Natural Gas Production Report

Q1

January to March 2021

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% 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 1,863 billion cubic feet (bcf) in the first quarter of 2021 (see **Table 1**). This output represents an increase of 5.4% from the first quarter of 2020, a clear acceleration after several quarters of moderate growth.

There were 133 new horizontal wells spud in the first quarter of 2021. This figure represents a decrease of 20 wells (-13.1%) from the same period in the prior year. Wells spud in the first quarter represent the first quarter-to-quarter increase in drilling since the first quarter of 2020, as drilling slowed notably in the spring of last year due to record-low prices and the COVID-19 pandemic.

Table 1: Production Volume and New Wells Spud

	2019	2020				2021
	Q4	Q1	Q2	Q3	Q4	Q1
Production	1,774	1,767	1,718	1,765	1,827	1,863
Growth Rate	7.6%	6.8%	2.9%	2.9%	3.0%	5.4%
New Wells Spud	117	153	113	111	99	133
Growth Rate	-41.2%	-22.7%	-31.1%	-17.8%	-15.4%	-13.1%

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, quarterly production growth decelerated for eight consecutive quarters before plateauing in the third and fourth quarters of 2020. Year-over-year growth picked up slightly in the first quarter of 2021, although still the lowest first quarter growth recorded since 2017.

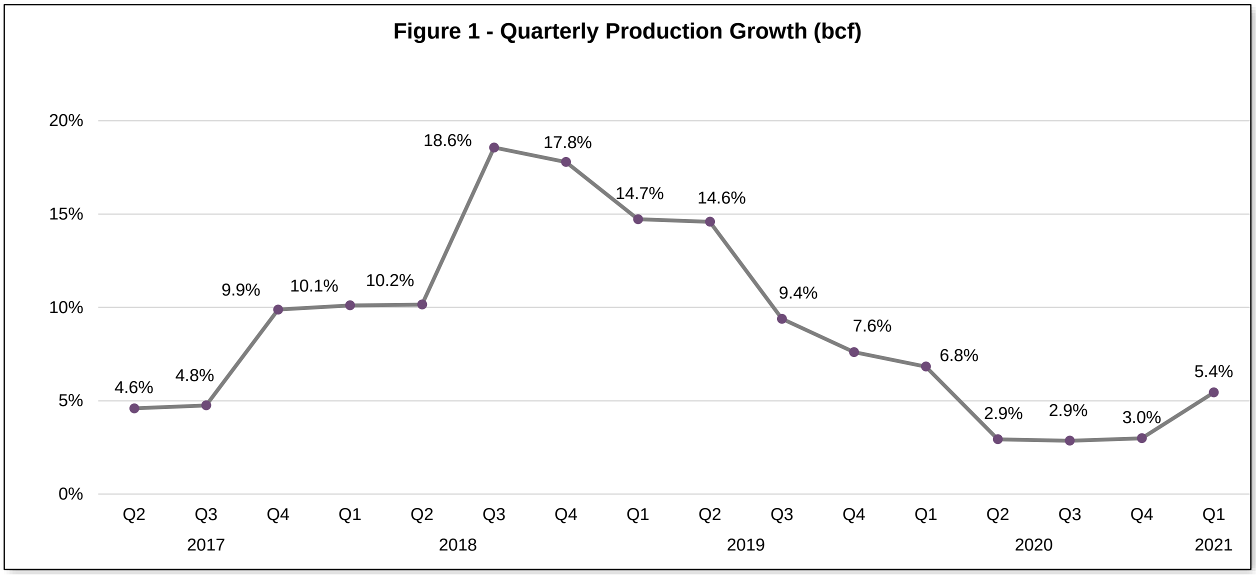
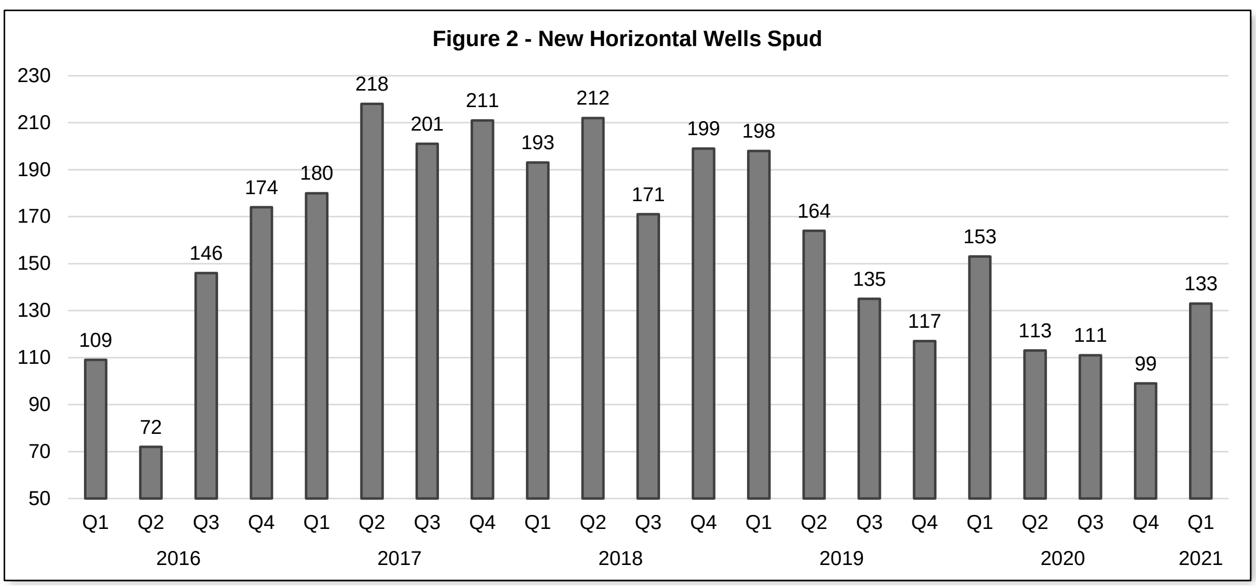


