Dallas Fed
Energy Survey

Third Quarter | September 28, 2016

Oil and Gas Activity Rises in Third Quarter

Business activity increased in the third quarter, according to oil and gas executives responding to the Dallas Fed Energy Survey. The business activity index—the survey's broadest measure of conditions facing Eleventh District energy firms—strengthened to 26.7 from last quarter's 13.8 reading. Several indicators remained in contractionary territory, though. Overall, activity levels and outlooks improved, but the survey continues to reflect persistent weakness in oil and gas employment and production.

Oil and natural gas production fell for the third consecutive quarter according to exploration and production (E&P) firms, but at a slower rate than in previous quarters. The oil production index was -10.2, up from -19.7, and the natural gas production index was -20.6, up from -24.7 last quarter.

Among oil and gas (O&G) support services firms, the equipment utilization index surged 25 points, coming in at 24.1. Prices received for services dropped again this quarter, with the index coming in at -23.4.

Labor market indicators contracted on net this quarter, although the majority of firms reported no changes in jobs, hours or wages. The employment index remained negative but advanced to -6.5, with 13 percent of firms noting net hiring and 20 percent noting net layoffs. The employee hours index and the wages and benefits index also rose but remained negative at -1.9 and -9.7, respectively.

Capital spending expanded in the third quarter, with the corresponding index coming in at 11.4, a reversal from a reading of -9.3 in the second quarter. The index of expected E&P capital spending in 2017 remained positive at 21.8.

Six-month outlooks improved, with the index coming in at 19.6, similar to 19.0 last quarter. The company outlook index for E&P firms came in at 29.5, compared with 11.2 for support service firms.

Respondents continue to be bullish about oil and natural gas prices one-year ahead. Almost 62 percent believe oil prices will be higher than they currently are and 48 percent believe natural gas prices will increase. Comments from respondents suggest some increased uncertainty, though, with several raising concerns about continued oversupply and recent oil price weakness.

Next release: December 29, 2016

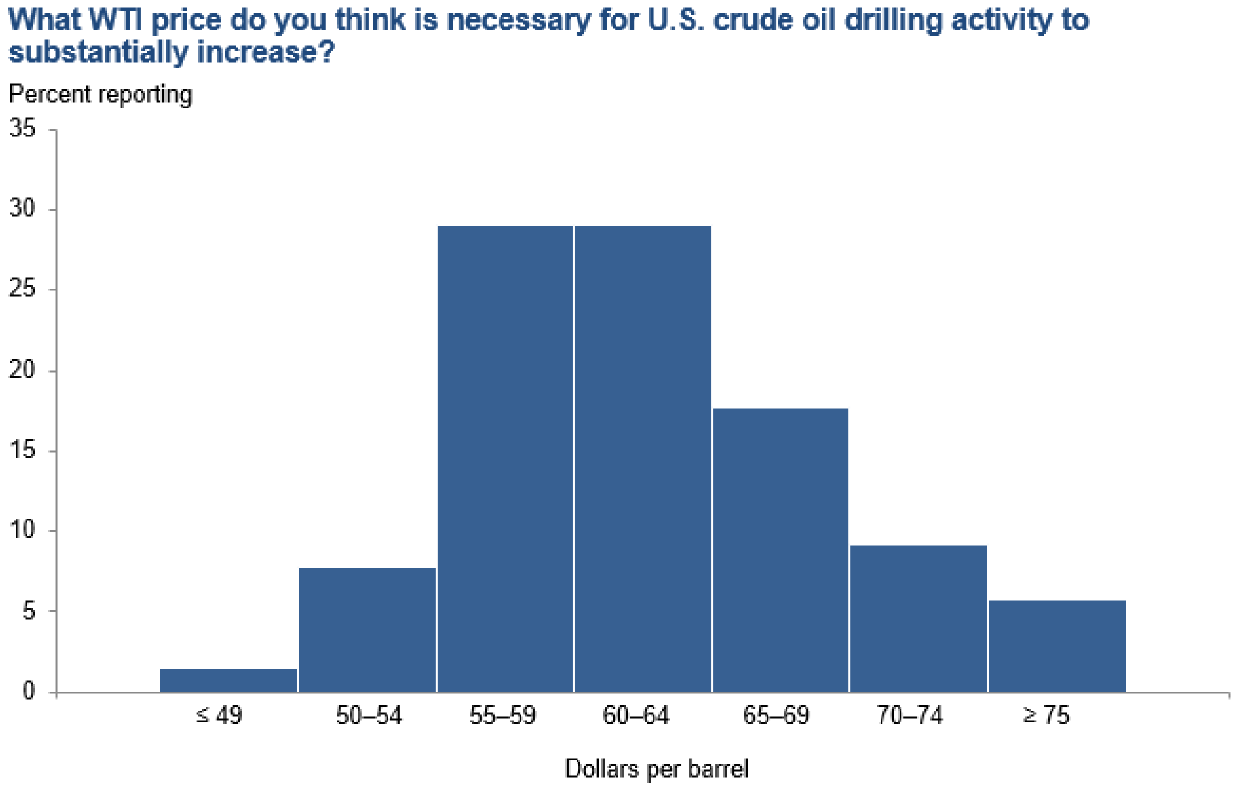
Data were collected Sept. 14–22, and 154 energy firms responded to the survey. Of the respondents, 70 were E&P firms and 84 were O&G support services firms.

