments with less than 20 workers and 43.8 percent among establishments with less than 500 workers.
- Among support for oil and gas operations businesses, the number of employer establishments grew by 71.3 percent, including growth of 33.7 percent among establishments with less than 20 workers and 71.3 percent among establishments with less than 500 workers.

The growth in both jobs and small-midsize employer establishments in the energy sector has been striking in recent years, especially given the abysmal performance of the overall economy.

Finally, it must be noted that the Arkansas energy sector is not all about big energy businesses. As noted in Table 13, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 86.8 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees. Among drilling oil and gas wells businesses, 65.2 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 74.5 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 41.3 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.



**Table 13: Establishments – Arkansas Total and Energy Industries, 2005-2012**

**Arkansas Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	66,039	57,236	65,844	86.7%	99.7%
2012	64,815	55,857	64,655	86.2%	99.8%
AR 05-12	-1.9%	-2.4%	-1.8%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Arkansas Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	89	84	89	94.4%	100%
2012	106	92	106	86.8%	100%
Chg 05-12	19.1%	9.5%	19.1%		

**Arkansas Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	32	25	32	78.1%	100%
2012	46	30	46	65.2%	100%
Chg 05-12	43.8%	20.0%	43.8%		

**Arkansas Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	87	83	87	95.4%	100%
2012	149	111	149	74.5%	100%
Chg 05-12	71.3%	33.7%	71.3%		

**Arkansas Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	30	20	30	66.7%	100%
2012	29	12	29	41.3%	100%
Chg 05-12	-3.3%	-40.0%	-3.3%		

**Arkansas Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	1	0	1	0%	100%
2012	NA	NA	NA	NA	NA
Chg 05-12	NA	NA	NA		

## IV. California and Natural Gas: Declining State

Natural gas production in California has been on a rather steady decline since the late 1960s. From 2005 to 2012, natural gas marketed production fell by 22.3 percent. In addition, crude oil production in the state declined from the mid-1980s to 2011, with some growth registering in 2012 and 2013.

**Table 14: California Natural Gas Marketed Production**

2005:	317.6 billion cubic feet
2012:	246.8 billion cubic feet

### Impact on Jobs

Table 15 compares employment growth (again, all employment and business data from Census Bureau "County Business Patterns" unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors. The difference in the employment story between the energy sector and the overall economy is striking.

While overall employment fell between 2005 and 2012, jobs grew markedly in the energy sector even with the decline in natural gas production.

California total employment *declined* by 3.2 percent from 2005 to 2012, but jobs *grew*:

- by 68.9 percent in the oil and gas extraction sector;
- by 140.1 percent in the drilling oil and gas wells sector;
- by 17.0 percent in the support sector for oil and gas operations;
- and by 66.9 percent in the oil and gas pipeline and related structures construction sector.

While California employers overall shed 429,652 jobs over this period, employers in the four energy industries (where data was available) included here added 9,669 jobs (that is, direct jobs in each sector without factoring in broader indirect jobs tied to expanded production and reduced prices).

**Table 15: California Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	13,382,470	12,952,818	-3.2%
Oil/Gas Extraction	3,955	6,679	68.9%
Drilling Oil and Gas Wells	1,996	4,793	140.1%
Support for Oil and Gas Operations	6,504	7,609	17.0%
Oil and Gas Pipeline and Related Structures Construction	4,551	7,594	66.9%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	1,706	NA

## Impact on Small Business

At the same time, while the number of businesses (in this case, establishments) declined in the nation, the number of establishments grew in California, but particularly in energy sectors. And it is critical to note the role and growth of smaller businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2012, including a 1.0 percent decline in establishments with less than 20 workers, and a 0.9 percent fall in establishments with less than 500 workers.

In California, as noted in Table 16, total establishments increased by 0.5 percent, including a 1.4 percent increase among establishments with less than 20 workers, and a 0.5 percent increase among those with less than 500 workers.

But compare those to the growth in these energy industries in California:

- Among oil and gas extraction businesses, the number of employer establishments grew by 15.7 percent, including growth of 11.5 percent among those with less than 20 workers and 14.7 percent among establishments with less than 500 workers.
- Among drilling oil and gas wells businesses, the number of employer establishments grew by 16.9 percent, including growth of 12.2 percent among establishments with less than 20 workers and 12.3 percent among establishments with less than 500 workers.
- Among support for oil and gas operations businesses, the number of employer establishments grew by 6.6 percent, including growth of 6.7 percent among establishments with less than 500 workers.
- Among oil and gas extraction businesses, 79.2 percent of employer establishments in 2012 had less than 20 workers, and 98.6 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 72.4 percent of employer establishments in 2012 had less than 20 workers, and 96.1 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 70.9 percent of employer establishments in 2012 had less than 20 workers, and 98.8 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 83.4 percent of employer establishments in 2012 had less than 20 workers, and 97.9 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 55.2 percent of employer establishments in 2012 had less than 20 workers, and 96.6 percent had fewer than 500 employees.

The growth in both jobs and small-midsize employer establishments in the energy sector has been striking in recent years, especially given the abysmal performance of the overall economy.

Finally, it must be noted that the California energy sector is not all about big energy businesses. As noted in Table 16, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

**Table 16: Establishments – California Total and Energy Industries, 2005-2012**
**California Total Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	860,866	738,392	858,844	85.8%	99.8%
2012	864,913	748,525	862,979	86.5%	99.8%
CA 05-12	0.5%	1.4%	0.5%		
US 05-12	-0.9%	-1.0%	-0.9%		

**California Oil/Gas Extraction Employer Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	191	157	190	82.2%	99.5%
2012	221	175	218	79.2%	98.6%
Chg 05-12	15.7%	11.5%	14.7%		

**California Drilling Oil and Gas Wells Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	65	49	65	75.4%	100%
2012	76	55	73	72.4%	96.1%
Chg 05-12	16.9%	12.2%	12.3%		

**California Support for Oil and Gas Operations Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	228	177	225	77.6%	98.7%
2012	243	172	240	70.9%	98.8%
Chg 05-12	6.6%	-2.8%	6.7%		

**California Oil and Gas Pipeline and Related Structures Construction Establishments**

	Total	Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	107	78	105	72.9%	98.1%
2012	145	121	142	83.4%	97.9%
Chg 05-12	35.5%	55.1%	35.2%		

**California Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	Total	Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	30	22	30	73.3%	100%
2012	29	16	28	55.2%	96.6%
Chg 05-12	-3.3%	-27.2%	-6.7%		

## V. Colorado: Growth State

The increase in natural gas production has been notable in Colorado. The state’s natural gas production, as highlighted in Table 17, expanded by 139.1 percent from 2005 to 2012. Interestingly, natural gas production in the state has been rising since the late 1980s. In addition, crude oil production has been on the rise since 2001, with growth particularly noteworthy since 2010.

**Table 17: Colorado Natural Gas Marketed Production**

2005:	1,133.1 billion cubic feet
2012:	1,709.4 billion cubic feet

### Impact on Jobs

Table 18 compares employment growth (again, all employment and business data from Census Bureau “County Business Patterns” unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors. The difference in the employment story between the energy sector and the overall economy is impressive.

While overall employment grew between 2005 and 2012 in Colorado – compared to a decline in the U.S. overall – jobs grew markedly in the energy sector given the expansion in energy production.

While U.S. total employment *declined*, Colorado total employment *grew* by 5.1 percent from 2005 to 2012. On the energy front, jobs *grew*:

- by 78.7 percent in the oil and gas extraction sector;
- by 71.9 percent in the drilling oil and gas wells sector;
- by 153.4 percent in the support sector for oil and gas operations.
- and by 42.2 percent in the oil and gas pipeline and related structures construction sector.

While Colorado employers overall added 99,539 jobs over this period, employers in the four energy industries (where data was available) included here added 12,461 jobs (that is, direct jobs in each sector without factoring in broader indirect jobs tied to expanded production and reduced prices).

**Table 18: Colorado Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	1,936,264	2,035,803	5.1%
Oil/Gas Extraction	4,060	7,254	78.7%
Drilling Oil and Gas Wells	2,678	4,603	71.9%
Support for Oil and Gas Operations	4,381	11,101	153.4%
Oil and Gas Pipeline and Related Structures Construction	1,473	2,095	42.2%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	186	NA

## Impact on Small Business

At the same time, while the number of businesses (in this case, establishments) in the nation declined, in Colorado, the number of establishments grew, and they expanded robustly in the state's energy sector. And it is critical to note the role and growth of smaller businesses.

Table 19 makes clear that expanded production in the energy sector has been a boon for small and midsize enterprises in the state. Or, to look at it from a different angle, expanded energy production has been driven by small and midsize businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2012, including a 1.0 percent decline in establishments with less than 20 workers, and a 0.9 percent fall in establishments with less than 500 workers.

In Colorado, total establishments increased by 1.4 percent, including a 1.3 percent increase among establishments with less than 20 workers, and a 1.4 percent rise among those with less than 500 workers.

Again, compare the U.S. decline to the growth in these energy industries in Colorado:

- Among oil and gas extraction businesses, the number of employer establishments grew by 15.7 percent, including growth of 14.2 percent among establishments with less than 20 workers and 15.2 percent among establishments with less than 500 workers.
- Among drilling oil and gas wells businesses, the number of employer establishments grew by 18.6 percent, including growth of 9.5 percent among establishments with less than 20 workers and 16.4 percent among establishments with less than 500 workers.
- Among support for oil and gas operations businesses, the number of employer establishments grew by 61.4 percent, including growth of 58.0 percent among establishments with less than 20 workers and 68.9 percent among establishments with less than 500 workers.