Figure 2 shows the quarterly number of new horizontal wells spud since the first quarter of 2016. The number of wells spud in the first quarter of 2021 represented an uptick from the three prior quarters, although it is still 20 wells (-13.1%) lower than the same period in 2020. Preliminary second quarter data show that wells spud in April and May are up 9.9% from the same period in 2020.



Well Count Trends

Table 2 displays the number of producing wells over the last six quarters. There were 10,438 total producing wells in the first quarter of 2021, an increase of 4.9% from the prior year. Horizontal producing wells, which account for over 99% of production, recorded an annual increase of 5.3%. This growth rate is the smallest year-over-year increase in quarterly horizontal producing wells on record. Decelerating growth in producing wells is due to less drilling activity and older wells being shut in or plugged.

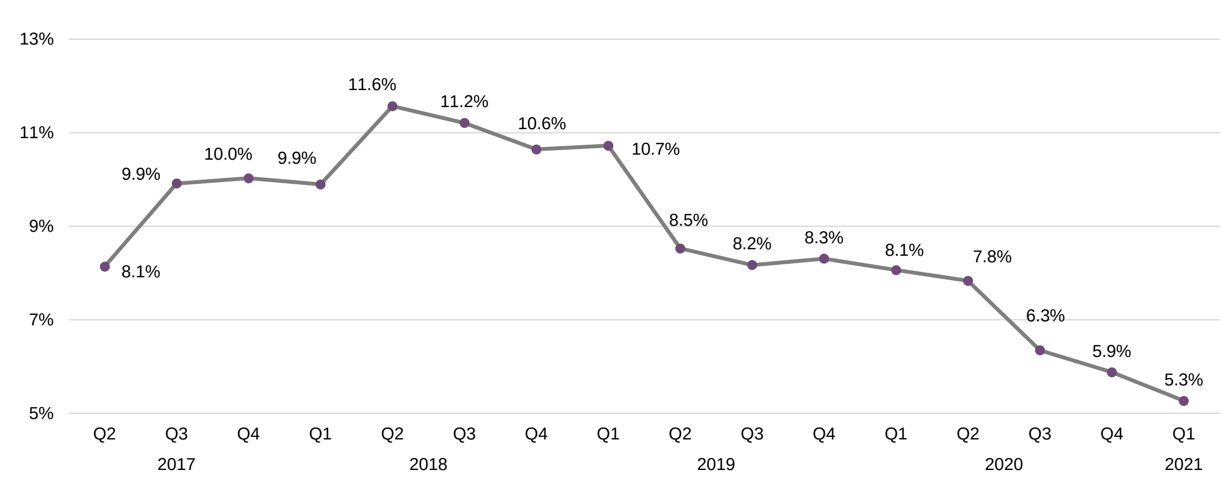
Table 2: Quarterly Producing Well Count

	2019	2020				2021
	Q4	Q1	Q2	Q3	Q4	Q1
Horizontal	9,321	9,473	9,593	9,700	9,869	9,972
Growth Rate	8.3%	8.1%	7.8%	6.3%	5.9%	5.3%
Total	9,789	9,950	10,069	10,168	10,332	10,438
Growth Rate	7.7%	7.6%	7.4%	5.9%	5.5%	4.9%

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 to its lowest level on record. Without a significant uptick in new wells spud, producing well growth will likely continue to decelerate or stagnate.

Figure 3 - Year-Over-Year Growth in Producing Well Counts by Quarter



County and State Comparison

Table 3 shows county-level production volume and producing wells for first quarter of 2020 and 2021. 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 75.6% of production and 67.3% of producing wells statewide. The top producing county, Susquehanna, recorded a year-over-year decline in production. The combined growth in Washington and Bradford counties represented nearly 93% of the statewide increase, as most other counties either recorded a modest increase or a decline in quarterly production.