The Dallas Fed conducts the Dallas Fed Energy Survey quarterly to obtain a timely assessment of energy activity among oil and gas firms located or headquartered in the Eleventh District. Firms are asked whether business activity, employment, capital expenditures and other indicators increased, decreased or remained unchanged compared with the prior quarter and with the same quarter a year ago. Survey responses are used to calculate an index for each indicator. Each index is calculated by subtracting the percentage of respondents reporting a decrease from the percentage reporting an increase. When the share of firms reporting an increase exceeds the share reporting a decrease, the index will be greater than zero, suggesting the indicator has increased over the previous quarter. If the share of firms reporting a decrease exceeds the share reporting an increase, the index will be below zero, suggesting the indicator has decreased over the previous quarter.

Special Questions

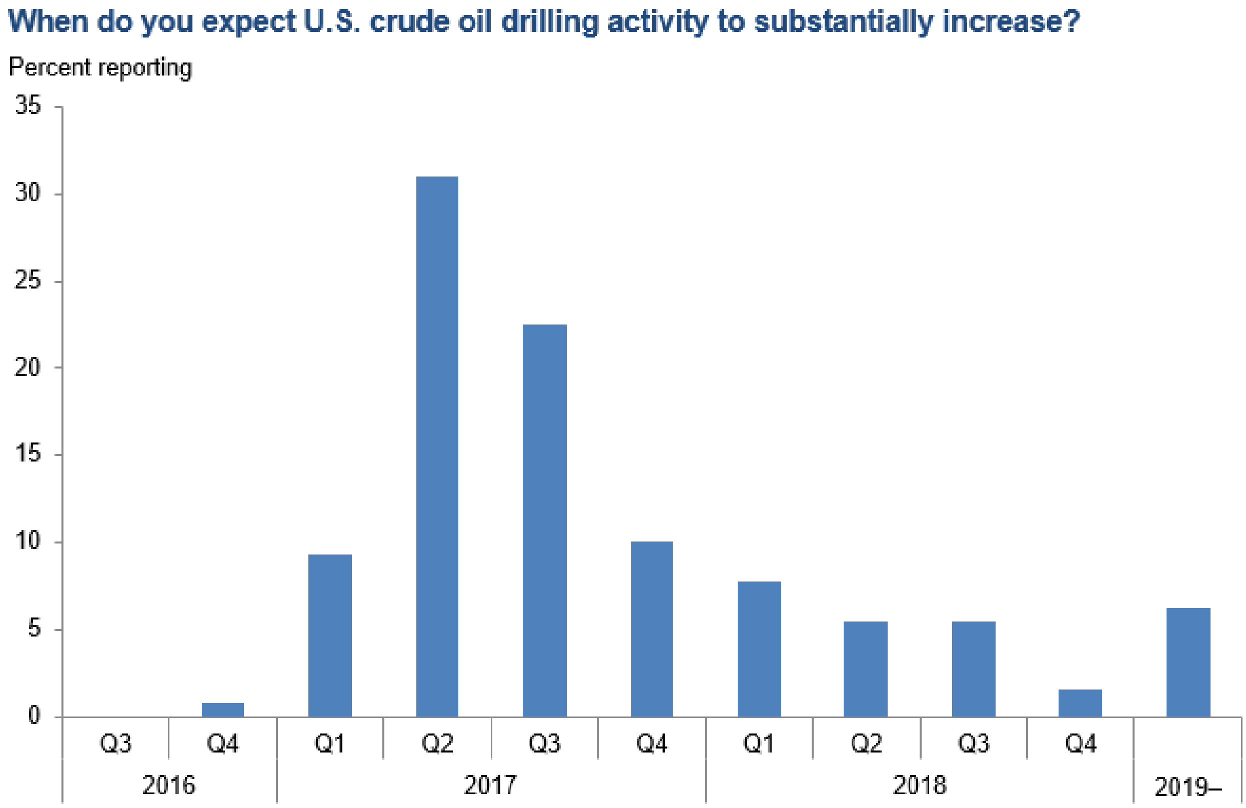
Data were collected September 14–22, and 149 oil and gas executives responded to the special questions survey.

