



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.

Producing Plays and Basins

Federal Outer Continental Shelf (OCS) Regions include the Alaska, Atlantic, Gulf of Mexico, and Pacific Regions; each varying 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 3.75 trillion cubic feet (Tcf) of dry natural gas and 4.08 billion barrels of crude oil (2020).

According to a 2021 Assessment of Undiscovered Oil and Gas Resources for the U.S. Outer Continental Shelf, released by the Bureau of Ocean Energy Management (BOEM), estimated mean undiscovered technically recoverable oil and natural gas resources across the entire GoM are 54.84 Bcf of natural gas and 29.6 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.

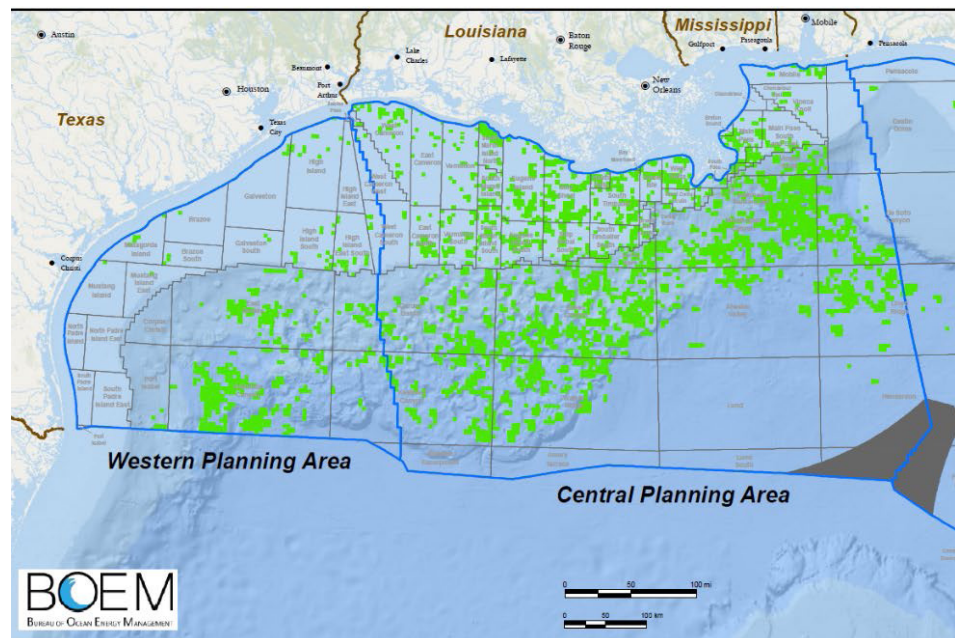


Figure 1: Gulf of Mexico leasing planning areas (outlined in blue), with the continental shelf and continental slope regions depicted in shades of blue and active leases, as of 2/1/2018, highlighted (green). There are 2,287 leases in the Gulf of Mexico, covering almost 12.1 million acres (as of May, 2021)

Key Regulations and Important Initiatives Associated with Venting and Flaring

Since the 1990s, declines in gas production and increases in oil production have influenced flaring and venting volumes within the Gulf of Mexico. According to the Department of Interior's Bureau of Safety and Environmental Enforcement (BSEE) (formerly the Minerals Management Service), between 2016 and 2020, flaring and venting volumes showed that 65–75

percent of gas was flared and 25–35 percent was vented. Additionally, between 80-90 percent of those vented or flared volumes was gas from oil wells while 10–20 percent was gas from gas wells. The data in the table below show that, from 2015–2021, on average, 1.22 percent of gross natural gas production has been reported as flared or vented.

Flaring and venting on the U.S. OCS is regulated by BSEE (Title 30, Part 250, "Oil and Gas and Sulphur Operations in the Outer Continental Shelf-Oil," Subpart K "Oil and Gas Production Requirements,"

Gulf of Mexico [Oil](#) and [Natural Gas](#) Statistics

	2015	2016	2017	2018	2019	2020	2021
Crude Oil Production (Average Thousand Barrels/Day)	1,515	1,600	1,681	1,759	1,898	1,644	1,706*
Natural Gas Gross Withdrawals and Production (Average MMcf/Day)	3,623	3,335	2,954	2,720	2,833	2,200	2,169*
Natural Gas Gross Withdrawals and Production (Vented and Flared) (MMcf/Day)*	28.2	26.4	27	29.3	32	28.4	22.4*
Natural Gas Gross Withdrawals and Production (Oil Wells) (MMcf/Day)	1,777	1,769	1,733	1,700	1,910	1,555	1,598*
Natural Gas Producing Wells	1,156	988	872	634	565	500	320*
Gas Producing Oil Wells (thousands)	3	2.9	2.8	2.5	2.4	2.3	1.8*

* Information provided by the U.S. Department of Interior's Bureau of Safety and Environmental Enforcement

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. Flaring and venting without BSEE approval 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 operational 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 flaring or venting meters with at least 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 estimate the volume of gas flared or vented.

BSEE *Notice to Lessees (NTL) No. 2020-N04* provides guidance for requesting approval to flare or vent natural gas. Flaring and venting is permitted by BSEE on a case by case basis at the agency's discretion under the following circumstances: (1) when the BSEE Director determines it is in the national interest; (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 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 goals include having inspectors witness meter provings conducted on 10 percent of all active oil royalty meters and witness meter calibrations conducted on 5 percent of all active gas royalty meters. BSEE also has a goal for inspectors to conduct site security inspections annually at every offshore facility 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 May 1, 2021, BOEM manages about 2,287 active oil and gas leases on over 12.1 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 <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.



U.S. DEPARTMENT OF
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For more information, visit:
[FECM website](https://www.fecm.gov/)

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