U.S. DEPARTMENT OF ENERGY | Fossil Energy and Carbon Management

Oklahoma Natural Gas Flaring and Venting Regulations

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.

Oklahoma Producing Plays and Basins

Oklahoma forms the heart of the Mid-Continent oil and gas producing region, and contains three major basins—the Anadarko, Ardmore, and Arkoma—as well as a portion of the Cherokee Platform (Figure 1). The bulk of Oklahoma's historical oil production is from Pennsylvanian aged rocks, but oil and gas reservoirs range from Cambrian to Cretaceous in age. The state's major legacy fields have produced more than 100 million barrels of oil. According to the U.S. Energy Information Administration (EIA), Oklahoma's proved reserves are 1.76 billion barrels of oil and 30.1 trillion cubic feet (Tcf) of natural gas (2020).

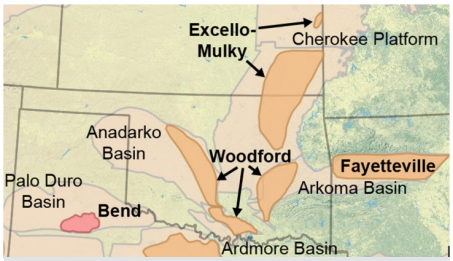

Figure 1: Oklahoma basins and major unconventional oil and gas plays outlined. *Source: EIA*

Currently, development is centered on a number of unconventional plays that include the Devonian-aged Woodford Shale (all three basins), the Caney/Woodford Shale (Arkoma and Ardmore) and the Mississippian Springer/Goddard Shale (Anadarko), among others. The large majority of horizontal oil and gas well completions are in the Woodford Shale. Production economics shifted the focus of the Woodford play toward condensate and oil areas such as the "Cana" (western Canadian County) area in 2007 and the "SCOOP" (South Central Oklahoma Oil Province) area in 2012.

Three recent U.S. Geological Survey (USGS) oil and gas assessments have included the Woodford Shale in Oklahoma. An assessment of the natural gas resources of the Arkoma Basin determined a Woodford total undiscovered resource of 10.7 Tcf of gas. An oil and gas assessment of the Anadarko Basin determined a Woodford total undiscovered

Oklahoma Oil and Natural Gas Statistics (EIA)

	2015	2016	2017	2018	2019	2020	2021
Crude Oil Production (Average Thousand Barrels/Day)	457	425	455	547	519	469	392
Natural Gas Gross Withdrawals and Production (Average MMcf/Day)	6,848	6,762	6,887	7,879	8,318	7,613	7,047
Natural Gas Gross Withdrawals and Production (Vented and Flared) (MMcf/Day)	OK does not maintain a database of total annual gas vented or flared						
Natural Gas Gross Withdrawals and Production (Oil Wells) (MMcf/Day)	546	508	576	223	232	225	N/A
Natural Gas and Gas Producing Oil Wells (Thousands)	59.5	57.1	55.5	67	62.3	59	N/A

MMcf – million cubic feet

2021 ranking among 32 U.S. oil and natural gas producing states — Oil: 6 Natural Gas: 6

oil resource of 393 million barrels and a total undiscovered gas resource of 16 Tcf. An oil and gas assessment of the Cherokee Platform in Kansas, Missouri, and Oklahoma determined a total undiscovered oil resource of 460 million barrels and a total undiscovered gas resource of 644 billion cubic feet (Bcf) across all three states.

Oklahoma Key Regulations Associated with Flaring and Venting

The Oil and Gas Division of the Oklahoma Corporation Commission regulates drilling, permitting, and waste gas as it pertains to flaring and venting in Chapter 10 of the Oklahoma Register, which went into effect on September 14, 2018. The rules state that wasting oil or gas is prohibited. Exceptions to this rule are found in Subsection 3-15 of Chapter 10, which delineates permitting requirements and temporary actions to be implemented to reduce hazards to human health. Permit applications include estimates of volumes to be flared or vented, but the state does not aggregate these estimates nor collect actual totals.

The Oklahoma Department of Environmental Quality (DEQ) operates both major (Title V) and minor source permitting programs under 27A Okla. Stat. § 2-5-102, et seq., and the Oklahoma Administrative Code (OAC), Title 252, Chapter 100. Additionally, EPA has given Oklahoma authority to implement federal New Source Performance Standards (NSPS), which are incorporated by reference into OAC 252:100, Appendix Q. Specifically, DEQ deals with a number of emission unit types located at oil and gas well sites (including storage tanks whose emissions may be controlled by flares), including 40 C.F.R. Part 60, Subparts OOOO and OOOOa. The type of permit required and whether the NSPS is applicable depends upon the particular facility's emissions (source classification). Requirements to operate flares and vapor recovery units (VRUs) may be incorporated into either a major source permit or a minor source permit depending on the particular facility.

Oklahoma State Points of Contact

Oklahoma Corporation Commission: Oil and Gas Division

Contact the Oil and Gas Division for information about oil and gas rules and regulations in Oklahoma.

Website: http://www.occeweb.com/OG/oghome.htm

Email: Bob.Mccoy@occ.ok.com

Phone: 405-521-2279

Oklahoma Department of Environmental Quality: Air Quality Division

Contact the Air Quality Division for information about air emission regulations and compliance.

Website: www.deq.state.ok.us/aqdnew/ComplianceEnforcement/

Email: Jason.Ballard@deq.state.ok.gov

Phone: 405-702-4176

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.