What WTI price do you think is necessary for U.S. crude oil drilling activity to substantially increase? Respondents were nearly unanimous that WTI will need to be at or above $50 per barrel for activity to rise substantially, and over 90 percent think it will need to be $55 per barrel or more. The mean response was $60.20 per barrel, 36 percent above WTI's average spot price of $44.19 during the survey collection period.



NOTES: One hundred forty-one oil and gas firms answered this question from Sept. 14–22, 2016. Respondents were asked to assume Henry Hub natural gas prices remain near current levels.
SOURCE: Federal Reserve Bank of Dallas.

When do you expect U.S. crude oil drilling activity to substantially increase? The most frequent response was second quarter 2017. Over 70 percent of respondents expect drilling for crude in the U.S. will substantially increase sometime before first quarter 2018.



NOTE: One hundred twenty-nine oil and gas firms answered this question from Sept. 14–22, 2016.
SOURCE: Federal Reserve Bank of Dallas.

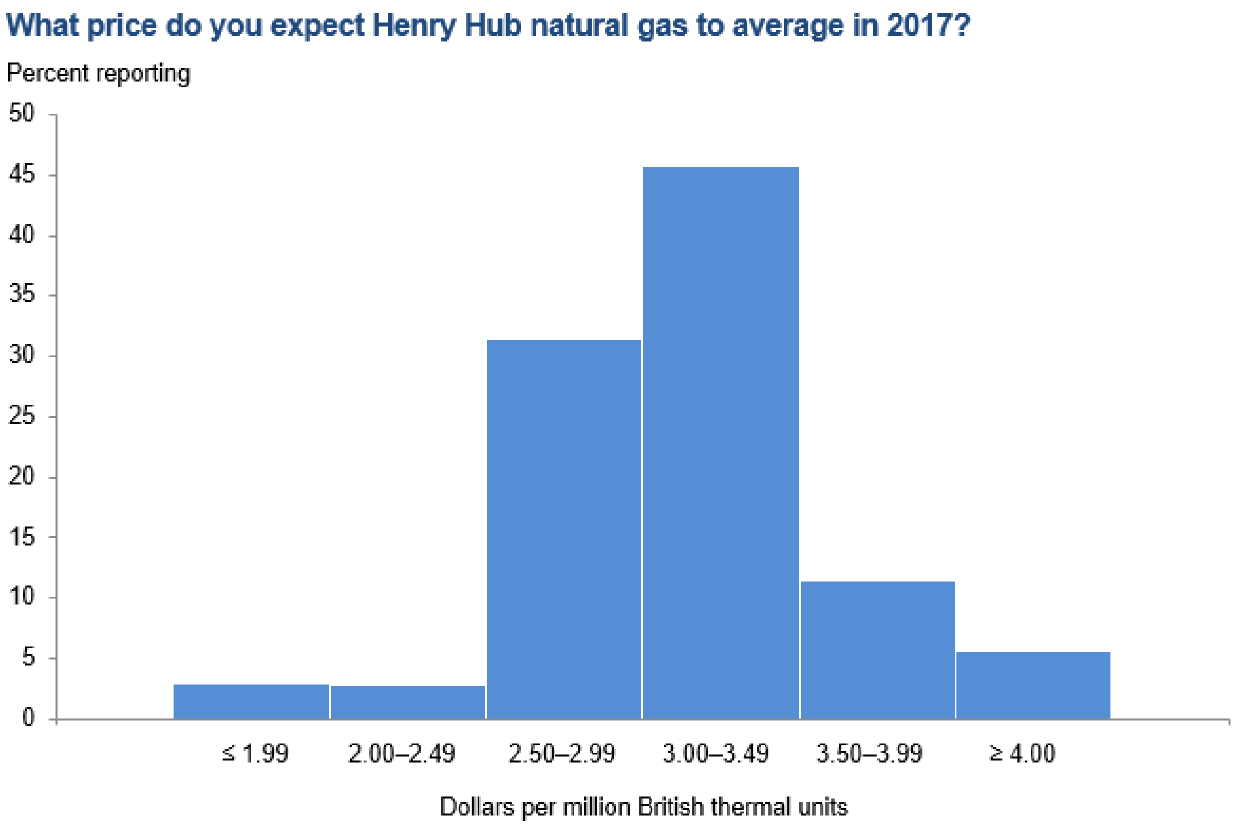
Finally, participants were presented with eight factors considered likely to impede significant increases in activity and allowed to select the degree to which each one would be an impediment for their firm. The factors most commonly cited as relatively major problems included low natural gas prices, a shortage of workers and balance sheet issues.

