



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.

North Dakota Producing Plays and Basins

The [U.S. Geological Survey](#) has estimated that there are more than 7 billion barrels of undiscovered technically recoverable oil in the Williston Basin's Bakken and Three Forks formations ([Figure 1](#)) — and much of that oil is in North Dakota. According to the U.S. Energy Information Administration (EIA), proven reserves are [5.9 billion barrels of oil](#) and [12.2 trillion cubic feet of natural gas](#) (2018). In fact, of the Nation's 100 largest oil fields—as measured by reserves—20 are in North Dakota, which ranks second in the Nation after Texas in proved crude oil reserves. However, until the past decade, there was only modest oil production in the state, until new drilling technologies, such as horizontal drilling and hydraulic



Figure 1: North Dakota's Williston Basin showing extent of Bakken Shale and Three Forks plays *Source: [EIA](#)*

fracturing, helped increase production from the Bakken Shale. North Dakota has only 2.4 percent of the Nation's total natural gas reserves, and it accounts for 2.6 percent of U.S. natural gas production. In 2019, North Dakota ranked second behind Texas, both in U.S. oil production and vented and flared natural gas. In 2018,

North Dakota accounted for 31 percent of the total U.S. vented and flared natural gas (1.28 billion cubic feet per day).

North Dakota Key Regulations Associated with Flaring and Venting

The state of North Dakota bans the venting of natural gas and requires that vented casinghead gas be burned through a flare with the estimated volume flared reported to the director of the oil and gas division at the North Dakota Department of Mineral Resources ([Administrative Code 43-02-03-45: Vented Casinghead Gas](#)). All oil and gas wells within the state must be registered with the North Dakota Division of Air Quality and adhere to emission controls. Permitting requirements are applicable for oil or gas well production

North Dakota [Oil](#) and [Natural Gas](#) Statistics (EIA)

	2014	2015	2016	2017	2018	2019
Crude Oil Production (Average Thousand Barrels/Day)	1,080	1,177	1,042	1,074	1,278	1,437
Natural Gas Gross Withdrawals and Production (Average MMcf/Day)	1,269	1,602	1,668	1,887	2,353	2,906
Natural Gas Gross Withdrawals and Production (Vented and Flared) (MMcf/Day)	355	292	192	243	404	560*
Natural Gas Gross Withdrawals and Production (Oil Wells) (MMcf/Day)	38	32	28	26	31	38*
Natural Gas and Gas Producing Oil Wells (Thousands)	11.9	13.2	13.7	14.5	15.6	16.0*

MMcf - Million cubic feet

* Estimated

2019 ranking among 32 U.S. oil and natural gas producing states — [Oil](#): 2 [Natural Gas](#): 11

facilities that are classified as a major stationary source or a major modification. These requirements include the prevention of significant deterioration (PSD) of air quality—a number that is calculated based upon the average daily amount of gas burned, incinerated, and/or flared per day ([North Dakota Department of Environmental Quality, Division of Air Quality](#)).

All flares must adhere to North Dakota Administrative Code (NDAC) [33.1-15-07-02](#)—Requirements for organic compounds gas disposal, NDAC [33.1-15-03-03.1](#)—Restrictions Applicable to Flares, NDAC [33.1-15-20](#)—Control of Emissions from Oil and Gas Well Production Facilities, and [40 CFR 60.18](#). Flares must be equipped and operated with an automatic ignitor or a continuous burning pilot. Visible flare emissions must not exceed 20 percent opacity except that a maximum of 60 percent opacity is permissible for not more than one six-minute period per hour.

The North Dakota Industrial Commission (NDIC) established [Order No. 24665](#) as a system of gas capture to reduce the volume of natural gas flared in the state. Effective on July 1, 2014, this Order established a drilling permit review policy that requires producers to submit a gas capture plan with every drilling permit application. This Order also requires that producers submit gas capture plans at spacing hearings. These plans should include information on area-gathering system connections and processing plants, the rate and duration of planned flowback, current system capacity, a timeline for connecting the well, and a signed affidavit verifying that the plan has been shared with area midstream companies.

- Allow companies drilling outside of the In April 2018, the [NDIC amended core areas of western North Dakota's the flaring reduction rules](#) to make the oil patch to drill up to six wells for up to one year without capturing the gas

- Allow operators to accumulate credits over a six-month time period instead of only three months
- Give companies credit if the natural gas they produce is used in the state to power equipment or facilities
- Allow companies that are meeting targets to forgo a capturing plan with their drilling permit applications.

In November 2018, the NDIC made additional changes due to the high rate of growth in gas production. The NDIC revised the goals of the gas capture policy to focus on increasing the volume of captured gas, rather than reducing the flared volume. Currently set at 88 percent, the capture goal for associated gas will increase to 91 percent on November 1, 2020. The NDIC also removed the goals related to reducing the number of wells flaring and reducing the duration of flaring.

North Dakota State Points of Contact

Department of Mineral Resources, Oil and Gas Division

The [Department of Mineral Resources' Oil and Gas Division](#) regulates the drilling and production of oil and gas in North Dakota. Contact them for questions regarding oil and gas regulatory issues.

Website: <https://www.dmr.nd.gov/oilgas/>

Email: oilandgasinfo@nd.gov

Phone numbers: 701-328-8020

North Dakota Department of Environmental Quality, Division of Air Quality

Contact them for information about flaring regulations associated with air quality and the control of pollutants including details about when a flare may be used at a well site, the type of flare that is permissible, and proper flare operation.

Website: <https://deq.nd.gov/AQ/oilgas/OilGasWell.aspx>

Email: deq@nd.gov; AirQuality@nd.gov

Phone: 701-328-5150; 701-328-5188

North Dakota Industrial Commission, North Dakota Oil and Gas Research Program

The North Dakota Industrial Commission has jurisdiction over the volume of gas flared at a well site in regards to conserving mineral resources. The North Dakota Oil and Gas Research Program, an initiative of the NDIC, is a joint state/industry effort that was established in 2003 supports research related to oil and natural gas exploration and production. Recent projects include efforts to develop methods for reducing flaring through small-scale gas-to-liquids, compressed natural gas, and liquefied natural gas systems, as well as small-scale electricity generation via gas turbines. Contact them for questions regarding research focused on flaring reduction.

Website: <https://www.dmr.nd.gov/ogt/Default.aspx>

Email: ndicinfo@nd.gov

Phone: 701-328-3722

North Dakota Pipeline Authority

The North Dakota Pipeline Authority, which is governed by the NDIC, supports the production, transportation, and utilization of North Dakota energy-related commodities including participation in pipeline facilities through financing, planning, joint ownership, or other arrangements at the request of a person giving a notice of intent. Contact them for questions about data analytics and production forecasting for the transportation and processing industry.

Website: <https://northdakotapipelines.com/>

Email: jjkringstad@ndpipelines.com

Phone: 701-220-6227

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.