- Among oil and gas pipeline and related structures construction businesses, the number of employer establishments grew by 28.0 percent, including growth of 34.3 percent among establishments with less than 20 workers and 28.0 percent among those with less than 500 workers.
- Among oil and gas field machinery and equipment manufacturing businesses, the number of employer establishments grew by 120.0 percent, including growth of 166.7 percent among establishments with less than 20 workers and 120.0 percent among those with less than 500 workers.

The growth in both jobs and small-midsize employer establishments in the energy sector has been noteworthy, again especially given the abysmal performance of the overall economy.

Finally, it must be noted that the Colorado energy sector in fact is not all about huge enterprises. As noted in Table 19, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 86.9 percent of employer establishments in 2012 had less than 20 workers, and 99.5 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 67.6 percent of employer establishments in 2012 had less than 20 workers, and 97.1 percent had fewer than 500 employees.
- Among oil and gas operations businesses, 82.5 percent of employer establishments in 2012 had less than 20 workers, and 99.5 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 73.4 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 72.7 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 19: Establishments – Colorado Total and Energy Industries, 2005-2012**

**Colorado Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	151,070	133,125	150,799	88.1%	99.8%
2012	153,112	135,007	152,818	88.2%	99.8%
CO 05-12	1.4%	1.4%	1.3%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Colorado Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	369	325	369	88.1%	100%
2012	427	371	425	86.9%	99.5%
Chg 05-12	15.7%	14.2%	15.2%		

**Colorado Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	86	63	85	73.3%	98.8%
2012	102	69	99	67.6%	97.1%
Chg 05-12	18.6%	9.5%	16.4%		

**Colorado Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	355	317	354	89.3%	99.7%
2012	601	496	598	82.5%	99.5%
Chg 05-12	61.4%	58.0%	68.9%		

**Colorado Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	50	35	50	70.0%	100%
2012	64	47	64	73.4%	100%
Chg 05-12	28.0%	34.3%	28.0%		

**Colorado Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	5	3	5	60.0%	100%
2012	11	8	11	72.7%	100%
Chg 05-12	120.0%	166.7%	120.0%		

## VI. Kansas and Natural Gas: Declining State

Natural gas production in Kansas has been on a general, though uneven, decline since the late 1970s. From 2005 to 2012, natural gas marketed production declined by 12.1 percent. However, it must also be pointed out that crude oil production in the state has been growing since 1999, with stepped up growth in 2012 and 2013.

**Table 20: Kansas Natural Gas Marketed Production**

2005:	337.2 billion cubic feet
2012:	296.3 billion cubic feet

### Impact on Jobs

Table 21 compares employment growth (again, all employment and business data from Census Bureau “County Business Patterns” unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors. The difference in the employment story between the energy sector and the overall economy is striking.

While overall employment fell between 2005 and 2012 for the nation, jobs grew in Kansas, especially in some

key energy sectors even with the decline in natural gas production.

Kansas total employment grew by 1.6 percent from 2005 to 2012, but jobs grew markedly in the following sectors:

- by 76.8 percent in the drilling oil and gas wells sector;
- by 58.3 percent in the support sector for oil and gas operations;
- and by 9.8 percent in the oil and gas pipeline and related structures construction sector.

**Table 21: Kansas Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	1,116,216	1,134,216	1.6%
Oil/Gas Extraction	2,661	2,550	-4.2%
Drilling Oil and Gas Wells	1,382	2,444	76.8%
Support for Oil and Gas Operations	2,611	4,132	58.3%
Oil and Gas Pipeline and Related Structures Construction	1,060	1,164	9.8%
Oil and Gas Field Machinery and Equipment Manufacturing	59	NA	NA



## Impact on Small Business

At the same time, while the number of businesses (in this case, establishments) declined in the nation and in Kansas, the number of establishments grew strongly among some key Kansas energy sectors. And it is critical to note the role and growth of smaller businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2012, including a 1.0 percent decline in establishments with less than 20 workers, and a 0.9 percent fall in establishments with less than 500 workers.

In Kansas, as noted in Table 21, total establishments declined by 2.9 percent, including a 3.5 percent fall among establishments with less than 20 workers, and a 2.9 percent decline among those with less than 500 workers.

But compare these to the growth in the following energy industries in Kansas:

- Among oil and gas extraction businesses, the number of employer establishments grew by 7.5 percent, including growth of 6.4 percent among those with less than 20 workers and 7.5 percent among establishments with less than 500 workers.
- Among drilling oil and gas wells businesses, the number of employer establishments grew by 50.0 percent, including growth of 37.9 percent among establishments with less than 20 workers and 50.0 percent among establishments with less than 500 workers.
- Among support for oil and gas operations businesses, the number of employer establishments grew by 16.1 percent, including growth of 13.3 percent among establishments with less than 20 workers and 16.1 percent among establishments with less than 500 workers.
- Among support for oil and gas field machinery and equipment manufacturing businesses, the number of employer establishments grew by 100 percent, including growth of 80.0 percent among establishments with less than 20 workers and 100 percent among establishments with less than 500 workers.

Finally, it must be noted that the Kansas energy sector is not all about big energy businesses. As noted in Table 22, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 91.9 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 74.0 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 89.7 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 66.7 percent of employer establishments in 2012 had less than 20 workers, and 96.3 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 75.0 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 22: Establishments – Kansas Total and Energy Industries, 2005-2012**

**Kansas Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	76,173	65,796	76,018	86.4%	99.8%
2012	73,944	63,519	73,786	85.9%	99.8%
KS 05-12	-2.9%	-3.5%	-2.9%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Kansas Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	389	361	389	92.8%	100%
2012	418	384	418	91.9%	100%
Chg 05-12	7.5%	6.4%	7.5%		

**Kansas Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	82	66	82	80.5%	100%
2012	123	91	123	74.0%	100%
Chg 05-12	50.0%	37.9%	50.0%		

**Kansas Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	361	332	361	92.0%	100%
2012	419	376	419	89.7%	100%
Chg 05-12	16.1%	13.3%	16.1%		

**Kansas Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	35	26	35	74.3%	100%
2012	27	18	26	66.7%	96.3%
Chg 05-12	-22.9%	-30.8%	-25.7%		

**Kansas Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	6	5	6	83.3%	100%
2012	12	9	12	75.0%	100%
Chg 05-12	100.0%	80.0%	100.0%		

## VII. Kentucky and Natural Gas: Mixed State

Natural gas production in Kentucky has been an uneven story in recent years. While marketed production grew by 45.8 percent from 2005 to 2010, subsequently, from 2010 to 2012, production dropped by 21.6 percent. Over the entire period, from 2005 to 2012, natural gas marketed production in the state grew by 14.3 percent.

**Table 23: Kentucky Natural Gas Marketed Production**

2005:	92.8 billion cubic feet
2012:	106.1 billion cubic feet

A McClatchy report from May 21, 2014, explained the Kentucky situation this way:

*Kentucky poses challenges that don't exist for drilling natural gas from the deep underground Marcellus shale rock in West Virginia or the Utica shale in Ohio, said Terry Engelder, an oil and gas industry consultant and geoscientist at Pennsylvania State University. The high pressure of the Marcellus and Utica shales helps in drilling for natural gas because it drives the gas into the wells.*

*"Only the shallowest of the gas shale layers are found under the surface in Kentucky. These layers don't have the pressure found in either the Marcellus or Utica," Engelder said.*

*There are also concerns that Kentucky shales aren't as rich in the profitable natural-gas liquids of ethane, butane and propane that drillers are finding elsewhere.<sup>33</sup>*

### Impact on Jobs

Table 24 compares employment growth (again, all employment and business data from Census Bureau "County Business Patterns" unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors.

While overall employment fell between 2005 and 2012 in Kentucky, jobs also declined in three out of four oil and gas sectors for which we have data. However, jobs did grow among employer establishments from 2005 to 2012 in the oil and gas extraction sector – an increase of 41.8 percent.

**Table 24: Kentucky Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	1,514,199	1,481,323	-2.2%
Oil/Gas Extraction	668	947	41.8%
Drilling Oil and Gas Wells	450	331	-26.4%
Support for Oil and Gas Operations	802	493	-38.5%
Oil and Gas Pipeline and Related Structures Construction	1,175	936	-20.3%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	NA	NA

## Impact on Small Business

The number of businesses (in this case, establishments) declined in the nation and in Kentucky, including in each major energy sector examined here, as noted in Table 25.

Finally, it must be noted that the Kentucky energy sector is not all about big energy businesses. As noted in Table 25, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 86.1 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 88.1 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 88.5 percent of employer establishments in 2012 had less than 20 workers, and 98.8 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 39.1 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 25: Establishments – Kentucky Total and Energy Industries, 2005-2012**

**Kentucky Total Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	92,176	78,359	91,928	85.0%	99.7%
2012	89,795	76,258	89,555	84.9%	99.7%
KY 05-12	-2.6%	-2.7%	-2.6%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Kentucky Oil/Gas Extraction Employer Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	84	76	84	90.5%	100%
2012	79	68	79	86.1%	100%
Chg 05-12	-6.0%	-10.5%	-6.0%		

**Kentucky Drilling Oil and Gas Wells Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	58	49	58	84.5%	100%
2012	42	37	42	88.1%	100%
Chg 05-12	-27.6%	-24.5%	-27.6%		

**Kentucky Support for Oil and Gas Operations Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	64	55	64	85.9%	100%
2012	61	54	61	88.5%	100%
Chg 05-12	-4.7%	-1.8%	-4.7%		

**Kentucky Oil and Gas Pipeline and Related Structures Construction Establishments**

	Total	Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	26	17	26	65.4%	100%
2012	23	9	23	39.1%	100%
Chg 05-12	-11.5%	-47.1%	-11.5%		

**Kentucky Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	Total	Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	NA	NA	NA	NA	NA
2012	NA	NA	NA	NA	NA
Chg 05-12	NA	NA	NA		

## VIII. Louisiana: Growth State

The increase in natural gas production was sizeable in Louisiana, to say the least, from 2005 to 2011. But production declined in 2012 and 2013. Still, the state’s natural gas production, as highlighted in Table 26, expanded by 83.0 percent from 2005 to 2013.