To what extent do you expect each of the following to impede your firm's ability to ramp up activity when the time comes to do so?

	Percent reporting					
	Relatively minor problem 1	2	3	4	Relatively major problem 5	No. of respondents
Cost and terms of credit	31	19	15	19	18	124
Higher costs due to more drilling activity industrywide	21	23	28	13	16	133
Inability of support service firms to increase their production	19	26	20	18	17	133
Inability of other suppliers to increase their production	20	31	23	17	9	134
Low natural gas prices	9	19	16	23	33	133
Need to repair balance sheet	30	11	17	16	26	129
Shortage of rigs / other equipment	29	22	25	13	11	134
Shortage of workers	19	19	13	21	27	136

NOTES: One hundred forty-four oil and gas firms responded to this question from Sept. 14–22, 2016. Percents may not sum to 100 due to rounding.
SOURCE: Federal Reserve Bank of Dallas.

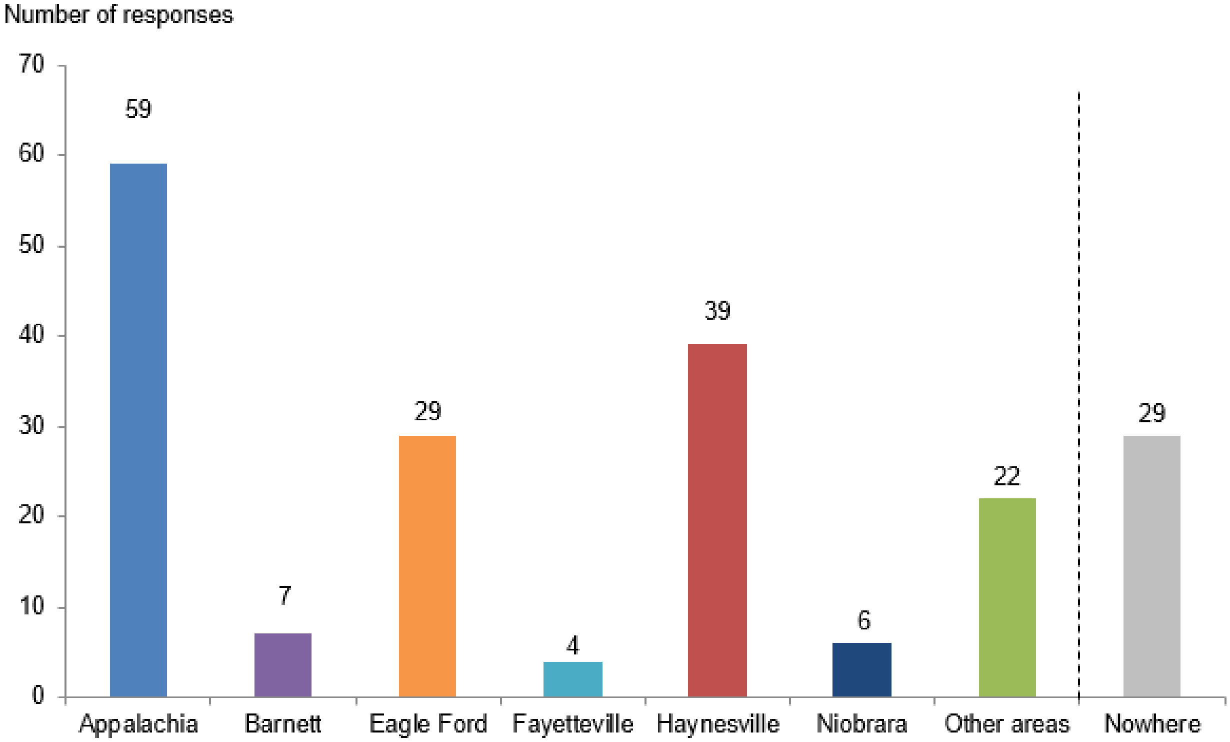
What price do you expect Henry Hub natural gas to average in 2017? Expectations centered around $3.00 per million British thermal units (MMBtu). In addition to the spot price itself, the spread between Henry Hub and Marcellus spot prices is also an important variable for many firms, especially those operating in the northeast. When asked about the spread, about 28 percent of respondents expect it to be higher in 2017 than in 2016, 51 percent expect it to be the same and 22 percent expect it to be lower.



NOTE: One hundred and five oil and gas firms answered this question from Sept. 14–22, 2016.
SOURCE: Federal Reserve Bank of Dallas.

Where do you expect U.S. drilling activity for natural gas to increase in 2017? Respondents were able to select multiple areas or choose “nowhere.” Appalachia, which includes the Marcellus and Utica, was the most common response, followed by the Haynesville. “Nowhere” was tied with the Eagle Ford for the third most frequent response, suggesting some respondents are doubtful that U.S. drilling for natural gas will increase at all next year.

