



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.

Producing Plays and Basins

The Federal Outer Continental Shelf (OCS) includes the Alaska, Atlantic, Gulf of Mexico, and Pacific Regions; each region varies in production and potential development of oil and natural gas resources. Federal Offshore oil and natural gas production is almost entirely sourced from the Gulf of Mexico's (GoM) Central and Western planning areas ([Figure 1](#)).

GoM's Central and Western Planning areas, offshore Texas, Louisiana, Mississippi and Alabama, remain the Nation's primary offshore source of oil and gas, generating about 97 percent of all OCS oil and gas production. The estimated reserves for developed or developing fields for the Federal Offshore GoM are 6.617 trillion cubic feet (Tcf) of dry [natural gas](#) and 5.191 billion barrels of [crude oil](#) (as of December 31, 2018).

The Bureau of Ocean Energy Management (BOEM) has [estimated](#) the mean undiscovered technically recoverable oil and natural gas resources across the entire GoM at 141.76 Tcf of natural gas and 48.46 billion barrels of oil. Together with contingent resources and expected reserves appreciation, these estimates mean that roughly three-quarters of the oil endowment and half of the natural gas endowment of the GoM remain to be produced. These resources are spread across more than 25 shelf and slope plays, largely in Miocene, Lower Tertiary, Pliocene, and Mesozoic aged deposits.

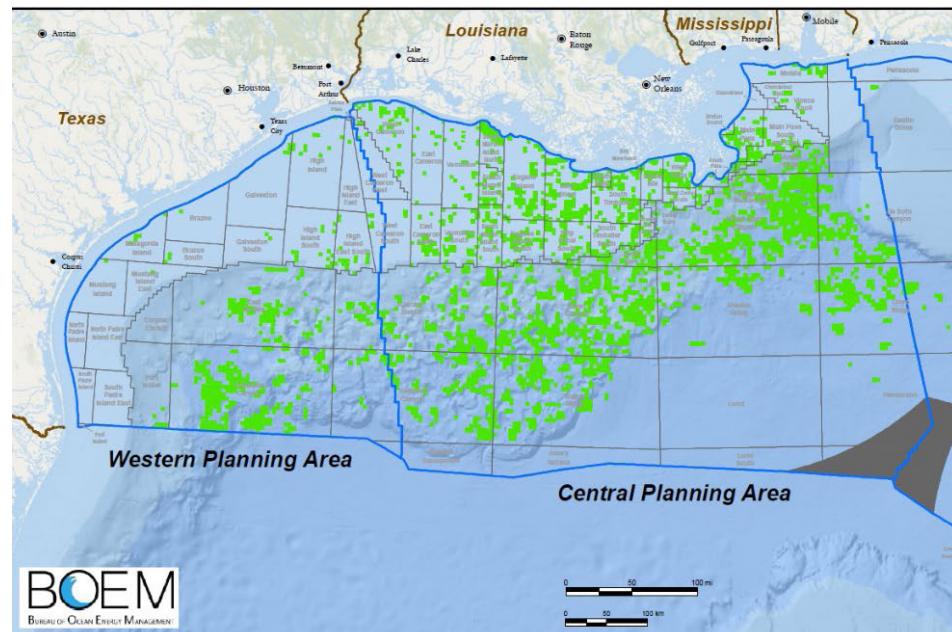


Figure 1: Gulf of Mexico leasing planning areas (outlined in blue), with the continental shelf and continental slope regions depicted in shades of blue and active leases, as of 2/1/2018, highlighted (green). There are 2,530 leases in the Gulf of Mexico, covering almost [13.5 million acres](#) (as of 5/1/2020)

Key Regulations and Important Initiatives Associated with Venting and Flaring

Since the 1990s, declines in gas production and increases in oil production have influenced venting and flaring volumes within the Gulf of Mexico. Between 2011 and 2015, flaring and venting volumes showed that 60–70 percent of gas was flared and 30–40 percent was vented. Additionally, between 70–80 percent of those vented or flared volumes was gas from oil wells while 20–30 percent was gas from gas wells. The data in the table

above show that over the 2012–2018 time period (2019 data is not available as indicated) approximately 1.25 percent of gross natural gas production has been reported as flared or vented, on average. Historically, offshore flaring and venting activity is roughly split between hurricane-related and non-hurricane related activities. Flaring and venting can occur as a result of weather-related shutdowns or deepwater pipeline repairs, as a result of new facilities being brought online or during well testing. Spikes in venting and flaring can be correlated with hurricane impacts, a factor that is not an issue in onshore flaring and venting.