Table 3: County Production Comparison

		Production Volume				Producing Wells			
		First Quarter		2021 Metrics		First Quarter		2021 Metrics	
Rank	County	2020	2021	Share	Growth	2020	2021	Share	Growth
1	Susquehanna	404	401	21.5%	-0.8%	1,500	1,607	16.1%	7.1%
2	Washington	289	328	17.6%	13.8%	1,598	1,712	17.2%	7.1%
3	Greene	284	284	15.3%	0.2%	1,129	1,163	11.7%	3.0%
4	Bradford	222	272	14.6%	22.3%	1,276	1,340	13.4%	5.0%
5	Lycoming	105	123	6.6%	17.1%	853	892	8.9%	4.6%
6-10	Next 5 Counties	317	311	16.7%	-2.1%	1,730	1,799	18.0%	4.0%
	All Other	145	143	7.7%	-1.3%	1,387	1,459	14.6%	5.2%

Note: 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. In CY 2020, Pennsylvania recorded the strongest year-over-year growth of top-producing states. Pennsylvania's share of nationwide production was 17.9%, an increase of one percentage point from CY 2019 and its largest share on record.

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	9,109	10,355	10,291	12.7%	13.7%	-0.6%
2	Pennsylvania	6,265	6,897	7,290	14.9%	10.1%	5.7%
3	Alaska	3,255	3,250	3,429	0.1%	-0.1%	5.5%
4	Louisiana	2,840	3,230	3,189	32.2%	13.7%	-1.3%
5	Oklahoma	2,876	3,175	2,786	14.4%	10.4%	-12.2%
6-10	Next 5 States	9,290	10,204	10,439	15.3%	9.8%	2.3%
	All Other	3,691	3,781	3,265	-2.6%	2.4%	-13.6%

Source: U.S. Energy Information Administration. Production does not directly correspond to DEP data. 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 after several quarters of decline, both prices recorded significant annual growth in the first quarter of 2021. The Henry Hub price recorded an increase of 83.4% over the prior year, while the Pennsylvania average price increased by 64.4%. This growth was largely driven by prices in the month of February, due to nationwide freezing temperatures, most notably in Texas. The average Henry Hub price in February was $5.14, while the average price for Pennsylvania was $3.29.

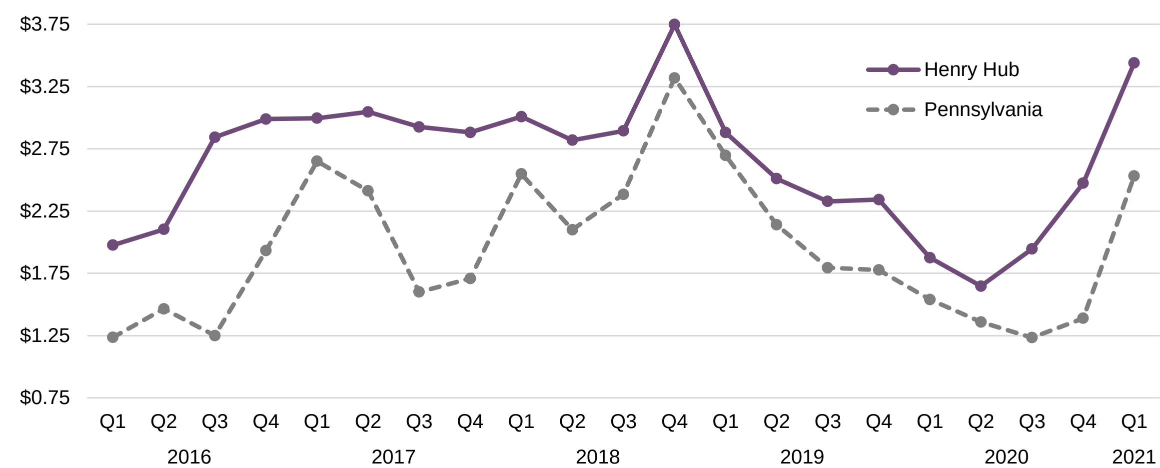
Table 5: Regional Spot Price Trends

	2019	2020				2021
	Q4	Q1	Q2	Q3	Q4	Q1
Henry Hub	$2.34	$1.88	$1.65	$1.95	$2.47	$3.44
Growth Rate	-37.5%	-34.9%	-34.4%	-16.4%	5.6%	83.4%
PA Average	$1.78	$1.54	$1.36	$1.23	$1.39	$2.53
Growth Rate	-46.5%	-42.9%	-36.5%	-31.3%	-21.8%	64.4%

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

Figure 4 displays trends in the same prices over the last 21 quarters. The figure shows the precipitous decline in both national and regional prices from late 2018 to mid-2020. Since then, both prices increased due to strong energy demand during the winter months, and the Texas freeze in February.

Figure 4 - Regional Spot Price Trends ($/MMBtu)



Staff Acknowledgements

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