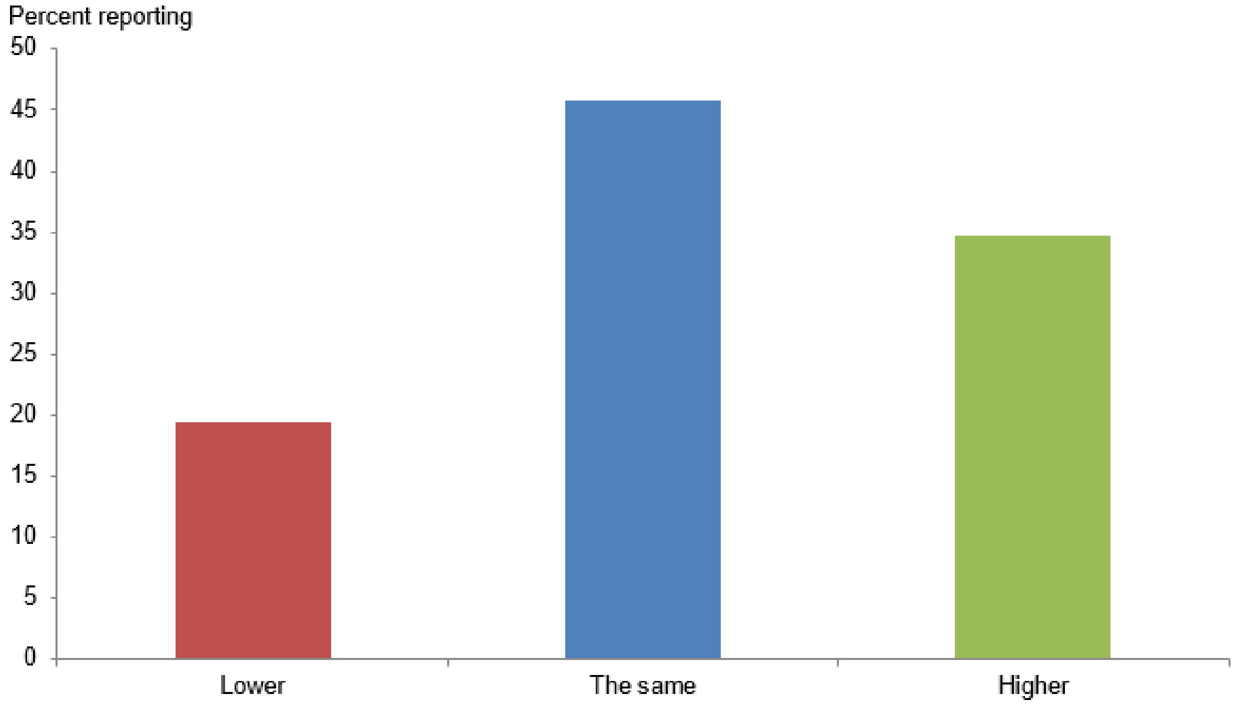
Where do you expect U.S. drilling activity for natural gas to increase in 2017?



NOTES: One hundred twenty-five oil and gas firms answered this question from Sept. 14–22, 2016. Appalachia includes the Marcellus and Utica. Respondents were able to select any number of areas.
SOURCE: Federal Reserve Bank of Dallas.

Do you expect U.S. natural gas production to be lower, the same or higher in 2017 vs. 2016? Around 20 percent of respondents expect lower production in 2017 than in 2016, 46 percent expect the same level and 35 percent expect higher production.

Do you expect U.S. natural gas production to be lower, the same or higher in 2017 vs. 2016?



NOTES: One hundred and eighteen oil and gas firms responded to this question from Sept. 14–22, 2016. Percents may not sum to 100 due to rounding.
SOURCE: Federal Reserve Bank of Dallas.

Respondents who expect U.S. gas production to rise next year were further asked which factors would play an important role in the increase. The most frequent response was completion of currently uncompleted wells.

If you expect U.S. natural gas production to be higher next year than in 2016, which factors below do you think will play an important role in the increase?

	No. of responses
Completion of currently uncompleted wells	34
Increased pipeline capacity	24
More associated gas production	23
Greater drilling productivity	22
Higher rig counts	21
Other	4

NOTES: Sixty-four oil and gas firms responded to this question from Sept. 14–22, 2016. Respondents were able to select multiple choices.
SOURCE: Federal Reserve Bank of Dallas.