**Table 26: Louisiana Natural Gas Marketed Production**

2005:	1,296.0 billion cubic feet
2013:	2,371.5 billion cubic feet

Why the recent decline? As reported by Platts.com in an April 23, 2014, report:

*With the brutal winter of 2013-2014 receding into the rearview mirror, some prominent industry observers have speculated that evidence of increased gas demand -- as well as higher wellhead prices -- would prompt a return of drilling rigs to the Louisiana portion of the Haynesville Shale.*

*But that doesn’t appear to be the case, as producers are taking a wait-and-see approach before committing significant resources to the once red-hot dry-gas play.*

*Drilling in the play ramped up quickly following its discovery by Chesapeake Energy, which drilled its first wells in 2006. But activity in the high-cost Haynesville fell off just as quickly as producers in recent years shifted their focus to higher-return, oilier and more liquids-rich plays such as the Eagle Ford Shale of South Texas.<sup>34</sup>*

### Impact on Jobs

Table 27 compares employment growth (again, all employment and business data from Census Bureau “County Business Patterns” unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors. The difference in the employment story between the energy sector and the overall economy is notable, even with the decline in the oil and gas extraction sector.

Overall employment increased between 2005 and 2012 in Louisiana, with jobs growing markedly in two of the three energy sectors for which we have complete data:

- by 11.3 percent in the drilling oil and gas wells sector;
- and by 40.8 percent in the support sector for oil and gas operations.

**Table 27: Louisiana Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	1,617,507	1,644,282	1.7%
Oil/Gas Extraction	10,280	9,058	-11.9%
Drilling Oil and Gas Wells	6,524	7,258	11.3%
Support for Oil and Gas Operations	26,069	36,705	40.8%
Oil and Gas Pipeline and Related Structures Construction	14,452	NA	NA
Oil and Gas Field Machinery and Equipment Manufacturing	NA	3,502	NA

## Impact on Small Businesses

At the same time, while the number of businesses (in this case, establishments) in the nation declined, in Louisiana, the number of establishments grew, and they expanded strongly in the state's energy sector. It is critical to note the role and growth of smaller businesses as well.

Table 28 makes clear that expanded production in the energy sector has been a boon for small and midsize enterprises in the state. Or, to look at it from a different angle, expanded energy production has been driven by small and midsize businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2012, including a 1.0 percent decline in firms with less than 20 workers, and a 0.9 percent fall in firms with less than 500 workers.

In Louisiana, total establishments increased by 1.2 percent, including a 0.6 percent increase among establishments with less than 20 workers, and a 1.3 percent rise among those with less than 500 workers.

Again, compare the U.S. decline to the growth in these energy industries in Louisiana:

- Among oil and gas extraction businesses, the number of employer establishments grew by 8.3 percent, including growth of 8.1 percent among establishments with less than 20 workers and 8.9 percent among establishments with less than 500 workers.
- Among oil and gas wells businesses, the number of employer establishments grew by 3.4 percent, including growth of 4.0 percent among establishments with less than 500 workers.
- Among support for oil and gas operations businesses, the number of employer establishments grew by 35.4 percent, including growth of 33.7 percent among establishments with less than 20 workers and 35.8 percent among establishments with less than 500 workers.
- Among oil and gas pipeline and related structures construction businesses, the number of employer establishments grew by 9.5 percent, including growth of 9.7 percent among establishments with less than 500 workers.
- Among field machinery and equipment manufacturing businesses, the number of employer establishments grew by 42.4 percent, including growth of 59.3 percent among establishments with less than 20 workers and 42.4 percent among establishments with less than 500 workers.

The growth in both jobs and small-midsize employer establishments in the energy sector has been noteworthy in recent years, again especially given the abysmal performance of the overall economy.

Finally, it must be noted that the Louisiana energy sector in fact is not all about huge enterprises. As noted in Table 28, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 77.4 percent of employer establishments in 2012 had less than 20 workers, and 99.5 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 68.6 percent of employer establishments in 2012 had less than 20 workers, and 99.5 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 71.1 percent of employer establishments in 2012 had less than 20 workers, and 98.8 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 47.0 percent of employer establishments in 2012 had less than 20 workers, and 98.3 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 57.2 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 28: Establishments – Louisiana Total and Energy Industries, 2005-2012**

**Louisiana Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	102,790	87,638	102,526	85.3%	99.7%
2012	104,059	88,147	103,822	84.7%	99.8%
LA 05-12	1.2%	0.6%	1.3%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	397	308	393	77.6%	99.0%
2012	430	333	428	77.4%	99.5%
Chg 05-12	8.3%	8.1%	8.9%		

**Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	179	127	177	70.9%	98.9%
2012	185	127	184	68.6%	99.5%
Chg 05-12	3.4%	0.0%	4.0%		

**Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	738	531	727	72.0%	98.5%
2012	999	710	987	71.1%	98.8%
Chg 05-12	35.4%	33.7%	35.8%		

**Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	105	58	103	55.2%	98.1%
2012	115	54	113	47.0%	98.3%
Chg 05-12	9.5%	-6.9%	9.7%		

**Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	59	27	59	45.8%	100%
2012	84	43	84	51.2%	100%
Chg 05-12	42.4%	59.3%	42.4%		



## IX. Michigan and Natural Gas: Declining State

Michigan’s natural gas production, as highlighted in Table 29, declined by 50.5 percent from 2005 to 2012.

**Table 29: Michigan Natural Gas Marketed Production**

2005:	261.2 billion cubic feet
2012:	129.3 billion cubic feet

### Impact on Jobs

Table 30 compares employment growth (again, all employment and business data from Census Bureau “County Business Patterns” unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors.

While overall employment fell between 2005 and 2012 in Michigan, jobs grew markedly in two energy sectors.

Michigan total employment *declined* by 8.7 percent from 2005 to 2012, but jobs *grew*:

- by 109.3 percent in the support sector for oil and gas operations;
- and by 188.5 percent in the oil and gas pipeline and related structures construction sector.

**Table 30: Michigan Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	3,796,876	3,468,089	-8.7%
Oil/Gas Extraction	1,030	896	-13.0%
Drilling Oil and Gas Wells	576	500	-13.2%
Support for Oil and Gas Operations	969	2,028	109.3%
Oil and Gas Pipeline and Related Structures Construction	634	1,829	188.5%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	NA	NA

## Impact on Small Business

At the same time, while the number of businesses (in this case, establishments) declined in the nation and in Michigan, the number of establishments grew strongly in two energy sectors. And it is critical to note the role and growth of smaller businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2010, including a 1.0 percent decline in establishments with less than 20 workers, and a 0.9 percent fall in establishments with less than 500 workers.

In Michigan, as noted in Table 31, total establishments declined by 8.5 percent, including a 8.3 percent fall among establishments with less than 20 workers, and a 8.5 percent decline among those with less than 500 workers.

But compare those declines to the growth in these energy industries in Michigan:

- Among support for oil and gas operations businesses, the number of employer establishments grew by 12.6 percent, including growth of 2.2 percent among establishments with less than 20 workers and 11.7 percent among establishments with less than 500 workers.
- Among oil and gas pipeline and related structures construction businesses, the number of employer establishments grew by 11.8 percent, including growth of 11.8 percent among establishments with less than 500 workers.

Finally, it must be noted that the Michigan energy sector is not all about big energy businesses. As noted in Table 31, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 85.7 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 78.6 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 80.2 percent of employer establishments in 2012 had less than 20 workers, and 99.1 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 68.4 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 100 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 31: Establishments – Michigan Total and Energy Industries, 2005-2012**

**Michigan Total Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	237,523	204,045	236,979	85.9%	99.8%
2012	217,440	187,048	216,868	86.0%	99.7%
MI 05-12	-8.5%	-8.3%	-8.5%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Michigan Oil/Gas Extraction Employer Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	101	89	101	88.1%	100%
2012	84	72	84	85.7%	100%
Chg 05-12	-16.8%	19.1%	-16.8%		

**Michigan Drilling Oil and Gas Wells Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	37	29	37	78.4%	100%
2012	28	22	28	78.6%	100%
Chg 05-12	-24.3%	-24.1%	-24.3%		

**Michigan Support for Oil and Gas Operations Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	103	91	103	88.3%	100%
2012	116	93	115	80.2%	99.1%
Chg 05-12	12.6%	2.2%	11.7%		

**Michigan Oil and Gas Pipeline and Related Structures Construction Establishments**

	Total	Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	34	26	34	-23.5%	100%
2012	38	26	38	68.4%	100%
Chg 05-12	11.8%	0.0%	11.8%		

**Michigan Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	Total	Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	3	2	3	66.7%	100%
2012	2	2	2	100%	100%
Chg 05-12	-33.3%	0.0%	-33.3%		

## X. New Mexico and Natural Gas: Declining State

Natural gas marketed production in New Mexico declined by 24.5 percent from 2005 to 2013. However, it also needs to be noted that crude oil production in the state increased notably from 2009 to 2013.

**Table 32: New Mexico Natural Gas Marketed Production**

2005:	1,645.2 billion cubic feet
2013:	1,241.6 billion cubic feet

### Impact on Jobs

Table 33 compares employment growth (again, all employment and business data from Census Bureau "County Business Patterns" unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors. The difference in the employment story between the energy sector and the overall economy is striking.

