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# **The Contributions of the Natural Gas Industry to the U.S. National and State Economies**

*Executive Summary*

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## Executive Summary

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The contribution of natural gas to the U.S. energy economy is clear: according to the U.S. Energy Information Administration, it currently constitutes approximately 25% of total primary energy consumption and 29% of primary energy production in the United States, when measured on a Btu-equivalent basis. Natural gas production is almost double that of crude oil. The role of natural gas in the overall U.S. economy is also significant, but its quantification is more complex. This study represents the first systematic attempt to measure the impact of natural gas on the total U.S. as well as on individual states' economies. No previous report has attempted to quantify the economic impact of the natural gas industry at this study's level of detail.

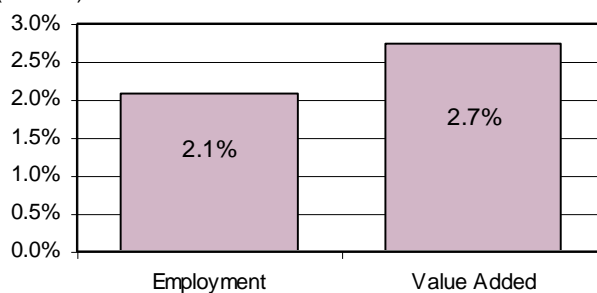
To gauge the place of natural gas in the economy, IHS Global Insight calculated the number of workers, value added, and labor income associated—directly or indirectly—with providing natural gas to consumers. The "induced" impacts caused by the expenditure of natural gas workers' income were also quantified.

### Results

Direct, indirect, and induced natural gas related employment equaled 2.1% of total U.S. employment in 2008, while value added from natural gas related activities contributed 2.7% of U.S. output.

#### Natural Gas Industry Contributions to the U.S. Economy in 2008

(Percent)



**Total Natural Gas Employment Was Nearly 3 Million in 2008.** IHS Global Insight found 2.8 million jobs attributable to the natural gas industry. More than 600,000 jobs were directly involved in exploring, producing, transporting, and delivering natural gas to consumers or in providing critical supplies or onsite services to the natural gas industry. These jobs are referred to as "direct" jobs. More than 700,000 additional jobs in other industries that supplied the natural gas industry were quantified through modeling techniques; these are referred to as "indirect" jobs. The remaining 1.5 million jobs represent an estimate of the jobs "induced" when workers holding direct and indirect natural gas related jobs spent their income creating a demand for goods and services.

**Value Added Economic Impact by Natural Gas Reached \$385 Billion in 2008.** The direct economic impact of the natural gas industry, as measured by its value added, is estimated at approximately \$170 billion. Value added equals the value of an industry's output minus the costs of its material and services inputs. Indirect and induced impacts bring the total value added contribution by natural gas to the economy to \$385 billion.

**Labor Income from Natural Gas in 2008.** Labor income totaled \$70 billion for direct natural gas jobs and over \$180 billion for total (direct, indirect, and induced) jobs.

**Natural Gas Impact on the U.S. Economy**

	Direct	Indirect & Induced	Total
<b>Employment (Thousands)</b>			
2006	517	1,902	2,420
2007	587	2,106	2,693
2008	622	2,206	2,828
<b>Value Added (Billions of dollars)</b>			
2006	147	184	331
2007	162	202	364
2008	172	213	385
<b>Labor Income (Billions of dollars)</b>			
2006	60	97	157
2007	66	107	173
2008	70	111	181

**The Role of Natural Gas Increased During 2006-08.** The contributions of the natural gas industry to the U.S. economy increased each year between 2006 and 2008. Direct employment rose by more than 100,000 jobs, while total employment (direct, indirect, and induced) increased by more than 400,000 jobs and value added grew by nearly \$50 billion during the same period.

**Natural Gas Contributions Are Spread Across the Country.** The influence of the natural gas industry on the economy is spread throughout the continental United States. Although natural gas drilling and production workers are most heavily concentrated in the largest natural-gas producing states, workers in those activities are employed in a majority of the states. Employment in other parts of the natural gas industry, such as transportation and distribution, is even more widespread. In 2008, 33 states had at least 2,000 workers directly involved in natural gas activities, with 22 of these having at least 4,000. All continental states have natural gas related jobs. When indirect and induced jobs are included, 31 states had at least 10,000 jobs related to the natural gas industry.