Business Indicators: Quarter/Quarter

Business Indicators: All Firms Current Quarter (versus previous quarter)					
Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	26.7	13.8	44.2	38.3	17.5
Capital Expenditures	11.4	-9.3	34.7	42.0	23.3
Supplier Delivery Time	-0.7	-11.3	6.8	85.6	7.5
Employment	-6.5	-19.7	13.1	67.3	19.6
Employee Hours	-1.9	-16.5	21.1	55.9	23.0
Wages and Benefits	-9.7	-18.4	10.4	69.5	20.1
Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	19.6	19.0	41.9	35.8	22.3

Business Indicators: E&P Firms Current Quarter (versus previous quarter)					
Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	21.4	12.0	40.0	41.4	18.6
Oil Production	-10.2	-19.7	24.6	40.6	34.8
Natural Gas Wellhead Production	-20.6	-24.7	14.7	50.0	35.3
Capital Expenditures	15.1	-21.2	34.8	45.5	19.7
Expected Level of Capital Expenditures in 2017	21.8	25.4	43.5	34.8	21.7
Supplier Delivery Time	-5.9	-12.9	5.9	82.4	11.8
Employment	-13.1	-28.3	4.3	78.3	17.4
Employee Hours	-5.8	-26.9	11.8	70.6	17.6
Wages and Benefits	-12.8	-18.0	8.6	70.0	21.4
Finding and Development Costs	-20.9	-37.9	9.0	61.2	29.9
Lease Operating Expenses	-15.9	-31.3	11.6	60.9	27.5
Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	29.5	34.3	47.1	35.3	17.6

Business Indicators: O&G Support Services Firms Current Quarter (versus previous quarter)					
Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	30.9	15.3	47.6	35.7	16.7
Utilization of Equipment	24.1	-1.2	38.6	47.0	14.5
Capital Expenditures	8.3	0.0	34.5	39.3	26.2
Supplier Delivery Time	3.9	-10.0	7.7	88.5	3.8
Lag Time in Delivery of Firm’s Services	0.0	-7.5	6.2	87.7	6.2
Employment	-1.2	-13.0	20.2	58.3	21.4
Employee Hours	1.2	-8.3	28.6	44.0	27.4
Wages and Benefits	-7.1	-18.8	11.9	69.0	19.0
Input Costs	-3.6	-15.5	13.3	69.9	16.9
Prices Received for Services	-23.4	-32.1	9.9	56.8	33.3
Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	11.2	6.5	37.5	36.3	26.3

Price Expectations

Price Expectations: All Firms

Indicator	Current Index	Previous Index	% Reporting Higher	% Reporting Same	% Reporting Lower
Expected Oil Price a Year from Now	58.5	72.4	61.7	26.6	3.2
Expected Natural Gas Price a Year from Now	45.0	51.0	48.3	38.4	3.3

Price Expectations: E&P Firms

Indicator	Current Index	Previous Index	% Reporting Higher	% Reporting Same	% Reporting Lower
Expected Oil Price a Year from Now	62.8	73.1	67.1	22.9	4.3
Expected Natural Gas Price a Year from Now	36.7	60.6	42.6	45.6	5.9

Price Expectations: O&G Support Services Firms

Indicator	Current Index	Previous Index	% Reporting Higher	% Reporting Same	% Reporting Lower
Expected Oil Price a Year from Now	54.7	71.8	57.1	29.8	2.4
Expected Natural Gas Price a Year from Now	51.8	43.4	53.0	32.5	1.2

Business Indicators: Year/Year

Business Indicators: All Firms Current Quarter (versus same quarter a year ago)					
Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	-8.7	-41.4	36.2	18.8	44.9
Capital Expenditures	-12.7	-53.1	31.3	24.6	44.0
Supplier Delivery Time	-6.1	-20.0	8.4	77.1	14.5
Employment	-29.4	-42.0	11.8	47.1	41.2
Employee Hours	-23.1	-38.5	15.7	45.5	38.8
Wages and Benefits	-25.6	-37.2	10.9	52.6	36.5
Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	0.8	-17.0	39.1	22.7	38.3

Business Indicators: E&P Firms Current Quarter (versus same quarter a year ago)					
Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	-4.8	-32.3	33.3	28.6	38.1
Oil Production	-22.9	-36.0	24.6	27.9	47.5
Natural Gas Wellhead Production	-18.0	-30.6	21.3	39.3	39.3
Capital Expenditures	-6.7	-55.5	33.3	26.7	40.0
Expected Level of Capital Expenditures in 2017	3.3	-19.0	36.1	31.1	32.8
Supplier Delivery Time	-6.7	-18.4	8.3	76.7	15.0
Employment	-30.6	-35.4	8.1	53.2	38.7
Employee Hours	-19.3	-25.0	11.3	58.1	30.6
Wages and Benefits	-12.7	-30.8	12.7	61.9	25.4
Finding and Development Costs	-45.0	-57.8	5.0	45.0	50.0
Lease Operating Expenses	-39.4	-53.1	9.8	41.0	49.2
Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	17.0	-3.2	47.5	22.0	30.5

