



The U.S. Department of Energy's Office of Fossil Energy (FE) supports research and development of technologies that can reduce the volume of natural gas (e.g., methane) flared or vented (released) into the atmosphere during crude oil and natural gas exploration, production, processing, transportation, and storage operations. This fact sheet was created by FE to inform stakeholders on state-level production and regulatory activity regarding natural gas flaring and venting. FE's research portfolio includes efforts to reduce methane (and other hydrocarbon) flaring through the application of improved technologies to capture and utilize small volumes of natural gas at remote locations, as well as technologies to reduce (primarily) methane release during midstream gas processing and transportation. Intermittent flaring that occurs as a result of routine well testing, production facility process shutdowns, or facility and pipeline infrastructure maintenance, are normal aspects of safe oil and natural gas production. Increases in domestic oil and natural gas production have resulted in significant infrastructure buildouts, however, natural gas pipeline capacity constraints have led to regional increases in the flaring of associated gas in some unconventional plays (e.g., Permian Basin in Texas and New Mexico and Bakken Shale in North Dakota) in order to enable oil production.

Kentucky Producing Basins and Plays

Over half of Kentucky's counties produce oil and/or natural gas. Most of these counties are located where the Illinois and the Appalachian Basins extend into the commonwealth—in its eastern and western corners ([Figure 1](#)). The Devonian (Ohio) Shale is a historical source of natural gas. The [Kentucky Geological Survey](#) reports that an overwhelming majority of Kentucky's oil and gas wells are marginal (stripper) wells that produce



Figure 1: Kentucky basins and major unconventional oil and gas plays outlined.
Source: EIA

at low rates—the median oil production rate is less than 1 barrel per day and the median natural gas production rate is on the order of 10 thousand cubic feet (Mcf) per day. The New Albany Shale is an unconventional gas play that has undergone significant study and testing in southern Indiana and Kentucky. However, it still remains an emerging play in the region.

The U.S. Energy Information Administration (EIA) estimated Kentucky's proved reserves as [9 million barrels of](#)

Kentucky Oil and Natural Gas Statistics (EIA)

	2013	2014	2015	2016	2017	2018
Crude Oil Production (Average Thousand Barrels/Day)	6	7	8	7	7	6
Natural Gas Gross Withdrawals and Production (Average MMcf/Day)	259	255	263	251	243	N/A
Natural Gas Gross Withdrawals and Production (Vented and Flared) (MMcf/Day)	Most wells that may flare would be below the threshold for requiring any type of registration from the Kentucky Division for Air Quality. *					
Natural Gas Gross Withdrawals and Production (Oil Wells) (Mcf/Day)	Operators report gas production from oil wells only if they sell the production. In such cases, they would rolled the report into the overall natural gas production reports. **					
Natural Gas Producing Wells	14,557	19,256	18,698	18,246	N/A	N/A
Gas Producing Oil Wells	340	Operators only need to report gas production from oil wells to the commonwealth if they sell the production. In these cases, they report it as part of the natural gas production volume. **				

MMcf - million cubic feet

Mcf - thousand cubic feet

* Information provided by the Kentucky Division for Air Quality

**Information provided by the Kentucky Division of Oil and Gas

2017 ranking among 32 U.S. oil and natural gas producing states — Oil: 21 Natural Gas: 19

oil and 1.22 trillion cubic feet (Tcf) of natural gas. The agency has determined that technically recoverable reserve estimates for the entire New Albany Shale stand at 189 million barrels of oil and 11 Tcf of natural gas. The Rogersville Shale is another potentially emerging shale gas play in eastern Kentucky. Although a number of wells have been drilled in Kentucky and West Virginia, the results remain confidential. [Published data](#) appears to show a steep decline rate for gas and no natural gas liquids produced.

Kentucky Key Regulations Associated with Flaring and Venting

Kentucky allows flaring and venting, as long as operators are in compliance with applicable rules and regulations. However, the volume of flared and vented natural gas is not available and/or reported. Kentucky does not have high-volume hydraulically fractured wells flaring large amounts of natural gas during the production of natural gas liquids and oil. According to the Kentucky [Division for Air Quality](#), most wells, if any, that may flare would be extremely small and below the threshold for requiring any type of air permit or air registration from the [Kentucky Department for Environmental Protection](#) (DEP). The DEP is also home to the Division for Air Quality and the Division of Compliance Assistance, which assist businesses with complying with the commonwealth's environmental regulations. Oil and gas producers in Kentucky are subject to comply with federal regulations, which the Division for Air Quality enforces.

The [Division of Oil and Gas](#) of the Kentucky Department of Natural Resources regulates the oil and natural gas industry in the commonwealth and conserves and protects oil and gas reserves in Kentucky. The Division of Oil and Gas maintains a well history database for each well that contains data relative to the well's permit, operator, location, pertinent dates, and completion. It shares this information with the Kentucky Geological Survey to assist in the compilation of [oil and gas data](#). In March 2016, the agency's Oil Division published the [Oil and Gas Well Operator's Manual](#). Although the document does not specifically address natural gas venting or flaring, it does serve as a guidance document and reference manual for well operators to coordinate with commonwealth and federal agencies that regulate drilling, production, operation and abandonment of oil and gas wells.

[Kentucky Revised Statutes Chapter 353, Mineral Conservation and Development](#), addresses venting and flaring regulations. Section 353.160 allows for flaring of natural gas in conjunction with crude oil production. It stipulates that operators may not waste natural gas or permit it to escape from any well or pipeline when they can reasonably prevent it. In situations where gas waste (via venting or flaring) is necessary, the owner or operator shall use all reasonable diligence to minimize waste to the extent possible. Additionally, Section 353.520 of this legislation prohibits well operators from wasting oil or gas while locating, drilling, equipping, operating, or producing any oil or gas well. This section also prohibits the

unnecessary or excessive loss of oil and gas by spillage, venting, or destruction.

The Kentucky Division of Compliance Assistance offers operators another resource for understanding applicable federal and commonwealth natural gas venting and flaring regulations. In August 2016, it published a [Compliance Guide](#), which outlines requirements stipulated in 40 CFR 60, Subparts OOOO and OOOOa, as well as potential mandates from the Kentucky DEP.

Kentucky State Points of Contact

Kentucky Department of Natural Resources; Division of Oil and Gas

Contact this agency for additional information on oil and gas regulations.

Website: <http://oilandgas.ky.gov/Pages/Welcome.aspx>

Email: dennis.hatfield@ky.gov

Phone: 502-573-0147

Kentucky Department for Environmental Protection; Division for Air Quality

Contact the Division for Air Quality at DEP for information about air monitoring and permitting programs.

Website: <http://air.ky.gov/>

Email: Melissa.Duff@ky.gov

Phone: 502-564-3999

Visit energy.gov/fe/state-natural-gas-flaring-and-venting-regulations for a digital version of this fact sheet that includes hyperlinks to information sources.