

Deloitte Survey of Oil and Gas Professionals

Age of Plenty Predicted for Natural Gas

Methodology

Deloitte conducted 200 quantitative interviews among oil and gas professionals from October 30 - November 5, 2009. All respondents are energy sector employees who have worked in the industry for at least five years, are college educated and earn at least \$100,000 per year.

Study Highlights

Abundant Natural Gas Resources Predicted

The most widespread agreement among survey respondents was that natural gas resources would be plentiful well into the future.

- **The overwhelming majority of survey respondents, 84%, say the best days for the natural gas industry segment are still ahead of us** – a finding that definitively confirms what has become a common sentiment among many energy pundits: America’s energy future will become far more closely aligned with natural gas than we thought just a few years ago. Current industry thinking would attribute this dramatic rise in affinity for natural gas to a recent surge in America’s gas reserves, which have doubled over the past two years thanks to remarkable advances in technology used to produce unconventional fuel sources such as shale gas.
- **While oil is expected to remain the single most widely used energy source in the U.S. for some time, its usage is expected to decline over time.** The number of respondents that expect oil to remain the most widely used fuel source in the U.S. drops 16 points over the next five years – sinking from 57% who currently think oil is the most widely used overall fuel source to 41% who believe oil will dominate in 2015.
- In contrast, **expectations that natural gas will be the most widely used fuel source by 2015 double over the next five years**, rising from one in ten respondents who see natural gas as the currently dominant fuel source to almost one quarter (24%) who believe it will dominate in 2015. Current industry thinking would indicate that much of the rising demand for natural gas will be for power generation.
- Additionally, **almost one in ten respondents expect unconventional natural gas to be the main source of energy in five years – as well as an additional four percent who think it will be liquid natural gas (LNG)** – further elevating the status of natural gas in respondents’ views as a critical energy source.
- When it comes to fossil fuel production, **85% of respondents believe the U.S. production of natural gas will increase in the next five years, compared to only 45% who think American oil production will increase during the same time period.**
- **More survey respondents believe oil prices will increase than believe natural gas prices will increase.** More than half of them (51%) believe the price of oil will greatly increase over the next five years, which is almost 20 points more than the 32% of respondents who see the price of natural gas greatly increasing in the same time period, probably due to the abundant supply of natural gas versus increasingly constrained oil supplies.

Some Form of Climate Change Legislation Expected to Pass, Impacting Industry and Consumers

Respondents were also in accord when it comes to climate change legislation – anticipating that some form of the legislation would pass within two years, but that it would penalize oil and gas companies, while also increasing fuel prices for consumers:

- **A solid majority of respondents (60%) think that some form of the climate change legislation currently under discussion in Congress will be finalized and passed within the next two years** – and a mere 14% think Congress will never pass such legislation.

While oil and gas professionals are split on whether or not climate change legislation will reduce greenhouse gas emissions, they are united in their opinions that it will push consumer prices higher and penalize oil and gas companies:

- Over 90% of respondents say that **climate change legislation will lead to higher gasoline and natural gas prices** for consumers.
- A full three quarters (75%) of all respondents expect that **climate change legislation will lead to significantly lower profits** for oil and gas companies.
- Sixty-eight percent (68%) of all respondents say that **climate change legislation will lead to more layoffs in the industry**.
- Most oil and gas professionals (76%) believe that **climate change legislation is not likely to create more jobs for Americans**.

All of this speaks to a general concern about the effectiveness of governmental energy policies among oil and gas professionals:

- The survey reveals that **most oil and gas professionals (76%) think the energy industry is heading in the wrong direction**.
- Almost the exact same amount (63%) say it is **in worse shape now than it was even a year ago**.

Uncertainty About Layoffs and Expense Cutting Persists

When the survey looked at recession-related business issues, it found that concerns about layoffs and expense cutting persisted among oil and gas professionals:

- Almost one in two oil and gas professionals expects that **layoffs in the industry will increase over the next year**.
- Most oil and gas professionals say their companies are **reducing operating expenses (75%)** and many say their companies are **reducing overall capital expenditures (56%)** in response to the recession.