Business Indicators: O&G Support Services Firms Current Quarter (versus same quarter a year ago)					
Indicator	Current Index	Previous Index	% Reporting Increase	% Reporting No Change	% Reporting Decrease
Level of Business Activity	-12.0	-48.7	38.7	10.7	50.7
Utilization of Equipment	-17.8	-56.4	30.1	21.9	47.9
Capital Expenditures	-17.6	-51.2	29.7	23.0	47.3
Supplier Delivery Time	-5.6	-21.4	8.5	77.5	14.1
Lag Time in Delivery of Firm’s Services	-7.0	-18.7	8.3	76.4	15.3
Employment	-28.3	-47.5	14.9	41.9	43.2
Employee Hours	-26.4	-49.4	19.4	34.7	45.8
Wages and Benefits	-36.4	-42.5	9.5	44.6	45.9
Input Costs	-20.5	-47.4	13.7	52.1	34.2
Prices Received for Services	-43.6	-56.6	11.3	33.8	54.9
Indicator	Current Index	Previous Index	% Reporting Improved	% Reporting No Change	% Reporting Worsened
Company Outlook	-13.0	-28.4	31.9	23.2	44.9

These comments are from respondents' completed surveys and have been edited for publication. Comments from the Special Questions survey can be found below.

Exploration and Production Firms

- The lack of precision in global information as to supply and demand plagues us all. Anecdotal evidence of economic conditions move markets irrationally. Knowledge, or more accurately, lack of knowledge, of when oil will rebalance is palpable. There is paralysis from analysis that prevents rational deployment of capital.

  There are too many dollars chasing deals. Private equity-backed companies will overpay for the opportunity to participate. More dollar flow into energy will cause an ever-increasing level of activity. Ever-increasing activity will cause increases in technology and, consequently production. Increases in production will hold energy prices down.
- Activity for conventional oil and gas remains sluggish. Activity has picked up in the Delaware Basin of West Texas.
- We continue to see operating costs and drilling costs fall dramatically. This is good when oil prices are low. On the other side, we are seeing much better drilling and completion techniques so wells produce more oil, which makes them economical to drill even at low oil prices. As such, we are shooting ourselves in the foot as we continue to increase output/supply, which is what I believe is keeping prices down—too much oil on the market. It is now supply and demand without the shocks or world events as in decades past.
- Expectation of a rising natural gas price is encouraging us to do more natural gas projects. We are not seeing a rise in service company costs to date.
- I believe that natural gas prices have reached an equilibrium where the replacement costs equal the forward sales price as reflected in the futures market.
- I do not believe that the world can sustain its current 97 million barrels per day oil production level at the current price, but that the glut will continue for another 12 months until that balance is reached. I believe that the equilibrium price for oil, long term, is $65-75 per barrel.
- If we don't get relief from Environmental Protection Agency regulations and they enforce them, we will be out of business.
- The market is now reacting quickly to price changes. We will be rangebound for a while, if not 10-20 percent lower.
- The new fee regulatory structure imposed by the Louisiana legislature and carried out by Louisiana Department of Natural Resources and Department of Environmental Quality is burdensome.
- Oil and gas production continues to outpace consumption to the point that I do not see any possibility of price increases soon.
- The time frame for increased prices continues to be pushed further out. Unless prices rebound, any company with any debt is going to be in trouble.
- We drill conventional oil wells. We remain very active. We are currently drilling the third well of a planned eight well program.

Oil and Gas Support Services Firms

- Banks are putting pressure on us and business partners, and rates on lines of credit are up. Regulatory issues continue to increase especially in light of earthquakes in Oklahoma. Demand for consulting services is collapsing. Solvency of oil and gas operator partners is now a stressor. Bank lines that used to be available are being withdrawn. Access to capital is horrible. Banks are raising fees on everything. We will probably have to start bringing our own pens to the bank. The price of Oklahoma Sweet Crude collapsed in August checks to $15.25 per barrel.
- Overall activity is up but our pricing power remains at zero. Other headwinds exist as well, such as a shortage of knowledgeable, experienced employees. In addition, the uptick in activity is too slow to save most companies with leverage from having to restructure to heal their balance sheets.

  Capital markets are essentially closed to all oil field service companies. So we are not out of the woods by any measure.
- Capital expenditures money has gone away, the banks are running scared from regulator pressures, money is tight and business is gloomy, as far as future growth. To expand this business, we need capital.

