

# Natural Gas Production Report



## July to September 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 1,884 billion cubic feet (bcf) in the third quarter of 2021 (see **Table 1**). This output represents an increase of 6.8% from the third quarter of 2020. The third quarter growth was largely driven by September production, which grew by 11.3% from September 2020. This is the strongest year-over-year growth for a month of production since July 2019. Production through September was 6.7% higher than the same period in 2020, nearly double the growth rate of 2020 full-year production.

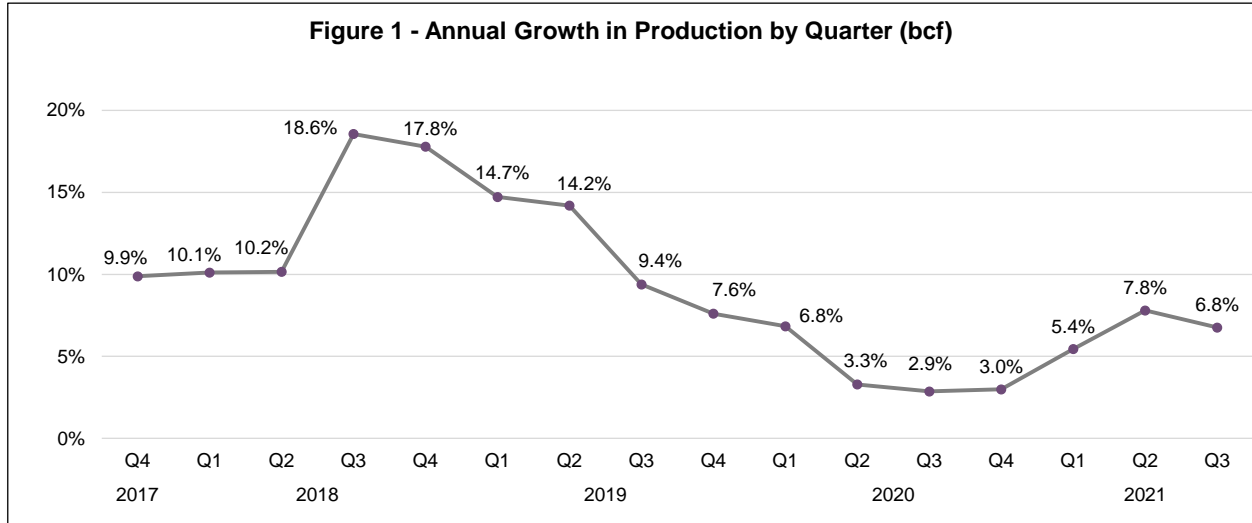
There were 111 new horizontal wells spud in the third quarter of 2021. This figure represents no change from the same period in the prior year, and the second-lowest number of wells spud in a quarter in the last five years. New wells spud has declined quarter-to-quarter throughout 2021.