The economic value of the natural gas industry, as measured by total direct, indirect, and induced value added, accounted for 1% or more of gross state product in 34 states in 2008 and 2% or higher in 17 states.

## State-Level Summary of Natural Gas Employment and Economic Contributions in 2008

	Natural Gas Employment (Annual average)				Natural Gas Value Added (\$ millions)			
	Direct	Indirect & Induced	Total	% of State	Direct	Indirect & Induced	Total	% of State
				Total				Total
Alabama	6,583	14,724	21,307	1.1%	1,825	2,950	4,775	2.8%
Alaska	1,703	4,122	5,824	1.8%	611	268	878	1.8%
Arizona	3,337	9,538	12,875	0.5%	811	2,242	3,053	1.2%
Arkansas	9,138	20,668	29,806	2.5%	2,253	3,315	5,568	5.6%
California	43,493	211,720	255,214	1.7%	13,296	23,377	36,673	2.0%
Colorado	30,758	106,968	137,726	5.9%	8,519	9,791	18,309	7.3%
Connecticut	1,694	5,677	7,371	0.4%	507	1,251	1,758	0.8%
Delaware	100	349	449	0.1%	31	97	129	0.2%
Florida	3,448	12,006	15,454	0.2%	832	3,283	4,115	0.6%
Georgia	2,841	8,384	11,224	0.3%	710	2,054	2,764	0.7%
Hawaii	0	0	0	0.0%	0	0	0	0.0%
Idaho	964	2,307	3,272	0.5%	307	588	895	1.7%
Illinois	7,832	37,958	45,790	0.8%	2,129	4,283	6,412	1.0%
Indiana	4,477	12,671	17,148	0.6%	1,191	2,757	3,947	1.5%
Iowa	1,212	2,388	3,600	0.2%	334	724	1,057	0.8%
Kansas	6,134	14,625	20,759	1.5%	2,069	2,231	4,300	3.5%
Kentucky	4,397	9,992	14,389	0.8%	1,429	2,400	3,829	2.4%
Louisiana	62,581	204,010	266,591	13.7%	13,044	11,427	24,471	11.0%
Maine	200	370	571	0.1%	60	110	169	0.3%
Maryland	1,762	5,956	7,718	0.3%	351	1,236	1,587	0.6%
Massachusetts	3,295	11,637	14,932	0.5%	1,049	2,557	3,607	1.0%
Michigan	5,781	17,286	23,067	0.6%	1,844	3,917	5,762	1.5%
Minnesota	2,793	7,731	10,524	0.4%	716	2,032	2,748	1.0%
Mississippi	8,746	18,639	27,385	2.4%	1,495	1,634	3,129	3.4%
Missouri	3,679	9,225	12,904	0.5%	1,150	2,708	3,857	1.6%
Montana	1,620	4,815	6,435	1.4%	483	565	1,049	2.9%
Nebraska	2,286	7,282	9,567	1.0%	685	520	1,205	1.4%
Nevada	2,321	6,000	8,321	0.7%	691	1,476	2,168	1.6%
New Hampshire	252	621	873	0.1%	85	186	271	0.5%
New Jersey	4,880	20,951	25,831	0.6%	1,411	4,105	5,516	1.2%
New Mexico	14,534	31,527	46,062	5.4%	4,303	3,142	7,445	9.3%
New York	7,772	28,875	36,647	0.4%	1,957	6,394	8,352	0.7%
North Carolina	3,104	8,528	11,632	0.3%	803	2,071	2,874	0.7%
North Dakota	1,159	2,579	3,738	1.0%	254	207	461	1.5%
Ohio	9,994	30,380	40,374	0.8%	3,272	6,918	10,190	2.2%
Oklahoma	44,165	130,353	174,519	10.9%	14,789	9,550	24,339	16.6%
Oregon	1,799	5,116	6,915	0.4%	550	1,295	1,845	1.1%
Pennsylvania	12,245	41,308	53,554	0.9%	3,915	9,017	12,932	2.3%
Rhode Island	494	1,632	2,126	0.4%	152	278	431	0.9%
South Carolina	1,152	2,560	3,712	0.2%	364	875	1,239	0.8%
South Dakota	615	1,126	1,742	0.4%	173	273	446	1.2%
Tennessee	3,224	8,681	11,905	0.4%	913	2,658	3,571	1.4%
Texas	249,049	1,020,081	1,269,130	12.0%	69,379	63,229	132,608	10.8%
Utah	8,896	30,339	39,236	3.1%	2,219	3,155	5,374	4.9%
Vermont	96	171	267	0.1%	32	50	82	0.3%
Virginia	4,683	10,362	15,045	0.4%	1,142	2,798	3,939	1.0%
Washington	2,380	8,834	11,214	0.4%	590	1,750	2,340	0.7%
West Virginia	5,652	9,930	15,582	2.0%	1,668	1,317	2,985	4.8%
Wisconsin	1,622	4,101	5,723	0.2%	328	907	1,235	0.5%
Wyoming	21,470	40,836	62,306	20.9%	5,419	2,627	8,045	22.7%
U.S. Total	622,412	2,205,939	2,828,352	2.1%	172,139	212,595	384,735	2.7%



