Natural Gas Production Report

Q3

July to September 2020

This report uses data reported to the Pennsylvania Department of Environmental Protection (DEP) by natural gas operators to develop statewide tabulations of production volume and well counts. These data are presented on a quarterly basis to show recent trends in natural gas activity in the Commonwealth. Production and well count data pertain only to gas produced from unconventional sources (e.g., shale). The production and well count data throughout this report focus on horizontal wells, which comprise over 99 percent of unconventional production in Pennsylvania. The report also provides (1) state production comparisons from the U.S. Energy Information Administration (EIA) and (2) recent regional price trends from Bentek Energy.

Production Volume and New Wells Spud

Recent data from DEP show that natural gas production volume from horizontal wells was 1,751 billion cubic feet (bcf) in the third quarter of 2020 (see **Table 1**). This output represents an increase of 2.0 percent from the third quarter of 2019, the lowest such growth rate on record. Year-over-year production growth has decelerated over the last five quarters after very strong gains from the first quarter of 2018 to the second quarter of 2019. Furthermore, total production in September declined by 1.3 percent from September 2019, the first year-over-year decline in monthly production since February 2017.

There were 111 new horizontal wells spud in the third quarter of 2020. This figure represents a decrease of 24 wells (-17.8 percent) from the same period in the prior year, and the sixth consecutive quarter in which there was a year-over-year decline in new wells spud. The figure also represents the lowest number of new wells spud in a quarter since the second quarter of 2016.

Table 1: Production Volume and New Wells Spud

	2019			2020		
	Q2	Q3	Q4	Q1	Q2	Q3
Production	1,670	1,716	1,774	1,766	1,717	1,751
Growth Rate	14.6%	9.4%	7.6%	6.8%	2.9%	2.0%
New Wells Spud	164	135	117	153	113	111
Growth Rate	-22.6%	-21.1%	-41.2%	-22.7%	-31.1%	-17.8%

Note: Growth rates are year-over-year. Production in billion cubic feet. All data exclude vertical wells, which account for less than one percent of production.

Figure 1 displays the year-over-year growth rates of horizontal well production over the last 16 quarters. After reaching the highest level on record in late 2018, annual growth in quarterly production decelerated for eight consecutive quarters. The previous record-low for annual growth in quarterly production was 2.3 percent in the first quarter of 2017. The growth rate for the third quarter of 2020 now represents the lowest rate on record.