**Table 1: Production Volume and New Wells Spud**

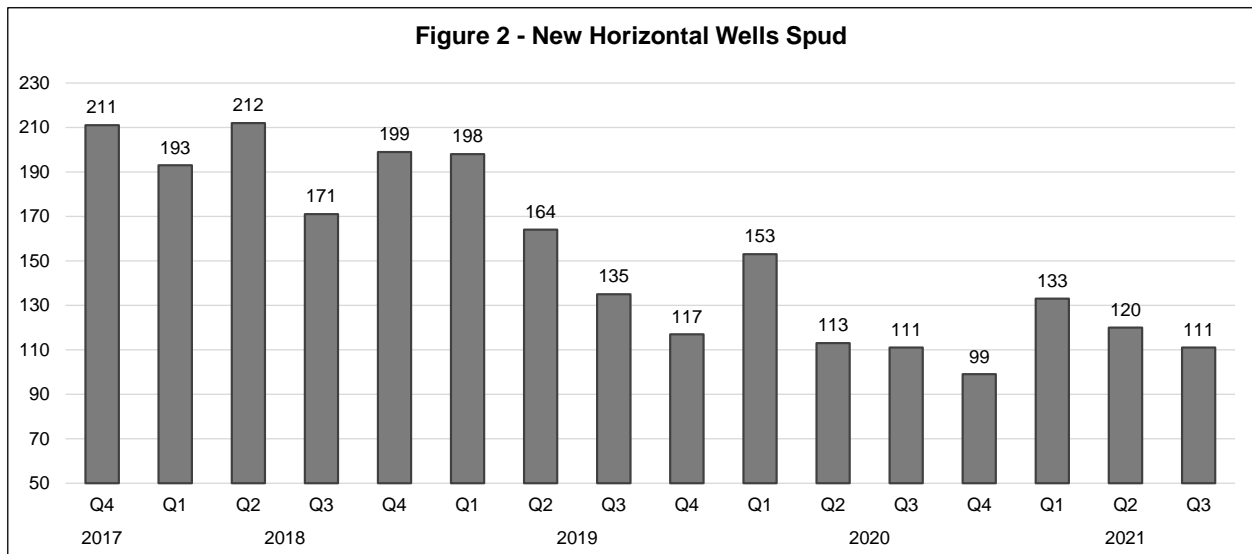
	2020			2021		
	Q2	Q3	Q4	Q1	Q2	Q3
Production	1,718	1,765	1,827	1,863	1,852	1,884
Growth Rate	3.3%	2.9%	3.0%	5.4%	7.8%	6.8%
New Wells Spud	113	111	99	133	120	111
Growth Rate	-31.1%	-17.8%	-15.4%	-13.1%	6.2%	0.0%

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. Annual growth in quarterly production fell to the lowest rate on record in the second quarter of 2020 and stagnated through the remainder of the year. Through three quarters of 2021, production growth has resembled the rates from just prior to the pandemic.



**Figure 2** shows the quarterly number of new horizontal wells spud over the last 16 quarters. After a notable quarter-to-quarter uptick in 2021 Q1, new wells spud in the second and third quarters reverted to a level similar to the spring and fall of 2020. Preliminary fourth quarter data show that wells spud in October and November are up 70% from the same period in 2020.



## Well Count Trends

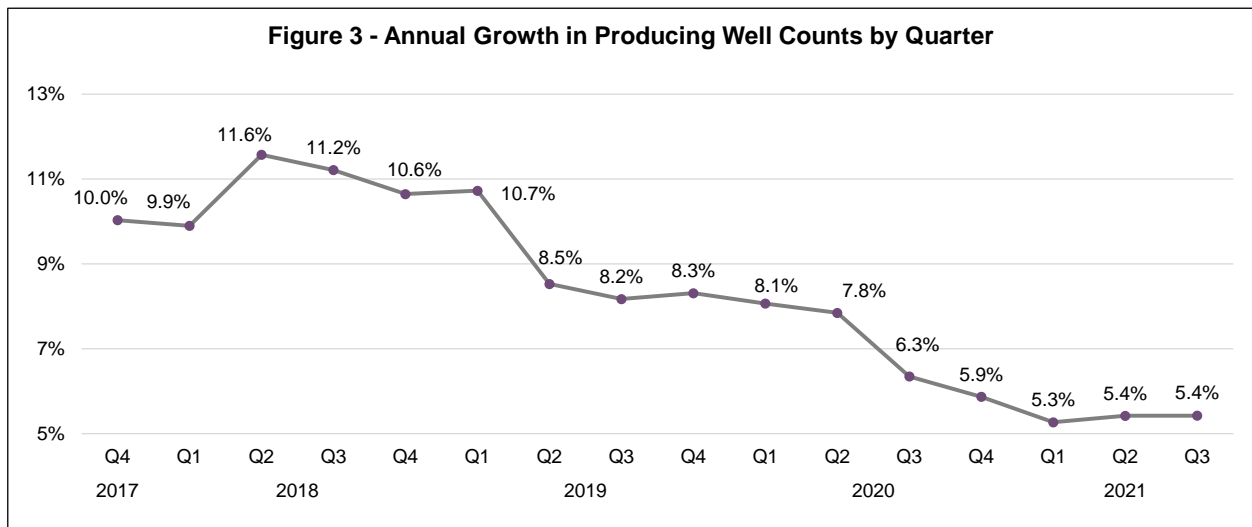
**Table 2** displays the number of producing wells over the last six quarters. There were 10,665 total producing wells in the third quarter of 2021, an increase of 4.9% from the prior year. Horizontal producing wells, which account for over 99% of production, recorded an annual increase of 5.4%. Decelerating growth in producing wells is due to less drilling activity and older wells being shut in or plugged.