  Our phone keeps ringing, but we have no capital expenditure money to grow, and we will have to sit on our hands until things get better.

- Service capacity in the oil and gas space will become a major issue for upstream producers. Service cost inflation will have to happen, but it will also serve to help support price increases as service capacity will be unable to keep pace with demand increases. Thus, the U.S. will be unable to serve as the swing supplier to mitigate a price increase.
- Oversupply of oil and record high storage volumes of oil continue to create problems for the oil industry. Natural gas production volumes and undrilled locations are high enough to continue low prices for natural gas. We will be lucky to see oil hold in the mid $40s per barrel. Globally, Iran will continue to be a problem for the Organization of the Petroleum Exporting Countries (OPEC), and the odds of OPEC curtailing production are dismal.

  The time is right for the U.S. to become completely self-sufficient in energy. That would take political courage we probably cannot muster, but we could get there.
- Competition is fierce for the scant amount of work out there. It is unfortunate that my company has to compete with foreign companies who don't have the same restrictions as domestic companies internationally.
- Confidence in price per barrel stability remains lacking.
- Continued price weakness has dimmed the outlook for the future, as this downturn appears to be more persistent than anticipated—two years and counting with no end in sight. Future prospects look very bleak. My plan is to continue drawing down cash reserves while attempting to increase production and reduce costs where possible, although at this point there is not much room for cost reduction without cutting back on payroll. Our business plan does not include debt. The only active companies are now using their access to capital to subsidize activity levels. This is continuing to prop up rig counts despite market signals to cut back, and thus delaying the anticipated natural decline in production. The end result is an artificial elongation of this down cycle by continuing to push new oil into a glutted market.
- Even though oil prices have taken a short-term drop, overall we are excited about the activity increase in the coming quarter. We believe that prices are going to stabilize and overall costs will assist in more profitable ventures.
- Regulations are costing jobs because of compliance costs. The small producer has no chance of being in compliance with all local, state and federal regulations. Environmental groups and government bodies are attempting to eliminate all hydrocarbon production (coal, oil and natural gas). If hydraulic fracturing is banned, within two years of the same, the trade deficit will be at an all-time high and our national security at an all-time low.
- There seems to be a little more talk about work as well as acquisitions, but I see no increase in my services at this time. The outlook has improved a little.
- The oilfield services sector, especially wireline services, is still oversupplied.
- The sale of natural gas to export from South Texas has increased our production in fracking with water sales and water-based mud.
- We see improvement in activity, but the near-term outlook is cautious ahead of typical seasonal declines in activity.
- With the election I foresee no price increase at this time.

Special Questions Comments

Exploration and Production Firms

- Pricing is still being driven by oversupply. The only bright spot may be increased exports of liquefied natural gas, but the continuing glut of hydrocarbons worldwide will keep a lid on gas prices.
- The Apache find in West Texas could bring about a significant increase in production over the next two to four years as the field is developed.
- My business is Texas based and will benefit from increasing pipeline capacity to Mexico for natural gas.
- Not every shale play is the same in cost versus profit. One cannot be general in what price drives drilling and production. It also matters who owns sweet spots. Price sensitivity is different in both regions and shale itself.
- I expect gas production will be lower in 2017.

Oil and Gas Support Services Firms

- So many companies have depleted their ranks of older, knowledgeable workers that when this finally turns around, the number of mistakes the "newbie" replacements will make will be horrifying and will increase workplace deaths markedly, the closer you get to the rigs, pipelines, plants, etc., in the "fields". Across the board, new college grads have hollow grades—they look good but benefited from grade inflation, and they're actually undereducated by and large compared with my generation. Their work ethic, by and large, is poor, and their salary demands are extreme.
- Marcellus and Utica production could easily be side-railed by environmental objections. Eagle Ford production could be crimped because of water concerns. There is a determined effort by this administration (and environmental "click to donate" groups) to stop all drilling on onshore public lands. Public lands are reported to comprise 640 million acres. Because these lands are unable to be taxed by the citizens in the communities, towns, cities, counties and states, the fortunate ones that have oil and gas within their districts depend on oil and gas revenues "shared" by the federal government.
- The supply of natural gas will increase in the Permian Basin of West Texas before other areas.
- Natural gas production companies are taking advantage of lower prices in trucking in the oilfield industry. Since oil is lower in price and all rigs and production are being utilized, the gas industry is taking advantage of the situation as gas prices remain the same or are even higher. Therefore, in the (vacuum) trucking industry the rate is less than other years.

Questions regarding the Dallas Fed Energy Survey can be addressed to Michael Plante at Michael.Plante@dal.frb.org.

The Dallas Fed Energy Survey can be found online at www.dallasfed.org/microsites/research/surveys/des/.