Overall employment increased between 2005 and 2012 in New Mexico, but jobs grew markedly in two key energy sectors:

- by 42.6 percent in the oil and gas extraction sector;
- and by 46.7 percent in the support sector for oil and gas operations.

**Table 33: New Mexico Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	595,249	602,715	1.3%
Oil/Gas Extraction	2,525	3,600	42.6%
Drilling Oil and Gas Wells	3,183	3,131	-1.6%
Support for Oil and Gas Operations	5,542	8,128	46.7%
Oil and Gas Pipeline and Related Structures Construction	1,749	1,641	-6.2%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	NA	NA

## Impact on Small Business

The number of businesses (in this case, establishments) declined in the nation and in New Mexico, with growth occurring in two energy sectors, as noted in Table 34:

- Among support for oil and gas operations businesses, the number of employer establishments grew by 42.9 percent, including growth of 37.1 percent among establishments with less than 20 workers and 42.6 percent among establishments with less than 500 workers.
- Among oil and gas field machinery and equipment manufacturing, the number of employer establishments grew by 75.0 percent, including growth of 66.7 percent among establishments with less than 20 workers and 75.0 percent among establishments with less than 500 workers.

Finally, it must be noted that the New Mexico energy sector is not all about big energy businesses. As noted in Table 34, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 75.0 percent of employer establishments in 2010 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 50.0 percent of employer establishments in 2010 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 74.8 percent of employer establishments in 2010 had less than 20 workers, and 99.8 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 38.7 percent of employer establishments in 2010 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 71.4 percent of employer establishments in 2010 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 34: Establishments – New Mexico Total and Energy Industries, 2005-2012**
**New Mexico Total Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	45,006	39,033	44,938	86.7%	99.8%
2012	43,883	37,955	43,769	86.5%	99.7%
NM 05-12	-2.5%	-2.8%	-2.6%		
US 05-12	-0.9%	-1.0%	-0.9%		

**New Mexico Oil/Gas Extraction Employer Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	182	144	182	79.1%	100%
2012	176	132	176	75.0%	100%
Chg 05-12	-3.3%	-8.3%	-3.3%		

**New Mexico Drilling Oil and Gas Wells Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	84	59	83	70.2%	98.8%
2012	72	36	72	50.0%	100%
Chg 05-12	-14.3%	-39.0%	-13.3%		

**New Mexico Support for Oil and Gas Operations Establishments**

	Total	By Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	294	229	294	77.9%	100%
2012	420	314	419	74.8%	99.8%
Chg 05-12	42.9%	37.1%	42.6%		

**New Mexico Oil and Gas Pipeline and Related Structures Construction Establishments**

	Total	Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	42	23	42	54.8%	100%
2012	31	12	31	38.7%	100%
Chg 05-12	-26.2%	-47.8%	-26.2%		

**New Mexico Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	Total	Number of Employees		As Percent of Total Establishments	
		Less 20	Less 500	Less 20	Less 500
2005	4	3	4	75.0%	100%
2012	7	5	7	71.4%	100%
Chg 05-12	75.0%	66.7%	75.0%		

## XI. North Dakota: Growth State

The big energy story in North Dakota in recent years has been the increase in oil production, pushing the state to ranking second among the states in oil output. At the same time, though, the increase in natural gas production has been sizeable as well. The state's natural gas production, as highlighted in Table 35, expanded by 240.6 percent from 2005 to 2012.

**Table 35: North Dakota Natural Gas Marketed Production**

2005:	52.557 billion cubic feet
2012:	179.004 billion cubic feet

### Impact on Jobs

Table 36 compares employment growth (again, all employment and business data from Census Bureau "County Business Patterns" unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors. The difference in the employment story between North Dakota, including its energy sector, and the overall U.S. economy is striking.

While overall employment increased between 2005 and 2012 in North Dakota, jobs grew even faster in the energy sector given the expansion in energy production.

While U.S. total employment *declined*, North Dakota employment *grew* overall (by 22.5 percent), including in each energy sector for which data was available, expanding:

- by 83.5 percent in the oil and gas extraction sector;
- by 874.4 percent in the drilling oil and gas wells sector;
- and by 900.6 percent in the support sector for oil and gas operations.

**Table 36: North Dakota Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	270,479	331,278	22.5%
Oil/Gas Extraction	1,130	2,074	83.5%
Drilling Oil and Gas Wells	554	5,398	874.4%
Support for Oil and Gas Operations	1,036	10,366	900.6%
Oil and Gas Pipeline and Related Structures Construction	NA	763	NA
Oil and Gas Field Machinery and Equipment Manufacturing	NA	NA	NA

## Impact on Small Businesses

At the same time, while the number of businesses (in this case, establishments) in the nation declined, in North Dakota, the number of establishments grew strongly, and they expanded most dramatically in the state's energy sector. It is critical to note the role and growth of smaller businesses as well.

Table 37 makes clear that expanded production in the energy sector has been a boon for small and midsize enterprises in the state. Or, to look at it from a different angle, expanded energy production has been driven by small and midsize businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2010, including a 1.0 percent decline in establishments with less than 20 workers, and a 0.9 percent fall in establishments with less than 500 workers.

In North Dakota, total establishments increased by 11.8 percent, including a 32.5 percent increase among establishments with less than 20 workers, and a 25.3 percent rise among those with less than 500 workers.

Again, compare the U.S. decline to the growth in these energy industries in North Dakota:

- Among oil and gas extraction businesses, the number of employer establishments grew by 96.9 percent, including growth of 92.0 percent among establishments with less than 20 workers and 100 percent among establishments with less than 500 workers.
- Among drilling oil and gas wells businesses, the number of employer establishments grew by 130.0 percent, including growth of 118.2 percent among establishments with less than 20 workers and 110.0 percent among establishments with less than 500 workers.
- Among support for oil and gas operations businesses, the number of employer establishments grew by 215.7 percent, including growth of 155.1 percent among establishments with less than 20 workers and 212.7 percent among establishments with less than 500 workers.
- Among oil and gas pipeline and related structures businesses, the number of employer establishments grew by 185.7 percent, including growth of 83.3 percent among establishments with less than 20 workers and 185.7 percent among establishments with less than 500 workers.
- Among oil and gas field machinery and equipment businesses, the number of employer establishments grew by 200 percent, including growth of 50.0 percent among establishments with less than 20 workers and 200 percent among establishments with less than 500 workers.

The growth in both jobs and small-midsize employer establishments in the energy sector has been noteworthy in recent years, especially given the abysmal performance of the overall economy.

Finally, it must be noted that the North Dakota energy sector in fact is not all about huge enterprises. As noted in Table 37, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 76.2 percent of employer establishments in 2012 had less than 20 workers, and 98.4 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 52.2 percent of employer establishments in 2012 had less than 20 workers, and 91.3 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 70.5 percent of employer establishments in 2012 had less than 20 workers, and 99.1 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 55.0 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 50.0 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.



**Table 37: Establishments – North Dakota Total and Energy Industries, 2005-2012**

**North Dakota Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	21,061	15,268	18,768	72.5%	89.1%
2012	23,551	20,232	23,518	85.9%	99.9%
ND 05-12	11.8%	32.5%	25.3%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	32	25	31	78.1%	96.9%
2012	63	48	62	76.2%	98.4%
Chg 05-12	96.9%	92.0%	100.0%		

**Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	20	11	20	55.0%	100%
2012	46	24	42	52.2%	91.3%
Chg 05-12	130.0%	118.2%	110.0%		

**Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	102	89	102	87.3%	100%
2012	322	227	319	70.5%	99.1%
Chg 05-12	215.7%	155.1%	212.7%		

**Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	7	6	7	85.7%	100%
2012	20	11	20	55.0%	100%
Chg 05-12	185.7%	83.3%	185.7%		

**Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	2	2	2	100%	100%
2012	6	3	6	50.0%	100%
Chg 05-12	200.0%	50.0%	200.0%		

## XII. Ohio: Growth State

**The opportunity for increased shale natural gas production in Ohio has leaped forward, according to the latest reports as this study was being written.**

For example, on July 3, 2014, the *Columbus Dispatch* reported:

*"New fracking wells spread rapidly throughout the Utica shale in eastern Ohio last year, increasing the state's natural-gas production to historic highs, state officials said yesterday."*

*Natural-gas production increased by 97 percent in 2013 from 2012 numbers, Ohio Department of Natural Resources Director James Zehringer said yesterday during a presentation at Stark State College.*

*And oil production increased by 62 percent during that same time.*

*Zehringer said fracking in the Utica shale formation that runs below much of eastern and southern Ohio was directly responsible for the increase. "The Utica play is the real deal," he said...*

*Drillers tapped 85 wells in the Utica shale in Ohio in 2012. In the first six months of 2014 alone, Natural Resources has approved about 350 permits for shale wells. Officials said they expect to approve another 350 by the end of 2014, and predict an additional 800 in 2015.<sup>35</sup>*

Also, a July 2, 2014, report at Ohio.com noted: "Oil production from shale grew by 470 percent from 2012 to 2013 and natural gas production from shale climbed by 680 percent in that time, state officials said on Wednesday at a State of the Play presentation at Stark State College in Jackson Township outside of Canton."<sup>36</sup>

It's worth noting that a December 2012 IHS study projected that jobs tied to unconventional oil and gas production in Ohio could rise from 38,830 in 2012 to 143,595 in 2020 and 266,624 in 2035.<sup>37</sup>

As noted in Table 38, natural gas marketed production in Ohio grew by only 1.1 percent. However, growth in 2012 versus 2011 was better than 7 percent, and if we take the natural gas increases as reported above, then 2013 production could be double the 2005 level. Therefore, with the lag in jobs and business data, the following analysis comes up far short of where the state of Ohio actually is today regarding employment and business growth thanks to increased natural gas and oil production.