**Table 2: Quarterly Producing Well Count**

	2020			2021		
	Q2	Q3	Q4	Q1	Q2	Q3
Horizontal	9,594	9,700	9,868	9,972	10,114	10,226
Growth Rate	7.8%	6.3%	5.9%	5.3%	5.4%	5.4%
Total	10,073	10,168	10,333	10,438	10,569	10,665
Growth Rate	7.4%	5.9%	5.6%	4.9%	4.9%	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 rate on record. Without a significant uptick in new wells spud, producing well growth will likely continue to decelerate or stagnate.



## County and State Comparison

**Table 3** shows county-level production volume and producing wells through the third 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 75.7% of production and 67.5% of producing wells statewide. The top producing county, Susquehanna, recorded a year-over-year decline in production. The combined growth in Washington, Bradford, Lycoming and Wyoming counties represented over 100% of the statewide increase, as most other counties recorded only a modest increase or a decline in quarterly production.

**Table 3: County Production Comparison**

Rank	County	Production Volume				Producing Wells			
		Year-to-date		2021 Metrics		Year-to-date		2021 Metrics	
		2020	2021	Share	Growth	2020	2021	Share	Growth
1	Susquehanna	1,224	1,197	21.4%	-2.3%	1,578	1,681	16.2%	6.5%
2	Washington	880	1,029	18.4%	16.9%	1,683	1,794	17.3%	6.6%
3	Bradford	694	846	14.3%	21.9%	1,312	1,395	11.7%	6.3%
4	Greene	764	803	15.1%	5.1%	1,159	1,209	13.5%	4.3%
5	Lycoming	333	365	6.5%	9.7%	875	917	8.8%	4.8%
6-10	Next 5 Counties	944	932	16.6%	-1.3%	1,800	1,868	18.0%	3.8%
	All Other	409	427	7.6%	4.3%	1,436	1,500	14.5%	4.5%

Note: Horizontal wells only. Production in billion cubic feet. Next 5 Counties includes Wyoming, Tioga, 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 2021, Pennsylvania production recorded the strongest year-over-year growth of any top-five state. Pennsylvania production also comprised 18.7% of nationwide production through August, which would be the state's highest recorded share for a full year.

**Table 4: State Production Comparison**

Rank	State	Production Volume			Annual Growth Rate		
		CY 2019	CY 2020	CY 2021	CY 2019	CY 2020	CY 2021
1	Texas	10,355	10,410	6,830	13.7%	0.5%	-2.5%
2	Pennsylvania	6,897	7,148	5,096	10.1%	3.6%	7.7%
3	Alaska	3,250	3,429	2,288	-0.1%	5.5%	1.8%
4	Louisiana	3,230	3,212	2,186	13.7%	-0.6%	1.8%
5	Oklahoma	3,175	2,786	1,701	10.4%	-12.2%	-10.1%
6-10	Next 5 States	10,204	10,328	6,984	9.8%	1.2%	1.7%
	All Other	3,781	3,300	2,193	2.4%	-12.7%	-2.5%

Source: U.S. Energy Information Administration. Production does not directly correspond to DEP data. Includes all production sources and well types. Production and growth rates for CY 2021 are through August. Production in billion cubic feet. Next 5 States includes Ohio, Colorado, West Virginia, Wyoming and New Mexico.