Optimism about Exploration and Production Revenues Abounds

Despite these concerns, respondents do not expect revenues to shrink in the various oil and gas industry sectors in the next year, with the exception of the refining sector:

- Seventy-six percent (76%) expect revenues to grow at **national oil companies**.
- Seventy-six percent (76%) expect revenues to grow at **international oil companies**.
- Sixty-seven percent (67%) expect revenues to grow at **independent exploration and production companies**.
- Sixty-one percent (61%) expect revenues to grow at **supply and service companies**.
- Fifty-eight percent (58%) expect revenues to grow at **outside energy consultancies**.
- Thirty-five percent (35%) expect revenues to grow at **refining companies**.

The survey also showed that, contrary to speculation by many analysts about mergers and acquisition in the energy sector, most oil and gas professionals do not currently see any such activity at their own companies:

- When asked how their individual companies are responding to current oil and gas prices, only 14% say their company is **pursuing a merger or acquisition**.

Energy Independence will be Hard to Achieve in the Near Term

A final area of interest in the survey concerned energy independence. Oil and gas professionals are more or less evenly split on whether or not the U.S. can realistically achieve energy independence:

- **Fifty-three percent (53%) say the U.S. can achieve independence**, while 46% say it cannot. Among the half that believes it is possible, most don't expect it for at least 15 years.
- These energy independence concerns are complicated by climate change legislation. **The majority of oil and gas professionals (62%) think climate change legislation will worsen the U.S. dependence on foreign nations for oil.**

Full Findings

(Note: Numbers may not add up to 100 due to rounding.)

General energy perceptions

Overall, there is a sense of pessimism among oil and gas professionals. Not only do 62% of them think that the overall situation in the country is going in the wrong direction, but three out of four of them also see their own field, energy, to be on the wrong track.

In general, do you think things are going in the right direction or the wrong direction?	Overall things in the nation	National energy situation
Right direction	33	21
Wrong direction	62	76
Don't know	5	4

Oil and gas professionals see this trend as very acute – 63% think that the energy situation is worse than it was just a year ago.

Do you think the national energy situation is better or worse than it was one year ago?	All
Better	24
Worse	63
Don't know	14

Almost half of oil and gas professionals expect that layoffs in the industry will increase over the next year.

Over the next year, do you think that layoffs at companies focused on ... will:	Oil	Natural Gas
Increase/decrease	47/53	39/58
Greatly increase	7	4
Somewhat increase	40	35
Somewhat decrease	45	50
Greatly decrease	8	8
Don't know	2	5

Most oil and gas professionals say their companies are reducing operating expenses and capital expenditures. Note that only 14% are pursuing a merger or acquisition.

Please think specifically about your company. How is your company responding to current oil and gas prices? Multiple responses permitted	All
Reducing operating expenses	75
Reducing capital expenditures	56
Cutting exploration	14
Pursuing a merger or acquisition	14
Cutting production	9
My company is not doing anything to respond to current oil and gas prices	7
Other	9
Don't know	3

Respondents also don't expect shrinking revenues in the various oil and gas industry sectors in the near future, with the exception of refining companies.

Do you expect their revenue (grow/shrink) in the next ... Showing grow/shrink	1 Year	5 Years
NOCs (National Oil Companies)	76/22	80/19
IOCs (International Oil Companies)	76/24	82/16
Independent exploration and production companies	67/33	74/25
Supply and service companies	61/38	76/22
Outside energy consultancies	58/38	68/27
Refining companies	35/63	55/43

Oil and gas professionals say that the two main energy problems facing America today are: (1) the availability of energy sources and (2) bad government policy.

What do you think is the most important energy issue facing America today?	All
Coded open ended answers	
Need more energy independence/too dependent on foreign oil	19
Need more renewable energy/alternative energy/green/clean energy/dependence on fossil fuels	16
Domestic drilling restrictions	10
Cap and Trade legislation/carbon credits	9
Energy supply/oil shortage	7
Government interference/New taxes	6
No domestic production/no access to our reserves/not enough energy/oil and gas exploration	6
Lack of a decent/long term energy policy/lack of political interest	6
Excessive consumption/conservation/need more emphasis on conservation	4
Natural gas/lack of support for natural gas use	3
Nuclear energy/lack of support for nuclear energy use/need to maintain oil production and use nuclear energy	3
Carbon emissions/climate change/global warming	3
Others	12

The same two issues (i.e., the availability of energy sources and bad government policy) also apply when oil-focused companies are looked at separately from gas-focused companies. While government regulation is seen as one of the top challenges to both segments of the oil and gas industry, access and availability of oil is seen as a much more pressing issue for oil-focused companies than for gas-focused companies. On the other hand, commodity price volatility is viewed as a greater challenge for the gas-focused companies than for the oil-focused companies.