**Table 38: Ohio Natural Gas Marketed Production**

2005:	83.523 billion cubic feet
2012:	84.482 billion cubic feet

### Impact on Jobs

Table 39 compares employment growth (again, all employment and business data from Census Bureau "County Business Patterns" unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors. Unfortunately, given the limited activity on the energy front, Ohio has suffered along with the rest of the nation during these tough economic times. However, employment growth between 2005 and 2012 was strong in two energy sectors, expanding by:

While U.S. total employment *declined* from 2005 to 2010, it fell even more in Ohio. And the jobs story in the energy sector was mixed, with employment expanding:

- by 39.6 percent in the support sector for oil and gas operations;
- and by 37.6 percent in the oil and gas pipeline and related structures construction.

**Table 39: Ohio Employment Growth Among Employer Establishments, 2005-2012**

<b>Sector</b>	<b>2005</b>	<b>2012</b>	<b>Percent Change</b>
Total	4,762,618	4,548,143	-4.5%
Oil/Gas Extraction	1,355	1,235	-8.9%
Drilling Oil and Gas Wells	515	719	39.6%
Support for Oil and Gas Operations	1,206	968	-19.7%
Oil and Gas Pipeline and Related Structures Construction	2,281	3,139	37.6%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	391	NA

### Impact on Small Businesses

And while the number of businesses (in this case, establishments) in the nation declined, in Ohio, the decline was even larger.

As noted in Table 40, for all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2010, including a 1.0 percent decline in firms with less than 20 workers, and a 0.9 percent fall in firms with less than 500 workers.

In Ohio, total establishments decreased by 7.4 percent, including a 7.8 percent drop among establishments with less than 20 workers, and a 7.4 percent fall off among those with less than 500 workers.

But Ohio's numbers in the energy sector regarding establishment growth have been very mixed, with growth occurring in two sectors:

- Among support for oil and gas operations businesses, the number of employer establishments grew by 7.2 percent, including growth of 7.1 percent among establishments with less than 20 workers and 7.2 percent among establishments with less than 500 workers.
- Among oil and gas pipeline and related structures construction businesses, the number of employer establishments grew by 28.8 percent, including growth of 28.9 percent among establishments with less than 20 workers and 29.3 percent among those with less than 500.

As noted in Table 40, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 95.5 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 86.6 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas operations businesses, 91.9 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 64.5 percent of employer establishments in 2012 had less than 20 workers, and 98.7 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 44.4 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 40: Establishments – Ohio Total and Energy Industries, 2005-2012**
**Ohio Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	270,968	227,995	270,216	84.1%	99.7%
2012	250,842	210,217	250,132	83.8%	99.7%
OH 05-12	-7.4%	-7.8%	-7.4%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	209	195	209	93.3%	100%
2012	198	189	198	95.5%	100%
Chg 05-12	-5.3	-3.1	-5.3		

**Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	70	60	70	85.7%	100%
2012	67	58	67	86.6%	100%
Chg 05-12	-4.3%	-3.3	-4.3		

**Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	138	127	138	92.0%	100%
2012	148	136	148	91.9%	100%
Chg 05-12	7.2%	7.1%	7.2%		

**Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	59	38	58	64.4%	98.3%
2012	76	49	75	64.5%	98.7%
Chg 05-12	28.8%	28.9%	29.3%		

**Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	9	8	9	88.9%	100%
2012	9	4	9	44.4%	100%
Chg 05-12	0.0%	-50.0%	0/0%		

## XIII. Oklahoma: Growth State

Natural gas production in Oklahoma, as highlighted in Table 41, expanded by 30.8 percent from 2005 to 2013. For good measure, crude oil production in the state increased markedly from 2009 to 2013.

**Table 41: Oklahoma Natural Gas Marketed Production**

2005:	1,639.3 billion cubic feet
2013:	2,144.0 billion cubic feet

### Impact on Jobs

Table 42 compares employment growth (again, all employment and business data from Census Bureau "County Business Patterns" unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors. The difference in the employment story between Oklahoma, including its energy sector, and the overall U.S. economy is striking.

While overall employment increased between 2005 and 2012 in Oklahoma, jobs grew robustly in the energy sector given the expansion in energy production.

While U.S. total employment *declined*, Oklahoma employment *grew* overall, including in the energy sector, expanding:

- by 82.7 percent in the oil and gas extraction sector;
- by 71.6 percent in the drilling oil and gas wells sector;
- by 93.4 percent in the support sector for oil and gas operations;
- by 72.1 percent in the oil and gas pipeline and related structures construction sector;
- and by 48.7 percent in the oil and gas field machinery and equipment manufacturing sector.

Oklahoma employers overall added 84,898 jobs over this period, with employers in the energy industries included here adding 28,609.

**Table 42: Oklahoma Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	1,220,285	1,305,183	7.0%
Oil/Gas Extraction	9,878	18,044	82.7%
Drilling Oil and Gas Wells	6,460	11,084	71.6%
Support for Oil and Gas Operations	12,705	24,568	93.4%
Oil and Gas Pipeline and Related Structures Construction	2,956	5,087	72.1%
Oil and Gas Field Machinery and Equipment Manufacturing	3,746	5,571	48.7%

## Impact on Small Businesses

At the same time, while the number of businesses (in this case, establishments) in the nation declined, in Oklahoma, the number of establishments grew, and they expanded strongly in the state's energy sector. It is critical to note the role and growth of smaller businesses as well.

Table 43 makes clear that expanded production in the energy sector has been a boon for small and midsize enterprises in the state. Or, to look at it from a different angle, expanded energy production has been driven by small and midsize businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2012, including a 1.0 percent decline in firms with less than 20 workers, and a 0.9 percent fall in firms with less than 500 workers.

In Oklahoma, total establishments increased by 2.7 percent, including a 1.8 percent increase among establishments with less than 20 workers, and a 2.7 percent rise among those with less than 500 workers.

Again, compare the U.S. decline to the growth in these energy industries in Oklahoma:

- Among oil and gas extraction businesses, the number of employer establishments grew by 15.8 percent, including growth of 12.8 percent among establishments with less than 20 workers and 15.7 percent among establishments with less than 500 workers.
- Among oil and gas wells businesses, the number of employer establishments grew by 1.2 percent, including growth of 7.7 percent among establishments with less than 500 workers.
- Among support for oil and gas operations businesses, the number of employer establishments grew by 64.1 percent, including growth of 56.8 percent among establishments with less than 20 workers and 64.3 percent among establishments with less than 500 workers.

- Among oil and gas pipeline and related structures construction businesses, the number of employer establishments grew by 24.5 percent, including growth of 10.6 percent among those with less than 20 workers and 22.4 percent among establishments with less than 500 workers.
- Among oil and gas field machinery and equipment manufacturing businesses, the number of employer establishments grew by 25.4 percent, including growth of 16.7 percent among those with less than 20 workers and 25.8 percent among those with less than 500 workers.

The growth in both jobs and small-midsize employer establishments in Oklahoma's energy sector has been strong in recent years, again especially given the abysmal performance of the overall U.S. economy.

Finally, it must be noted that the Oklahoma energy sector in fact is not the domain of huge enterprises. As noted in Table 43, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 89.6 percent of employer establishments in 2012 had less than 20 workers, and 99.8 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 72.3 percent of employer establishments in 2012 had less than 20 workers, and 98.0 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 84.1 percent of employer establishments in 2012 had less than 20 workers, and 99.9 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 59.8 percent of employer establishments in 2010 had less than 20 workers, and 98.4 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 50.0 percent of employer establishments in 2010 had less than 20 workers, and 98.8 percent had fewer than 500 employees.

**Table 43: Establishments – Oklahoma Total and Energy Industries, 2005-2012**

**Oklahoma Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	88,548	76,986	88,369	86.9%	99.8%
2012	90,954	78,368	90,780	86.2%	99.8%
OK 05-10	2.7%	1.8%	2.7%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	1,076	989	1,075	91.9%	99.9%
2012	1,246	1,116	1,244	89.6%	99.8%
Chg 05-12	15.8%	12.8%	15.7%		

**Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	235	195	233	83.0%	99.1%
2012	256	185	251	72.3%	98.0%
Chg 05-12	1.2%	-5.1%	7.7%		

**Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	914	804	912	88.0%	99.8%
2012	1,500	1,261	1,498	84.1%	99.9%
Chg 05-12	64.1%	56.8%	64.3%		

**Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	98	66	98	67.3%	100%
2012	122	73	120	59.8%	98.4%
Chg 05-12	24.5%	10.6%	22.4%		

**Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	67	36	66	53.7%	98.5%
2012	84	42	83	50.0%	98.8%
Chg 05-12	25.4%	16.7%	25.8%		

## XIV. Pennsylvania: Growth State

The increase in natural gas production has been dramatic in Pennsylvania via the Marcellus Shale area. The state's natural gas production, as highlighted in Table 44, expanded by 1,239.3 percent from 2005 to 2012. Over the same period, by the way, crude oil production roughly doubled.

**Table 44: Pennsylvania Natural Gas Marketed Production**

2005:	168.5 billion cubic feet
2012:	2,256.7 billion cubic feet

### Impact on Jobs

Table 45 compares employment growth (again, all employment and business data from Census Bureau "County Business Patterns" unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors. The difference in the employment story between the energy sector and the overall economy is striking.

While overall employment in the state increased between 2005 and 2012, jobs grew dramatically in the energy sector given the expansion in energy production.

And while U.S. total employment *declined* from 2005 to 2012, Pennsylvania jobs *grew*:

- by 169.0 percent in the oil and gas extraction sector;
- by 504.5 percent in the drilling oil and gas wells sector;
- by 512.3 percent in the support sector for oil and gas operations;
- by 212.3 percent in the oil and gas pipeline and related structures construction sector;
- and by 37.2 percent in the oil and gas field machinery and equipment manufacturing sector.