## Price Trends

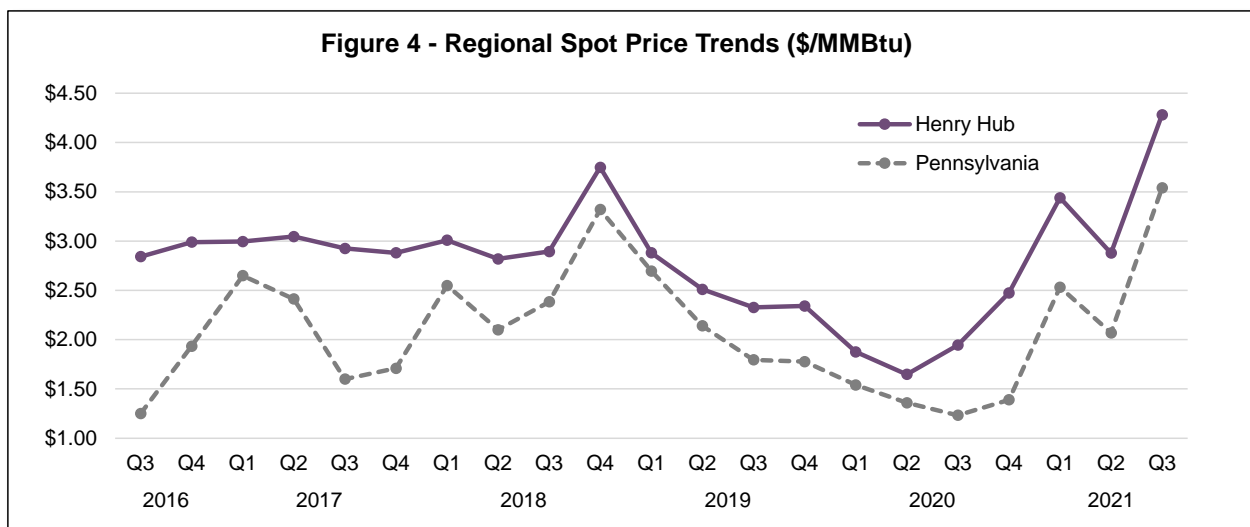
**Table 5** displays recent trends in natural gas spot prices at the Henry Hub and an average price for two major Pennsylvania hubs. These data show that the Henry Hub price increased by 120.1% from the same period in 2020 and the average Pennsylvania price increased by 187.1%. These prices have recorded significant gains due to the combination of weaker-than-usual supply growth and demand rebounding from closures and mitigation efforts related to the COVID-19 pandemic in 2020. Current forecasts project that prices will remain elevated in the near-term due to global supply and demand pressures.

**Table 5: Regional Spot Price Trends**

	2020			2021		
	Q2	Q3	Q4	Q1	Q2	Q3
Henry Hub	\$1.65	\$1.95	\$2.47	\$3.44	\$2.88	\$4.28
Growth Rate	-34.4%	-16.4%	5.6%	83.4%	74.7%	120.1%
PA Average	\$1.36	\$1.23	\$1.39	\$2.53	\$2.07	\$3.54
Growth Rate	-36.5%	-31.3%	-21.8%	64.4%	52.2%	187.1%

Source: Bentek Energy. Prices in \$/MMBtu. 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 21 quarters. The figure shows the precipitous decline in national and regional prices from late 2018 to mid-2020. Since then, both prices have increased to their highest levels in several years due to strong demand and limited production.



## Staff Acknowledgements

This report was produced by Jesse Bushman and Rachel Flaugh. Questions regarding this report can be directed to [jbushman@ifp.state.pa.us](mailto:jbushman@ifp.state.pa.us).