Gulf of Mexico Oil and Natural Gas Statistics

	2012	2013	2014	2015	2016	2017	2018	2019
Crude Oil Production (Average Thousand Barrels/Day)	1,540	1,255	1,397	1,515	1,599	1,680	1,758	1,883
* Natural Gas Gross Withdrawals and Production (Average MMcf/Day)	4,185	3,635	3,495	3,583	3,344	2,954	2,721	2,743
Natural Gas Gross Withdrawals and Production (Vented and Flared) (MMcf/Day)	44.6	40.1	45.7	29.7	41.3	37.6	37.9	N/A
Natural Gas Gross Withdrawals and Production (Oil Wells) (MMcf/Day)	1,408	1,395	1,559	1,753	1,774	1,708	1,697	N/A
Natural Gas Producing Wells	1,892	1,588	1,377	1,156	988	872	781	N/A
Gas Producing Oil Wells	3,012	3,022	3,038	2,985	2,879	2,750	2,679	N/A

* Includes production from gas wells and gas from oil wells.

Regulations pertaining to flaring and venting on the U.S. OCS are controlled through Department of the Interior's Bureau of Safety and Environmental Enforcement (BSEE), which was previously named the Minerals Management Service. Title 30, Part 250, "Oil and Gas and Sulphur Operations in the Outer Continental Shelf-Oil," Subpart K "Oil and Gas Production Requirements," 250.1160 to 250.1164." Under current OCS venting and flaring regulations, an operator must request and receive approval from the BSEE Regional Supervisor to flare or vent natural gas, except in situations that include operational testing, emergencies, and equipment failures. Venting and flaring is also allowed for lease-use gas or as a means to burn other waste products. In these situations, duration and volumes are managed and limited by regulation and by the filing of operations plans, however, shorter time limits or additional volume restrictions may be imposed to prevent air quality degradation or the loss of reserves.

Offshore facilities processing more than 2,000 barrels of oil per day on average must install flare or vent meters with about 5 percent accuracy. Operators are required to report amounts of gas vented or flared and maintain records onsite detailing incidents of flaring and venting, including their amounts and durations. If meters are not required at a facility, operators may report gas flared or vented on a lease or unit basis.

BSEE Notices to Lessees (NTL) 2012 N-03 and NTL 2012-N04 provide guidance for requesting approval to flare or vent natural gas. Flaring or venting is permitted on a case-by-case basis at BSEE's discretion

on a limited basis: (1) when required in the national interest (e.g., when a major hurricane causes infrastructure damage); (2) when the operator demonstrates that production from the well completion would likely be permanently lost if the well were to be shut in; or (3) when the operator demonstrates that short-term flaring or venting would likely yield a smaller volume of lost natural gas than if the facility were shut in and restarted later (with flaring and venting necessary to restart the facility). BSEE does not consider the avoidance of lost revenue to be a justifiable reason for venting or flaring. In 2015, BSEE issued the Bureau Interim Directive BID-2015-G070 to govern procedures for processing flaring and venting requests. This directive clarified the three situations in which NTL exceptions would be granted. An extension to the time limit on a flaring and venting approval may be granted if the operator can show significant progress in addressing the reasons for flaring and venting since the last approval.

In 2015, BSEE also issued additional guidance on inspection procedures and the flaring or venting of low-volume flash gas from low-pressure production equipment. Inspectors must verify operator calculations of flared and vented gas volumes, proper recording of volumes, and maintenance of records. BSEE required inspectors to witness 10 percent of all oil sales meter and 5 percent of gas meter accuracy tests. BSEE also required inspectors to conduct site security inspections to ensure regulatory compliance and the protection of federal production.

Federal Agency Points of Contacts

Bureau of Ocean Energy Management

BOEM manages development of U.S. Outer Continental Shelf energy and mineral resources in an environmentally and economically responsible way. As of January 1, 2020, BOEM manages about 2,674 active oil and gas leases on over 14.2 million OCS acres.

Website: <https://www.boem.gov/>

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Bureau of Safety and Environmental Enforcement

BSEE has been the lead federal agency charged with improving safety and ensuring environmental protection related to the offshore energy industry, primarily oil and natural gas, on the U.S. Outer Continental Shelf.

Website: <https://www.bsee.gov/>

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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.