While Pennsylvania employers overall added 86,566 jobs over this period, employers in the five energy industries included here added 18,033 jobs (that is, direct jobs in each sector without factoring in broader indirect jobs tied to expanded production and reduced prices).

**Table 45: Pennsylvania Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	5,082,630	5,169,196	1.7%
Oil/Gas Extraction	1,809	4,867	169.0%
Drilling Oil and Gas Wells	846	5,114	504.5%
Support for Oil and Gas Operations	1,640	10,042	512.3%
Oil and Gas Pipeline and Related Structures Construction	1,025	3,201	212.3%
Oil and Gas Field Machinery and Equipment Manufacturing	347	476	37.2%



## Impact on Small Businesses

At the same time, while the number of businesses (in this case, establishments) declined in the nation and in Pennsylvania, the number of establishments grew strongly among Pennsylvania's energy sector. And it is critical to note the role and growth of smaller businesses.

Table 46 makes clear that expanded production in the energy sector has been a boon for small and midsize enterprises in the state. Or, to look at it from a different angle, expanded energy production has been driven by small and midsize businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2012, including a 1.0 percent decline in firms with less than 20 workers, and a 0.9 percent fall in firms with less than 500 workers.

In Pennsylvania, total establishments declined by 2.1 percent, including a 2.8 percent fall among establishments with less than 20 workers, and a 2.1 percent decline among those with less than 500 workers.

Compare those declines to the growth in these energy industries in Pennsylvania:

- Among oil and gas extraction businesses, the number of employer establishments grew by 37.3 percent, including growth of 29.0 percent among establishments with less than 20 workers and 37.3 percent among establishments with less than 500 workers.
- Among drilling oil and gas wells businesses, the number of employer establishments grew by 100 percent, including growth of 73.0 percent among establishments with less than 20 workers and 95.8 percent among establishments with less than 500 workers.
- Among supporting oil and gas operations businesses, the number of employer establishments grew by 237.7 percent, including growth of 173.3 percent among those with less than 20 workers and 236.4 percent among establishments with less than 500 workers.

- Among oil and gas pipeline and related structures construction businesses, the number of employer establishments grew by 42.6 percent, including growth of 13.0 percent among establishments with less than 20 workers, and 42.6 percent among establishments with less than 500 workers.
- Among oil and gas field machinery and equipment manufacturing businesses, the number of employer establishments grew by 9.1 percent, including growth of 40.0 percent among establishments with less than 20 workers, and 9.1 percent among establishments with less than 500 workers.

The growth in both jobs and small-midsize employer establishments in the energy sector has been striking in recent years, especially given the abysmal performance of the overall economy.

Finally, it must be noted that the Pennsylvania energy sector is not all about huge enterprises. As noted in Table 46, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 77.7 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 66.7 percent of employer establishments in 2012 had less than 20 workers, and 97.9 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 63.1 percent of employer establishments in 2012 had less than 20 workers, and 99.6 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 67.5 percent of employer establishments in 2010 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing establishments, 58.3 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 46: Establishments – Pennsylvania Total and Energy Industries, 2005-2012**

**Pennsylvania Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	303,333	258,823	302,449	85.3%	99.7%
2012	296,872	251,506	296,016	84.7%	99.7%
PA 05-10	-2.1%	-2.8%	-2.1%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	150	124	150	82.7%	100%
2012	206	160	206	77.7%	100%
Chg 05-12	37.3%	29.0%	37.3%		

**Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	48	37	48	77.1%	100%
2012	96	64	94	66.7%	97.9%
Chg 05-12	100.0%	73.0%	95.8%		

**Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	77	60	77	77.9%	100%
2012	260	164	259	63.1%	99.6%
Chg 05-12	237.7%	173.3%	236.4%		

**Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	54	46	54	85.2%	100%
2012	77	52	77	67.5%	100%
Chg 05-12	42.6%	13.0%	42.6%		

**Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	11	5	11	45.5%	100%
2012	12	7	12	58.3%	100%
Chg 05-12	9.1%	40.0%	9.1%		

## XV. Texas: Growth State

The increase in natural gas production has been considerable in Texas. The state's natural gas production, as highlighted in Table 47, expanded by 39.8 percent from 2005 to 2013. In addition, crude oil production increased dramatically from 2009 to 2013.

**Table 47: Texas Natural Gas Marketed Production**

2005:	5,276.4 billion cubic feet
2013:	7,376.2 billion cubic feet

### Impact on Jobs

Table 48 compares employment growth (all employment and business data from Census Bureau "County Business Patterns" unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors.

The difference in the employment story in Texas versus the U.S. at large is breathtaking, including the growth in the Texas energy sector.

While Texas total employment increased by 12.6 percent from 2005 to 2012, jobs grew:

- by 45.0 percent in the oil and gas extraction sector;

- by 48.1 percent in the drilling oil and gas wells sector;
- by 119.3 percent in the support sector for oil and gas operations;
- by 82.2 percent in the oil and gas pipeline and related structures construction sector;
- and by 68.5 percent in the oil and gas field machinery and equipment manufacturing sector.

Texas employers overall added 1,045,727 jobs over this period, including employers in the energy industries included here adding 131,867 jobs (that is, direct jobs in each sector without factoring in broader indirect jobs tied to expanded production and reduced prices).

**Table 48: Texas Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	8,305,102	9,350,829	12.6%
Oil/Gas Extraction	34,124	49,496	45.0%
Drilling Oil and Gas Wells	31,310	46,367	48.1%
Support for Oil and Gas Operations	53,064	116,362	119.3%
Oil and Gas Pipeline and Related Structures Construction	29,299	53,371	82.2%
Oil and Gas Field Machinery and Equipment Manufacturing	20,544	34,612	68.5%

## Impact on Small Businesses

At the same time, while the number of businesses (in this case, establishments) declined in the nation, the number of establishments grew strongly in Texas, including in the energy sector. And it is critical to note the role and growth of smaller businesses.

Table 49 makes clear that expanded production in the energy sector has been a boon for small and midsize enterprises in the state. Or, to look at it from a different angle, expanded energy production has been driven by small and midsize businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2012, including a 1.0 percent decline in firms with less than 20 workers, and a 0.9 percent fall in firms with less than 500 workers.

In Texas, total establishments increased by 8.1 percent, including a 7.1 percent increase among establishments with less than 20 workers, and a 8.0 percent increase among those with less than 500 workers. The growth in energy industries in Texas were:

- Among oil and gas extraction businesses, the number of employer establishments grew by 11.4 percent, including growth of 7.8 percent among establishments with less than 20 workers and 10.6 percent among establishments with less than 500 workers.
- Among drilling oil and gas wells businesses, the number of employer establishments grew by 38.3 percent, including growth of 23.8 percent among establishments with less than 20 workers and 39.2 percent among establishments with less than 500 workers.
- Among supporting oil and gas operations businesses, the number of employer establishments grew by 60.2 percent, including growth of 44.4 percent among establishments with less than 20 workers and 60.2 percent among establishments with less than 500 workers.

- Among oil and gas pipeline and related structures construction businesses, the number of employer establishments grew by 49.9 percent, including growth of 42.6 percent among establishments with less than 20 workers and 49.6 percent among establishments with less than 500 workers.
- Among oil and gas field machinery and equipment manufacturing businesses, the number of employer establishments grew by 21.2 percent, including growth of 9.3 percent among establishments with less than 20 workers and 21.5 percent among those with less than 500.

The growth in both jobs and small-midsize employer establishments in the energy sector has been striking in recent years, especially given the abysmal performance of the overall economy.

Finally, it must be noted that the Texas energy sector in fact is not all about so-called “Big Oil.” As noted in Table 49, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 87.7 percent of employer establishments in 2012 had less than 20 workers, and 99.0 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 68.5 percent of employer establishments in 2012 had less than 20 workers, and 97.9 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 73.2 percent of employer establishments in 2012 had less than 20 workers, and 99.5 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 51.4 percent of employer establishments in 2010 had less than 20 workers, and 96.5 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing establishments, 47.6 percent of employer establishments in 2010 had less than 20 workers, and 97.0 percent had fewer than 500 employees.

**Table 49: Establishments – Texas Total and Energy Industries, 2005-2012**

**Texas Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	497,758	423,838	496,364	85.1%	99.7%
2012	537,839	453,971	536,258	84.4%	99.7%
TX 05-12	8.1%	7.1%	8.0%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	2,958	2,681	2,952	90.6%	99.8%
2012	3,296	2,890	3,264	87.7%	99.0%
Chg 05-12	11.4%	7.8%	10.6%		

**Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	587	449	571	76.5%	97.3%
2012	812	556	795	68.5%	97.9%
Chg 05-12	38.3%	23.8%	39.2%		

**Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	2,377	1,930	2,365	81.2%	99.5%
2012	3,809	2,787	3,789	73.2%	99.5%
Chg 05-12	60.2%	44.4%	60.2%		

**Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	365	197	353	54.0%	96.7%
2012	547	281	528	51.4%	96.5%
Chg 05-12	49.9%	42.6%	49.6%		

**Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	307	162	297	52.8%	96.7%
2012	372	177	361	47.6%	97.0%
Chg 05-12	21.2%	9.3%	21.5%		

## XVI. Utah: Growth State

The increase in natural gas production has been sizeable in Utah. The state's natural gas production, as highlighted in Table 50, expanded by 62.8 percent from 2005 to 2012. In addition, crude oil production in the state has grown notably since 2003.

**Table 50: Utah Natural Gas Marketed Production**

2005:	301.2 billion cubic feet
2012:	490.4 billion cubic feet

### Impact on Jobs

Table 51 compares employment growth (again, all employment and business data from Census Bureau "County Business Patterns" unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors.