Figure 1 - Production Growth

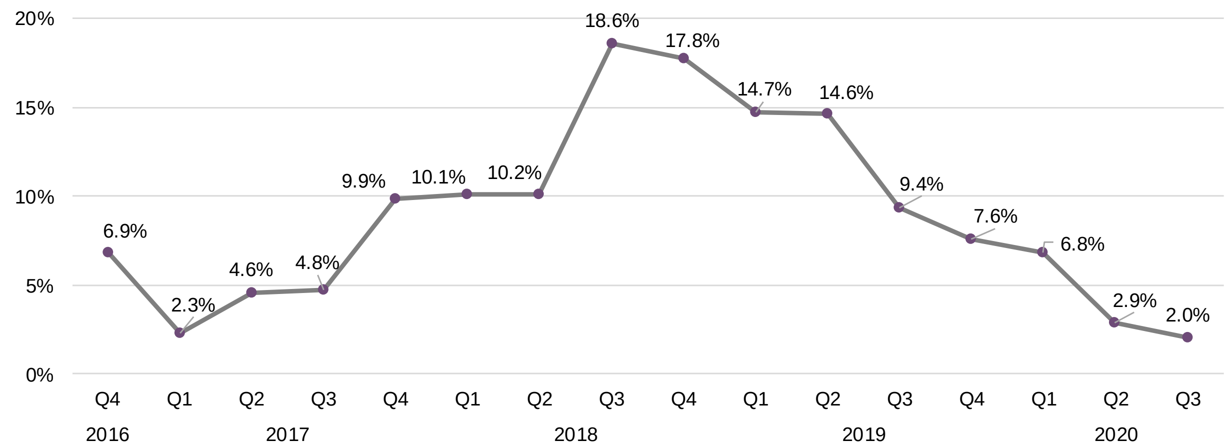
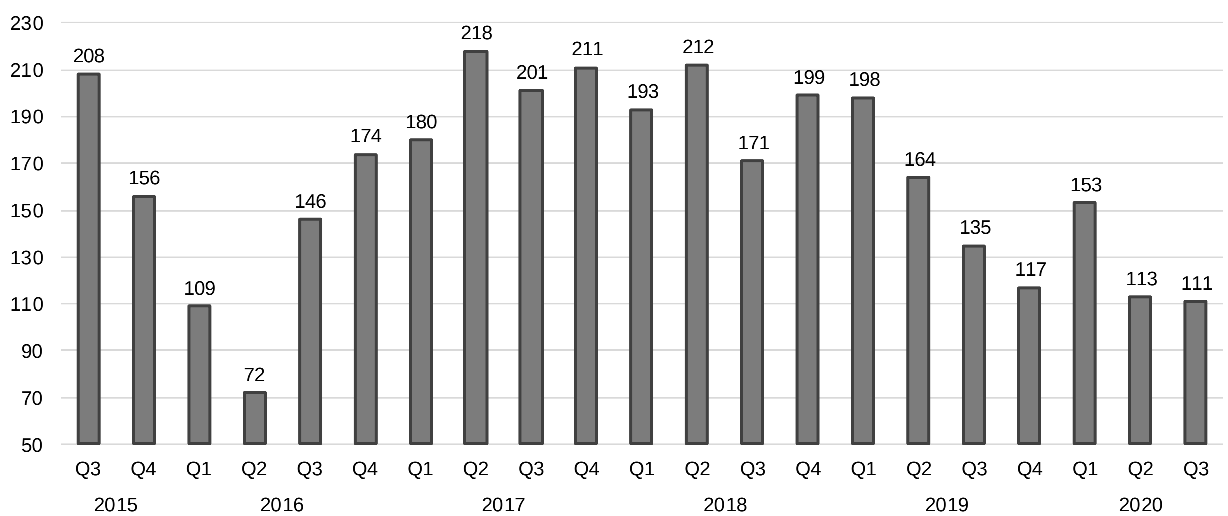


Figure 2 shows the quarterly number of new horizontal wells spud since the third quarter of 2015. The number of wells spud in the third quarter of 2020 was the lowest third quarter spud count since 2016. The spud count for the first three quarters of 2020 represents a decline of 120 wells (-24.1 percent) from the first three quarters of 2019. Preliminary data for the fourth quarter show that the number of wells spud in October and November increased by roughly 24 percent from same period in the prior year.

Figure 2 - New Horizontal Wells Spud



Well Count Trends

Table 2 displays the number of producing wells over the last six quarters. There were 10,162 total producing wells in the third quarter of 2020, an increase of 5.9 percent from the prior year. Horizontal producing wells, which account for over 99 percent of production, increased by 6.3 percent from the prior year. This is the smallest year-over-year increase in quarterly horizontal producing wells on record. Decelerating growth in producing wells is the result of less drilling activity and older wells being shut in or plugged.