Looking exclusively at [oil/natural gas] what do you think are the greatest challenges each industry segment now faces?	Oil	Natural gas
Multiple responses permitted		
Government regulation	54	50
Access to supplies of fossil fuels	47	32
Geopolitical risk (e.g., resource nationalization, threats to supply lines)	41	24
Declines in reserves	27	7
Commodity price volatility	26	35

Looking exclusively at [oil/natural gas] what do you think are the greatest challenges each industry segment now faces? Multiple responses permitted	Oil	Natural gas
Hedging and financial investors	17	15
The cost of inputs (e.g., raw materials, labor)	10	12
Declines in demand	6	7
Other	5	11
Don't know	1	4

Not surprisingly, respondents active in the oil and gas industry have a very favorable general view of their “bread and butter” — conventional natural gas and domestic oil. They are also positive on other forms of gas and oil, nuclear and general renewable sources. They are split on coal and have a negative view of imported oil and corn-based ethanol.

Do you have a ... view of the energy source? Showing very favorable over favorable/unfavorable	All
Conventional natural gas	74 97/4
Domestic oil	71 92/9
Liquid natural gas (LNG)	50 93/7
Unconventional natural gas (gas shales, tight gas, methane gas)	49 90/10
Renewable energy sources (solar, wind, etc.)	48 86/14
Nuclear	47 82/17
Unconventional oil (oil sands, oil shales, etc.)	38 81/19
Hydrogen	23 63/30
Second generation biofuels (e.g., cellulosic ethanol, algae)	19 57/38
Coal	13 47/54
Imported oil	8 36/65

The ascendance of natural gas

Oil and gas professionals are split on whether the U.S. can realistically achieve energy independence. Among the half that believes it is possible, most don't expect it for at least 15 years.

Do you think the U.S. can realistically achieve energy independence?	All
Yes	53
No	46
Don't know	2

When do you believe the U.S. will be able to achieve energy independence? Among those who said Yes	All
Up to 5 years from now	5
5 to 9 years from now	9
10 to 14 years from now	29
15 to 19 years from now	13
20 or more years from now	38
Never	6
Don't know	1

On average, oil and gas professionals believe that the world will run out of reasonably priced oil in the next 50 years, and the U.S. within 25 years. In terms of reasonably priced natural gas, respondents don't foresee dramatic shortages for the next 50 years in the U.S. and 100 years worldwide.

How many years do you think it will take until ... (open end)	The world runs out of reasonably priced oil	The U.S. runs out of reasonably priced domestic oil
Less than 25	29	54
25 to 49	23	21
50 to 99	31	15
100 or more	17	9

How many years do you think it will take until ... (open end)	The world runs out of reasonably priced natural gas	The U.S. runs out of reasonably priced natural gas
Less than 25	9	17
25 to 49	20	24
50 to 99	26	25
100 or more	45	34

Respondents agree that global demand for both oil and natural gas is going to increase over the next year. While they agree that demand for both will also increase in the U.S., they are slightly less bullish about oil in the U.S. than globally.

Do you think [oil/natural gas demand] will ... Showing greatly increase over increase/decrease	Oil	Natural Gas
Global demand for ... in the next year.	23 92/9	16 94/6
U.S. demand for ... in the next year.	10 84/16	12 91/8

The major difference between respondents' outlook on oil and their outlook on gas comes to fore when asked where they see the levels of U.S. production in the future. Three in four believe the U.S. production of natural gas will increase next year and 85% believe it will increase in the next five five years. At the same time, only 45% think American oil production will increase in the next five five years.

Do you think [oil/natural gas production] will ... Showing greatly increase over increase/decrease	Oil	Natural Gas
U.S. production of ... in the next year.	2 41/60	12 73/26
U.S. production of ... in the next five years.	7 45/55	26 85/15

While oil is still expected to be the single most widely used energy source in the U.S. in five years, its importance is expected to decline (41% of respondents expect it to be the most widely used energy source in the U.S. five years from now, 16 points lower than now).

Conventional natural gas is expected to more than double in its prominence (24% think it will be the dominant energy source in five years, compared to ten percent currently) and surpass the use of coal (only 17% think it will be the most widely used energy source, compared to 30% today).