The difference in the employment story in Utah versus the U.S. at large is striking, including the growth in the Utah energy sector.

While Utah total employment increased by 9.9 percent from 2005 to 2012, jobs grew:

- by 68.7 percent in the oil and gas extraction sector;
- by 34.6 percent in the drilling oil and gas wells sector;
- by 122.4 percent in the support sector for oil and gas operations;
- and by 123.4 percent in the oil and gas pipeline and related structures construction sector.

**Table 51: Utah Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	974,686	1,070,986	9.9%
Oil/Gas Extraction	1,027	1,733	68.7%
Drilling Oil and Gas Wells	610	821	34.6%
Support for Oil and Gas Operations	1,582	3,519	122.4%
Oil and Gas Pipeline and Related Structures Construction	547	1,222	123.4%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	96	NA

## Impact on Small Businesses

At the same time, while the number of businesses (in this case, establishments) declined in the nation, the number of establishments grew strongly in Utah, including in the energy sector. And it is critical to note the role and growth of smaller businesses.

Table 52 makes clear that expanded production in the energy sector has been a boon for small and midsize enterprises in the state. Or, to look at it from a different angle, expanded energy production has been driven by small and midsize businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2010, including a 1.0 percent decline in firms with less than 20 workers, and a 0.9 percent fall in firms with less than 500 workers.

In Utah, though, total establishments increased by 7.5 percent, including a 7.6 percent rise among establishments with less than 20 workers, and a 7.5 percent increase among those with less than 500 workers. The growth in energy industries in Utah were:

- Among oil and gas extraction businesses, the number of employer establishments grew by 10.7 percent, including growth of 17.5 percent among establishments with less than 20 workers and 10.7 percent among establishments with less than 500 workers.
- Among drilling oil and gas wells businesses, the number of employer establishments grew by 56.8 percent, including growth of 42.4 percent among establishments with less than 20 workers and 56.8 percent among establishments with less than 500 workers.
- Among supporting oil and gas operations businesses, the number of employer establishments grew by 53.5 percent, including growth of 47.1 percent among establishments with less than 20 workers and 53.5 percent among establishments with less than 500 workers.
- Among oil and gas pipeline and related structures construction businesses, the number of employer establishments grew by 16.7 percent, including growth of 16.7 percent among establishments with less than 500 workers.
- Among oil and gas field machinery and equipment manufacturing businesses, the number of employer establishments grew by 100 percent, including growth of 33.3 percent among establishments with less than 20 workers, and by 100 percent among those with less than 500 workers.

The growth in both jobs and small-midsize employer establishments in the energy sector has been striking in recent years, especially given the abysmal performance of the overall economy.

Finally, it must be noted that the Utah energy sector in fact is not all about large companies. As noted in Table 52, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 75.8 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 81.0 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 86.2 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 60.7 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing establishments, 66.7 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 52: Establishments – Utah Total and Energy Industries, 2005-2012**

**Utah Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	65,549	57,040	65,399	87.0%	99.8%
2012	70,454	61,351	70,272	87.1%	99.7%
UT 05-12	7.5%	7.6%	7.5%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	56	40	56	71.4%	100%
2012	62	47	62	75.8%	100%
Chg 05-12	10.7%	17.5%	10.7%		

**Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	37	33	37	89.2%	100%
2012	58	47	58	81.0%	100%
Chg 05-12	56.8%	42.4%	56.8%		

**Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	170	153	170	90.0%	100%
2012	261	225	261	86.2%	100%
Chg 05-12	53.5%	47.1%	53.5%		

**Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	24	18	24	75.0%	100%
2012	28	17	28	60.7%	100%
Chg 05-12	16.7%	-5.6%	16.7%		

**Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	3	3	3	100%	100%
2012	6	4	6	66.7%	100%
Chg 05-12	100.0%	33.3%	100.0%		



## XVII. Virginia and Natural Gas: Growth State

Virginia’s natural gas production, as highlighted in Table 53, expanded by 65.2 percent from 2005 to 2012.

**Table 53: Virginia Natural Gas Marketed Production**

2005:	88.6 billion cubic feet
2012:	146.4 billion cubic feet

### Impact on Jobs

Table 54 compares employment growth (again, all employment and business data from Census Bureau “County Business Patterns” unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors.

While overall employment grew by 1.0 percent between 2005 and 2012 in Virginia, jobs grew at a quicker pace in the two energy sectors for which we have complete data:

- by 2.4 percent in the support sector for oil and gas operations;
- and by 102.4 percent in the oil and gas pipeline and related structures construction sector.

**Table 54: Virginia Employment Growth Among Employer Establishments, 2005-2012**

<b>Sector</b>	<b>2005</b>	<b>2012</b>	<b>Percent Change</b>
Total	3,060,127	3,089,241	1.0%
Oil/Gas Extraction	205	NA	NA
Drilling Oil and Gas Wells	293	300	2.4%
Support for Oil and Gas Operations	NA	723	NA
Oil and Gas Pipeline and Related Structures Construction	780	1,579	102.4%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	NA	NA

## Impact on Small Business

The number of businesses (in this case, establishments) declined in the nation and in Virginia between 2005 and 2012, including in a couple of energy sectors, with no growth in two others and growth in one sector.

- Among supporting oil and gas operations businesses, the number of employer establishments grew by 80 percent, including growth of 80 percent among establishments with less than 20 workers and 80 percent among establishments with less than 500 workers.

It must be noted that the Virginia energy sector is not all about big energy businesses. As noted in Table 6, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 77.8 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 64.3 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 66.7 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 44.4 percent of employer establishments in 2012 had less than 20 workers, and 96.3 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing businesses, 50.0 percent of establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 workers.

**Table 55: Establishments – Virginia Total and Energy Industries, 2005-2012**

**Virginia Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	193,067	164,708	192,557	85.3%	99.7%
2012	192,730	164,112	192,250	85.2%	99.8%
VA 05-12	-0.2%	-0.4%	-0.2%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Virginia Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	19	16	19	84.2%	100%
2012	18	14	18	77.8%	100%
Chg 05-12	-5.3%	-12.5%	-5.3%		

**Virginia Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	18	13	18	72.2%	100%
2012	14	9	14	64.3%	100%
Chg 05-12	-22.2%	-30.8%	-22.2%		

**Virginia Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	15	10	15	66.7%	100%
2012	27	18	27	66.7%	100%
Chg 05-12	80.0%	80.0%	80.0%		

**Virginia Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	27	18	27	66.7%	100%
2012	27	12	26	44.4%	96.3%
Chg 05-12	0.0%	-33.3%	-3.7%		

**Virginia Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>Number of Employees</b>		<b>As Percent of Total Establishments</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	2	2	2	100%	100%
2012	2	1	2	50.0%	100%
Chg 05-12	0.0%	-50.0%	0.0%		

## XVIII. West Virginia: Growth State

The increase in natural gas production has been sizeable in West Virginia. The state's natural gas production, as highlighted in Table 56, expanded by 144.2 percent from 2005 to 2012. Also, crude oil production spiked higher in 2013.

**Table 56: West Virginia Natural Gas Marketed Production**

2005:	221.1 billion cubic feet
2012:	539.9 billion cubic feet

### Impact on Jobs

Table 57 compares employment growth (all employment and business data from Census Bureau "County Business Patterns" unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors. The key point in the employment story in West Virginia has to do with the energy sector.

While West Virginia total employment increased by 2.5 percent from 2005 to 2012, jobs grew at much faster rates in key energy sectors:

- by 59.6 percent in the oil and gas extraction sector;

- by 44.2 percent in the drilling oil and gas wells sector;
- by 310.1 percent in the support sector for oil and gas operations;
- and by 76.6 percent in the oil and gas pipeline and related structures construction sector.

West Virginia employers overall added 14,084 jobs over this period, yet employers in the energy industries included here (three for which there are data) added 5,731 jobs (that is, direct jobs in each sector without factoring in broader indirect jobs tied to expanded production and reduced prices).

**Table 57: West Virginia Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	565,499	579,583	2.5%
Oil/Gas Extraction	1,806	2,883	59.6%
Drilling Oil and Gas Wells	929	1,340	44.2%
Support for Oil and Gas Operations	1,154	4,732	310.1%
Oil and Gas Pipeline and Related Structures Construction	868	1,533	76.6%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	NA	NA

## Impact on Small Businesses

At the same time, while the number of businesses (in this case, establishments) declined in the nation and in West Virginia overall, the number of establishments grew strongly in West Virginia's energy sector. And it is critical to note the role and growth of smaller businesses.

Table 58 makes clear that expanded production in the energy sector has been a boon for small and midsize enterprises in the state. Or, to look at it from a different angle, expanded energy production has been driven by small and midsize businesses.

For all of the U.S., total employer establishments declined by 1.0 percent from 2005 to 2012, including a 0.9 percent decline in firms with less than 20 workers, and a 0.9 percent fall in firms with less than 500 workers.

In West Virginia, total establishments declined by 6.9 percent, including a 8.2 percent fall among establishments with less than 20 workers, and a 7.0 percent decline among those with less than 500 workers. However, the growth in energy industries in West Virginia were:

- Among oil and gas extraction businesses, the number of employer establishments grew by 0.5 percent.
- Among drilling oil and gas wells businesses, the number of employer establishments grew by 5.0 percent, including growth of 3.8 percent among establishments with less than 20 workers and 5.0 percent among establishments with less than 500 workers.
- Among supporting oil and gas operations businesses, the number of employer establishments grew by 73.6 percent, including growth of 52.1 percent among establishments with less than 20 workers and 72.4 percent among establishments with less than 500 workers.