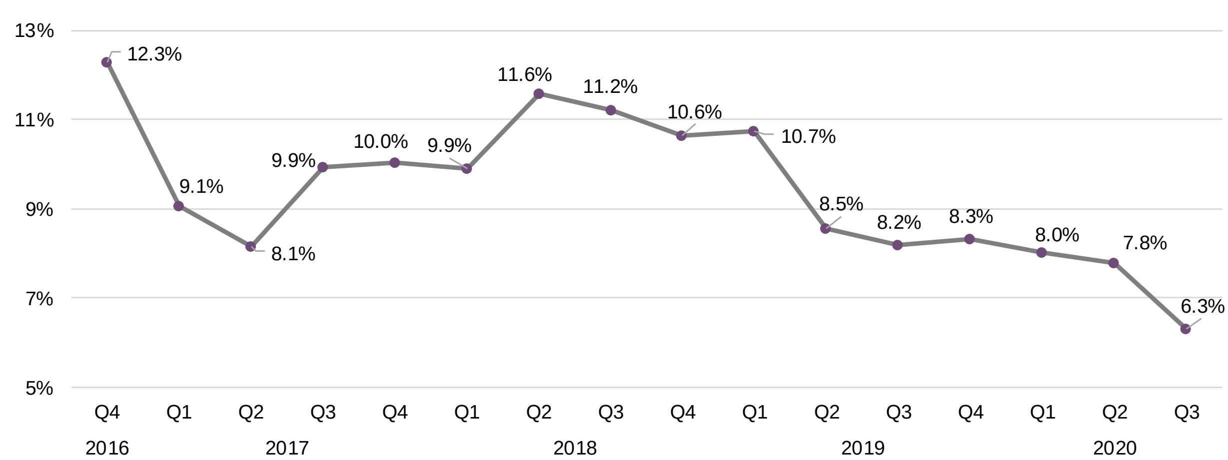
Table 2: Quarterly Producing Well Count

	2019			2020		
	Q2	Q3	Q4	Q1	Q2	Q3
Horizontal	8,897	9,121	9,321	9,470	9,588	9,697
Growth Rate	8.5%	8.2%	8.3%	8.0%	7.8%	6.3%
Total	9,379	9,600	9,789	9,945	10,064	10,162
Growth Rate	8.1%	7.6%	7.7%	7.6%	7.3%	5.9%

Note: Growth rates are year-over-year. Vertical wells are not shown separately, as they account for less than one percent of production.

Figure 3 shows the year-over-year growth in the number of horizontal producing wells over the last 16 quarters. Recent growth in producing wells dropped below rates from early 2017, when quarterly production growth was at its lowest level on record. Without a significant uptick in new wells spud, producing well growth will likely continue to decelerate.

Figure 3 - Producing Well Growth



County and State Comparison

Table 3 shows county-level production volume and producing well counts through the third quarter for 2019 and 2020. Ranked in order of production, the table shows (1) the top five counties, (2) the next five counties combined into one group and (3) the remaining counties as another group. The top five counties accounted for 74.4 percent of production and 68.4 percent of producing wells statewide. The top producing county, Susquehanna, recorded a year-over-year decline in year-to-date production. Bradford, Greene and Lycoming Counties accounted for nearly 60 percent of statewide production growth over the prior year. Other counties recording significant year-to-date production growth include Allegheny (26.6 percent) and Wyoming (10.7 percent).

Table 3: County Production Comparison

		Production Volume				Producing Wells			
		Year-to-date		2020 Metrics		Year-to-date		2020 Metrics	
Rank	County	2019	2020	Share	Growth	2019	2020	Share	Growth
1	Susquehanna	1,245	1,224	23.4%	-1.7%	1,458	1,578	16.3%	8.2%
2	Washington	876	880	16.8%	0.5%	1,579	1,683	17.4%	6.6%
3	Greene	749	764	14.6%	2.1%	1,093	1,159	12.0%	6.0%
4	Bradford	659	694	13.3%	5.3%	1,255	1,312	13.6%	4.5%
5	Lycoming	273	333	6.4%	22.0%	830	875	9.1%	5.4%
6-10	Next 5 Counties	872	930	17.8%	6.7%	1,698	1,800	18.6%	6.0%
	All Other	365	408	7.8%	11.7%	1,338	1,436	14.9%	7.3%

Note: Data through the third quarter. Horizontal wells only. Production in billion cubic feet. Next 5 Counties includes Tioga, Wyoming, Butler, Allegheny and Sullivan Counties.

Table 4 provides a state comparison of gross natural gas production from all well types. Ranked in order of production, the table shows (1) the top five states, (2) the next five states combined into one group and (3) the remaining states combined into one group. Through August 2020, all states in the top five, except for Alaska, recorded a deceleration in production growth or a decline in production volume compared to 2019.