Additionally, almost one in ten expect unconventional natural gas to be the main source of energy in five years (as well as additional 4% who think it will be LNG), further elevating the status of natural gas in oil and gas professionals' views as a critical energy source.

What do you think is/will be the most widely used energy source in the U.S. ...?	Today	5 years from now
Conventional oil	57	41
Coal	30	17
Conventional natural gas	10	24
Unconventional natural gas (gas shales, tight gas, methane gas)	1	9
Liquid natural gas	1	4
Unconventional oil (oil sands, oil shales, etc.)	1	2
Renewable energy sources (solar, wind, etc.)	1	2
First generation biofuels (corn-based ethanol)	0	1
Second generation biofuels (e.g., cellulosic ethanol, algae)	0	1
Don't know	1	1

Furthermore, oil and gas professionals consider natural gas to be the most promising alternative transportation fuel to crude oil, beating the rest of alternatives by a better than two-to-one margin. Also, it is evident that respondents have a low regard for first generation biofuels as a promising alternative to gasoline.

Which of the following do you think is the most promising transportation fuel alternative to crude oil derivatives?	Now	5 years from Now
Natural gas	40	38
Electricity (plug-in)	20	20
Second generation biofuels (e.g., cellulosic ethanol, algae)	14	19
Hydrogen	11	16
First generation biofuels (corn- based ethanol)	5	2
None of the above	7	4
Don't know	4	2

Finally, the trajectory of the increasing role of natural gas and decreasing role of oil in the minds of oil and gas professionals is evident when 60% of them say that the best days of the oil industry segment are behind us (only 11% say that about natural gas), while 84% say the best days are still ahead for natural gas industry segment.

Looking exclusively at oil, do you think that the best days of the...	Oil industry segment	Natural gas industry segment
Are behind us	60	11

Are still to come	33	84
Don't know	7	6

Despite the differing outlooks, oil and gas professionals don't expect a dramatic "divorce" between the oil segment and gas segment as eight of ten of them say that both segments will continue pursuing similar directions.

Do you see the oil segment and the gas segment as pursuing a similar direction together or pursuing separate directions?	All
Similar/different direction	79/21
Very much the same direction together	24
A somewhat similar direction together	55
Somewhat different directions	18
Very much different directions	3
Don't know	1

Oil and gas professionals believe that natural gas price volatility could be reduced with increased domestic supplies.

Do you believe that the rise of new domestic supplies of natural gas will help moderate historical price spikes?	All
Yes	68
No	25
Don't know	8

Climate change legislation

Most respondents think that climate change legislation currently being discussed in Congress will be finalized and passed within the next two years.

In your opinion, when is it likely that Congress will pass climate change legislation?	All
By the end of this year	3
Within the next year	32
Within the next two years	25
Two to three years from now	12
Four years from now or later	9
Never	14
Don't know	7

Whatever form and shape the final climate change bill might have, oil and gas professionals are likely to oppose it. They are split on whether it will reduce greenhouse gas emissions, but united in their opinion that it will lead to higher gasoline and natural gas prices for consumers. They expect it will lead to lower profits and more layoffs in the industry, while at the same time not creating more jobs elsewhere and exacerbating what they see as one of the crucial energy problems of today – U.S. dependence on foreign nations for energy.

Now, let's assume that Congress does pass some form of climate change legislation. Please think of what you think is most likely that legislation is going to contain and describe the likelihood of the following outcomes as a result of the legislation. If Congress passed climate legislation, would this be: Showing more likely/less likely	All
Higher gasoline prices for consumers	91/10
Higher natural gas prices for consumers	87/13
Significant reductions in profits for the oil and gas industry	75/23
Significant layoffs in the oil and gas industry	68/29
Significant decreases in exploration for oil and natural gas reserves	66/32
Significant decreases in production of oil and natural gas	56/42
Lower greenhouse gas emissions	54/45
Increased U.S. energy independence	37/62
More jobs for Americans	22/76
Reductions in federal, state, or local tax	19/81

Respondents' optimism about natural gas is reflected also on the climate question. Over 90% state that natural gas should play a greater role in American energy policy to reduce carbon and greenhouse gas emissions.

What role should natural gas play in American energy policy to reduce carbon and greenhouse gas emissions?	All
Greater role/Less role	92/6
Much greater role	60
Somewhat greater role	32
Somewhat less role	4
Much less role	2
Don't know	3



Center for Energy Solutions

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