## How the Impacts Were Measured

The analysis of the natural gas industry's impact on the U.S. economy was conducted in two parts, as follows.

**Part One: Direct Jobs Were Counted.** First, direct jobs were measured for the most significant segments of the natural gas industry. The starting point for the analysis was employment data reported by the U.S. Bureau of Labor Statistics (BLS), which sort employment statistics according to the federal government's North American Industrial Classification System (NAICS). A total of 13 industrial categories were identified as being directly related to natural gas, according to the definition of "direct" relationship described previously. Two of the categories (drilling services and support activities for oil and gas operations) were then combined for the analysis of upstream drilling and support activities. The table below shows the natural gas related employment portions of these NAICS categories. Italics indicate estimates by IHS Global Insight to attribute portions of aggregate employment categories to natural gas.

### Direct Natural Gas-Related Employment by Industrial Category, U.S. Totals (Annual average workers)

	2006	2007	2008
<i>Natural gas extraction</i>	89,683	99,504	112,064
<i>Drilling and support activities for natural gas operations</i>	148,598	185,514	192,961
Natural gas distribution	115,170	114,941	115,853
<i>Natural gas pipeline construction</i>	56,794	66,137	75,558
<i>Manufacture of field machinery/equipment for natural gas operations</i>	33,794	38,642	41,452
<i>Site preparation services for natural gas operations</i>	25,993	33,329	35,349
Pipeline transportation of natural gas (includes storage)	27,685	27,431	27,078
<i>Geophysical services for natural gas operations</i>	6,108	6,847	7,365
<i>Building/repairing offshore platforms used in natural gas operations</i>	5,111	5,624	5,845
Natural gas liquid extraction	4,670	4,842	5,179
<i>Manufacture of compressors used in natural gas lines</i>	2,196	2,226	2,229
<i>Manufacture of pumps used in natural gas wells</i>	1,431	1,465	1,480
<b>Total Direct Jobs</b>	<b>517,233</b>	<b>586,502</b>	<b>622,412</b>

Note: Italics indicate estimates by IHS Global Insight

Three of 13 industrial categories analyzed were devoted exclusively to natural gas jobs. A variety of methods were used to quantify the portions of the remaining 10 aggregate government employment categories attributable to natural gas and supplement nonpublished-data gaps. These efforts were based on other government and industry information as well as IHS Global Insight in-house data and modeling resources.

For the principal drilling and development employment categories, a methodology was developed to translate expenditures on natural gas drilling and production into jobs. The structure for this system was established by identifying the most important well activities, in consultation with industry experts, and the data were collected from a variety of public and private sources.

**Part Two: Model Solutions to Complete the Analysis.** Second, the IMPLAN model was used to measure the indirect and induced jobs, value added, and labor income. The IMPLAN model is a widely-used commercially available model based in part on input-output data from the U.S. Bureau of Economic Analysis (BEA). This model traces supply and demand for all products and services using inter-industry and final demand linkages.

For this analysis, the direct natural gas jobs calculated in part one were provided as a key input into a national-level solution of the IMPLAN model. IHS Global Insight's Business Market Insights (BMI) modeling system was then used to provide state-level employment, value added, and labor income figures consistent with the national-level results from the IMPLAN model. The direct employment model results were synchronized with the state-level figures calculated in part one.