Table 4: State Production Comparison

		Production Volume			Annual Growth Rate		
Rank	State	CY 2018	CY 2019	CY 2020	CY 2018	CY 2019	CY 2020
1	Texas	8,814	10,355	6,933	10.2%	17.5%	2.4%
2	Pennsylvania	6,207	6,897	4,816	13.6%	11.1%	6.3%
3	Alaska	3,255	3,250	2,248	0.1%	-0.1%	4.5%
4	Oklahoma	2,946	3,175	1,892	17.2%	7.8%	-9.8%
5	Louisiana	2,830	3,230	2,125	31.8%	14.2%	0.0%
6-10	Next 5 States	9,260	10,204	6,930	13.0%	10.2%	4.7%
	All Other	3,697	3,781	2,233	-2.6%	2.3%	-11.1%

Source: U.S. Energy Information Administration. Production does not directly correspond to DEP data. CY 2020 production and growth rate is through August. Includes all production sources and well types. Production in billion cubic feet. Next 5 States includes Ohio, Colorado, West Virginia, Wyoming and New Mexico.

Price Trends

Table 5 displays recent trends in natural gas spot prices at the Henry Hub and two major Pennsylvania hubs. These data show that both prices have been declining dramatically over the last four quarters. From the second quarter of 2019 to the third quarter of 2020, the Pennsylvania average price declined by 42.4 percent. This significant decline in prices is the result of sustained production growth (supply), from already record levels, outstripping demand.

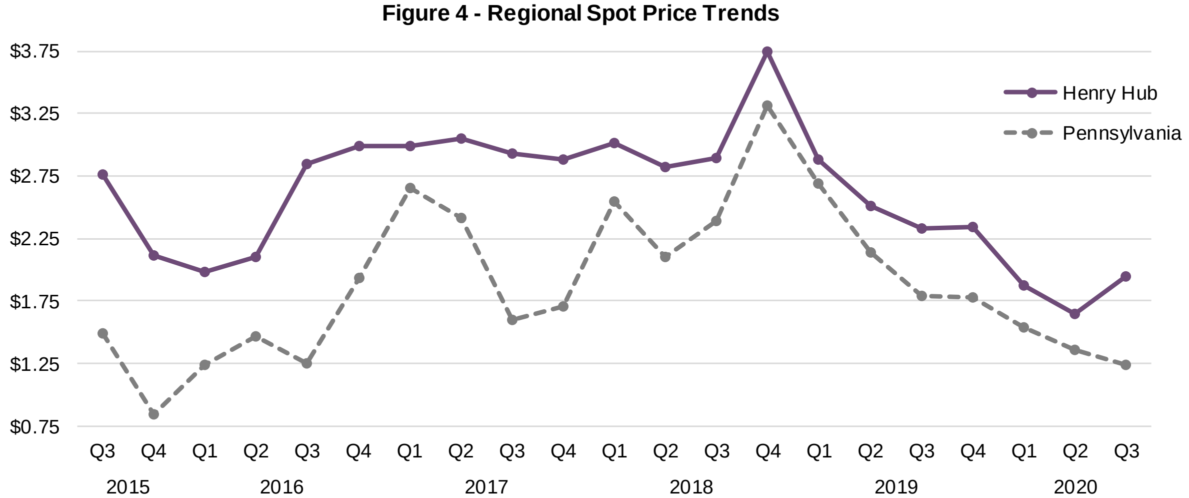
Table 5: Regional Spot Price Trends

	2019			2020		
	Q2	Q3	Q4	Q1	Q2	Q3
Henry Hub	$2.51	$2.33	$2.34	$1.88	$1.64	$1.95
Growth Rate	-10.9%	-19.6%	-37.5%	-34.9%	-34.5%	-16.4%
PA Average	$2.14	$1.80	$1.78	$1.54	$1.36	$1.23
Growth Rate	1.9%	-24.7%	-46.5%	-42.9%	-36.6%	-31.3%

Source: Bentek Energy. The PA Average is a weighted average of the Dominion South and Transco Leidy trading hubs. The Henry Hub is located in Louisiana. Growth rates are year-over-year.

Figure 4 displays trends in the same prices over the last 20 quarters. The figure shows the precipitous decline in both national and regional prices since late 2018. Prior to 2020, both prices were declining due to oversupply, as growing production outpaced record levels of demand for natural gas. For 2020, the EIA projects that national demand for natural gas will decline for the first time since 2009, largely due to mild weather in early 2020, which reduced demand for heating.

Figure 4 - Regional Spot Price Trends



Staff Acknowledgements

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