



The U.S. Department of Energy's Office of Fossil Energy and Carbon Management (FECM) 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 production, processing, transportation, and storage operations. Methane is a potent greenhouse gas (GHG) and minimizing its release across the oil and natural gas supply chain is critical to the realization of a net GHG benefit and reducing climate and environmental impacts of carbon-based fuels. This fact sheet was created by FECM to inform stakeholders on state-level production and regulatory activities, as they relate to natural gas flaring and venting. FECM's research portfolio includes efforts to reduce natural gas 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 methane release during upstream production operations, as well as midstream natural gas processing and transportation. While flaring activities in the prolific unconventional shale plays have steadily increased between 2011-2019 due to higher oil production levels and natural gas pipeline takeaway capacity constraints, this trend took a sharp downturn since 2020 as a result of significant decline in demand for oil. Other factors include federal and state regulatory efforts to reduce methane emissions, companies taking voluntary actions and measures to minimize flaring of associated natural gas, and additional pipeline projects connecting sources of supply and consumption.

Virginia Producing Plays and Basins

The oil and natural gas productive area of the Appalachian Basin extends slightly across the western border of Virginia ([Figure 1](#)). As reported by the Virginia Energy (VE), small amounts of oil and gas condensate are produced from Paleozoic rocks in only a few counties (primarily Wise and Lee Counties) in the far western corner of the commonwealth. These include two oil fields in Lee County (Rose Hill and Ben Hur) and more than a dozen gas fields in Wise, Dickenson, and Buchanan Counties. VE reports that some gas wells produce from formations at 3,000–6,000 feet, but the majority of wells produce coalbed methane from



Figure 1: Virginia oil and gas producing areas Source: EIA

depths of 1,800–2,200 feet in fields like Nora, Oak Wood, and Middle Ridge. Wells testing the Devonian-aged shales along the western border of the state have not proven to be commercial. Mesozoic formations in the Taylorsville Basin north of Richmond, where hydrocarbons were

found in the 1980s at depths between 1,000–5,500 feet, have garnered some interest from producers—but they have not proven commercial viability. The [U.S. Geological Survey](#) estimates undiscovered gas resources of more than 1 trillion cubic feet (Tcf) for the Taylorsville Basin.

Virginia has no significant crude oil reserves and only a small amount of crude oil production—all of which is from wells in the far southwestern corner of the state. Although Virginia holds less than 1 percent of the nation's total natural gas reserves, the state contains one-fifth of U.S. coalbed methane proved reserves—the third-largest amount of any state. According to the [U.S. Energy Information](#)

Virginia [Oil](#) and [Natural Gas](#) Statistics (EIA)

	2015	2016	2017	2018	2019	2020
Crude Oil Production (Average Barrels/Day)	30	19	19	14	16	14
Natural Gas Gross Withdrawals and Production (Average MMcf/Day)	350	329	316	305	291	281
Natural Gas Gross Withdrawals and Production (Vented and Flared) (MMcf/Day)	The state does not require operators to measure or report venting or flaring volumes.*					
Natural Gas Gross Withdrawals and Production (Oil Wells) (Mcf/Day)	22	13.7	11	5.5	13.7	8
Natural Gas and Gas Producing Oil Wells (thousands):	8.1	8.2	8	8	8	8

MMcf – million cubic feet

Mcf – thousand cubic feet

*Information provided by the Virginia Energy

Ranking among 32 U.S. oil and natural gas producing states— [Oil](#): 32 (2021) [Natural Gas](#): 17 (2020)

Administration (EIA), more than four-fifths of the state's natural gas production comes from coalbed methane wells drilled into coal-rich formations rather than from conventional natural gas reservoirs.

Virginia Key Regulations Associated with Flaring and Venting

VE's Division of Gas and Oil regulates oil and gas operations, issues permits, and conducts inspections of well sites. The Virginia Department of Environmental Quality (DEQ) administers state and federal laws and regulations for air quality, issues permits, conducts inspections and monitoring, and enforces regulations and permits.

The Virginia Gas and Oil Act (Code of Virginia, Title 45.1, Chapter 22.1) and Virginia Gas and Oil Regulations (Virginia Administrative Code, Title 4, Agency 25, Chapter 150) stipulate that the Virginia Gas and Oil Board governs oil and gas exploration, drilling, and production operations. As outlined in section 45.1-361.27, the Gas and Oil Board Director has the authority to promulgate and enforce rules, regulations, and orders necessary to prevent the escape of the commonwealth's gas and oil resources, among other objectives.

Administrative Code 4VAC25-150-410, *Venting and Flaring of Gas; Escape of Oil*, prohibits well operators from allowing crude oil or natural gas to escape from any well, gathering pipeline, or storage tank. Specifically, this rule stipulates that operators shall not flare or vent any gas from a well for more than seven days after completion of the well. The exception to this rule is for situations involving well cleaning (such as when the blowing of gas is needed to remove accumulated formation fluid that has restricted efficient production); well safety; or for activities that are specifically excluded from the definition of "waste." The Virginia Gas and Oil Board Director may also provide approvals for other operational reasons that operators request in advance. Further, this rule requires that operators only use venting as a last resort when flaring is neither safe nor feasible.

In September 2018, Virginia announced its plans to develop regulations for limiting leaks of methane from natural gas infrastructure and landfills, with the DEQ starting its work on the methane-control framework. As of February 2019, Virginia established an Ad Hoc Work Group with cross-sector representatives "to support DEQ in the collection and evaluation of data to inform the regulation development process."

Virginia State Points of Contact

Virginia Energy; Division of Gas and Oil

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

Website: <https://www.energy.virginia.gov/gas-oil/gasoil.shtml>

Email: GasOilinfo@energy.virginia.gov

Phone: 276-415-9700

Virginia Department of Environmental Quality; Air Division

Contact the Air Division at Virginia DEQ for more information on compliance with air quality regulations.

Website: <https://www.deq.virginia.gov/air>

Email: Michael.Dowd@DEQ.Virginia.gov

Phone: 804-698-4284

Visit <https://www.energy.gov/fecm/findyourstate-natural-gas-flaring-and-venting-regulations-fact-sheets-state> for a digital version of this fact sheet that includes hyperlinks to information sources.



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