- Among oil and gas pipeline and related structures construction businesses, the number of employer establishments grew by 28.6 percent, including growth of 26.1 percent among establishments with less than 20 workers, and 28.6 percent among establishments with less than 500 workers.

The growth in both jobs and small-midsize employer establishments in the energy sector has been striking in recent years, especially given the abysmal performance of the overall economy.

Finally, it must be noted that the West Virginia energy sector in fact is not all about huge enterprises. As noted in Table 58, each energy sector looked at is overwhelmingly populated by small and midsize establishments.

- Among oil and gas extraction businesses, 86.8 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 64.3 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 73.5 percent of employer establishments in 2010 had less than 20 workers, and 99.3 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 64.4 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing establishments, 50 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.

**Table 58: Establishments – West Virginia Total and Energy Industries, 2005-2012**

**West Virginia Total Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	40,735	35,419	40,656	86.9%	99.8%
2012	37,906	32,524	37,824	85.8%	99.8%
WV 05-12	-6.9%	-8.2%	-7.0%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Oil/Gas Extraction Employer Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	188	170	188	90.4%	100%
2012	189	164	189	86.8%	100%
Chg 05-12	0.5%	-3.5%	0.5%		

**Drilling Oil and Gas Wells Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	40	26	40	65.0%	100%
2012	42	27	42	64.3%	100%
Chg 05-12	5.0%	3.8%	5.0%		

**Support for Oil and Gas Operations Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	87	73	87	83.9%	100%
2012	151	111	150	73.5%	99.3%
Chg 05-12	73.6%	52.1%	72.4%		

**Oil and Gas Pipeline and Related Structures Construction Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	35	23	35	65.7%	100%
2012	45	29	45	64.4%	100%
Chg 05-12	28.6%	26.1%	28.6%		

**Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	<b>Total</b>	<b>By Number of Employees</b>		<b>As Percent of Total Firms</b>	
		<b>Less 20</b>	<b>Less 500</b>	<b>Less 20</b>	<b>Less 500</b>
2005	4	2	4	50.0%	100%
2012	2	1	2	50.0%	100%
Chg 05-12	-50.0%	-50.0%	-50.0%		

## XIX. Wyoming: Growth State

Wyoming’s natural gas production, as highlighted in Table 59, expanded by 15.2 percent from 2005 to 2013. That includes a huge increase from 2005 to 2009, and a subsequent decline. Also, Wyoming crude oil production has increased since 2009, after a long decline starting in the mid-1980s.

The decline since 2009 was explained in February 2014 report from the Wyoming State Geological Survey:

“Natural gas production in Wyoming, however, has steadily declined since 2009. This decrease is a result of a decline in prices, the depletion of existing fields, and because several large proposed projects on federal lands are working their

way through the federal regulatory review process. Two-thirds of Wyoming’s natural gas is produced on federal lands through industry lease agreement, primarily from fields in southwest and south-central Wyoming. Production can be delayed by the amount of time it takes for regulatory and environmental reviews.”<sup>38</sup>

**Table 59: Wyoming Natural Gas Marketed Production**

2005:	1,639.3 billion cubic feet
2013:	1,888.2 billion cubic feet

### Impact on Jobs

Table 60 compares employment growth (again, all employment and business data from Census Bureau “County Business Patterns” unless otherwise noted) among employer establishments in the overall state, and in various energy industry sectors.

Employment growth in Wyoming was positive over the period of 2005 to 2012, compared to a decline nationally, with Wyoming’s energy sector showing particularly solid expansion.

While Wyoming total employment increased by 11.6 percent from 2005 to 2012, jobs grew

- by 46.1 percent in the oil and gas extraction sector;
- by 48.1 percent in the drilling oil and gas wells sector;
- by 45.1 percent in the support sector for oil and gas operations;
- and by 268.4 percent in the oil and gas pipeline and related structures construction sector.

**Table 60: Wyoming Employment Growth Among Employer Establishments, 2005-2012**

Sector	2005	2012	Percent Change
Total	191,934	214,241	11.6%
Oil/Gas Extraction	2,663	3,891	46.1%
Drilling Oil and Gas Wells	3,041	4,504	48.1%
Support for Oil and Gas Operations	7,342	10,652	45.1%
Oil and Gas Pipeline and Related Structures Construction	892	3,286	268.4%
Oil and Gas Field Machinery and Equipment Manufacturing	NA	650	NA

## Impact on Small Businesses

At the same time, while the number of businesses (in this case, establishments) declined in the nation, the number of establishments grew in Wyoming, including in the energy sector. And it is critical to note the role and growth of smaller businesses.

Table 61 makes clear that expanded production in the energy sector has been a boon for small and midsize enterprises in the state. Or, to look at it from a different angle, expanded energy production has been driven by small and midsize businesses.

For all of the U.S., total employer establishments declined by 0.9 percent from 2005 to 2012, including a 1.4 percent decline in firms with less than 20 workers, and a 0.9 percent fall in firms with less than 500 workers.

In Wyoming, total establishments increased by 4.6 percent, including a 4.4 percent rise among establishments with less than 20 workers, and a 4.6 percent increase among those with less than 500 workers.

The growth in energy industries in Wyoming was:

- Among drilling oil and gas wells businesses, the number of employer establishments grew by 23.5 percent, including growth of 4.9 percent among establishments with less than 20 workers and 22.4 percent among establishments with less than 500 workers.
- Among supporting oil and gas operations businesses, the number of employer establishments grew by 13.8 percent, including growth of 9.3 percent among establishments with less than 20 workers and 13.9 percent among establishments with less than 500 workers.
- Among oil and gas pipeline and related structures construction businesses, the number of employer establishments grew by 35.2 percent, including growth of 32.4 percent among establishments with less than 20 workers, and 33.3 percent among establishments with less than 500 workers.

- Among oil and gas field machinery and equipment manufacturing businesses, the number of employer establishments grew by 27.3 percent, including growth of 27.3 percent among establishments with less than 500 workers.

The growth in both jobs and small-midsize employer establishments in the energy sector has been striking in recent years, especially given the abysmal performance of the overall economy.

Finally, it must be noted that the Wyoming energy sector in fact is not all about big businesses. As noted in Table 61, each energy sector looked at is overwhelmingly populated by small and midsize firms.

- Among oil and gas extraction businesses, 75.1 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.
- Among drilling oil and gas wells businesses, 70.2 percent of employer establishments in 2012 had less than 20 workers, and 99.2 percent had fewer than 500 employees.
- Among support for oil and gas operations businesses, 80.4 percent of employer establishments in 2012 had less than 20 workers, and 99.4 percent had fewer than 500 employees.
- Among oil and gas pipeline and related structures construction businesses, 67.1 percent of employer establishments in 2012 had less than 20 workers, and 98.6 percent had fewer than 500 employees.
- Among oil and gas field machinery and equipment manufacturing establishments, 42.9 percent of employer establishments in 2012 had less than 20 workers, and 100 percent had fewer than 500 employees.



**Table 61: Establishments – Wyoming Total and Energy Industries, 2005-2012**

**Wyoming Total Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	19,736	17,804	19,715	90.2%	99.9%
2012	20,635	18,580	20,614	90.0%	99.9%
WY 05-12	4.6%	4.4%	4.6%		
US 05-12	-0.9%	-1.0%	-0.9%		

**Oil/Gas Extraction Employer Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	205	159	205	77.6%	100%
2012	173	130	173	75.1%	100%
Chg 05-12	-15.6%	-18.2	-15.6%		

**Drilling Oil and Gas Wells Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	98	81	98	82.7%	100%
2012	121	85	120	70.2%	99.2%
Chg 05-12	23.5%	4.9%	22.4%		

**Support for Oil and Gas Operations Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	412	345	409	83.7%	99.3%
2012	469	377	466	80.4%	99.4%
Chg 05-12	13.8%	9.3%	13.9%		

**Oil and Gas Pipeline and Related Structures Construction Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	54	37	54	68.5%	100%
2012	73	49	72	67.1%	98.6%
Chg 05-12	35.2%	32.4%	33.3%		

**Oil and Gas Field Machinery and Equipment Manufacturing Establishments**

	Total	By Number of Employees		As Percent of Total Firms	
		Less 20	Less 500	Less 20	Less 500
2005	11	8	11	72.7	100%
2012	14	6	14	42.9%	100%
Chg 05-12	27.3%	-25.0%	27.3%		

## About the Author

Raymond J. Keating is the chief economist for the Small Business & Entrepreneurship Council. Keating also serves as an adjunct professor at the Townsend School of Business at Dowling College in New York where he teaches graduate courses on innovation and entrepreneurship, international business, organizational behavior, strategic management, public sector economics, and introduction to management.

In addition, Keating writes a weekly column for *Long Island Business News*. Keating's analysis and commentary pieces also have appeared in such publications as *The New York Times*, *The Wall Street Journal*, *The Washington Post*, *The Washington Times*, *Boston Globe*, *Newsday*, *Los Angeles Daily News*, and many others.

Keating has testified before congressional and state legislative bodies, and has spoken to groups across the nation on a wide range of economic, policy and small business topics. The media taps him regularly for his views, including print, radio and television (for example, NBC, CNBC, Fox News, Fox Business Network, CNN, PBS, etc.) interviews.

# Endnotes

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- 14 Census Bureau industry definition: "This U.S. industry comprises establishments primarily engaged in performing support activities on a contract or fee basis for oil and gas operations (except site preparation and related construction activities). Services included are exploration (except geophysical surveying and mapping); excavating slush pits and cellars, well surveying; running, cutting, and pulling casings, tubes, and rods; cementing wells, shooting wells; perforating well casings; acidizing and chemically treating wells; and cleaning out, bailing, and swabbing wells."
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