

U.S. Regulation of Oil and Gas Operations

Federal and state regulation of exploration, production, transportation, and more

Overview

Regulation of oil and gas operations has existed in various forms for over 100 years.¹ Regulation has several objectives: protecting the environment (including air and water quality), protecting cultural resources, protecting workers' and the public's health and safety, and reducing wasted resources.^{2,3,4}

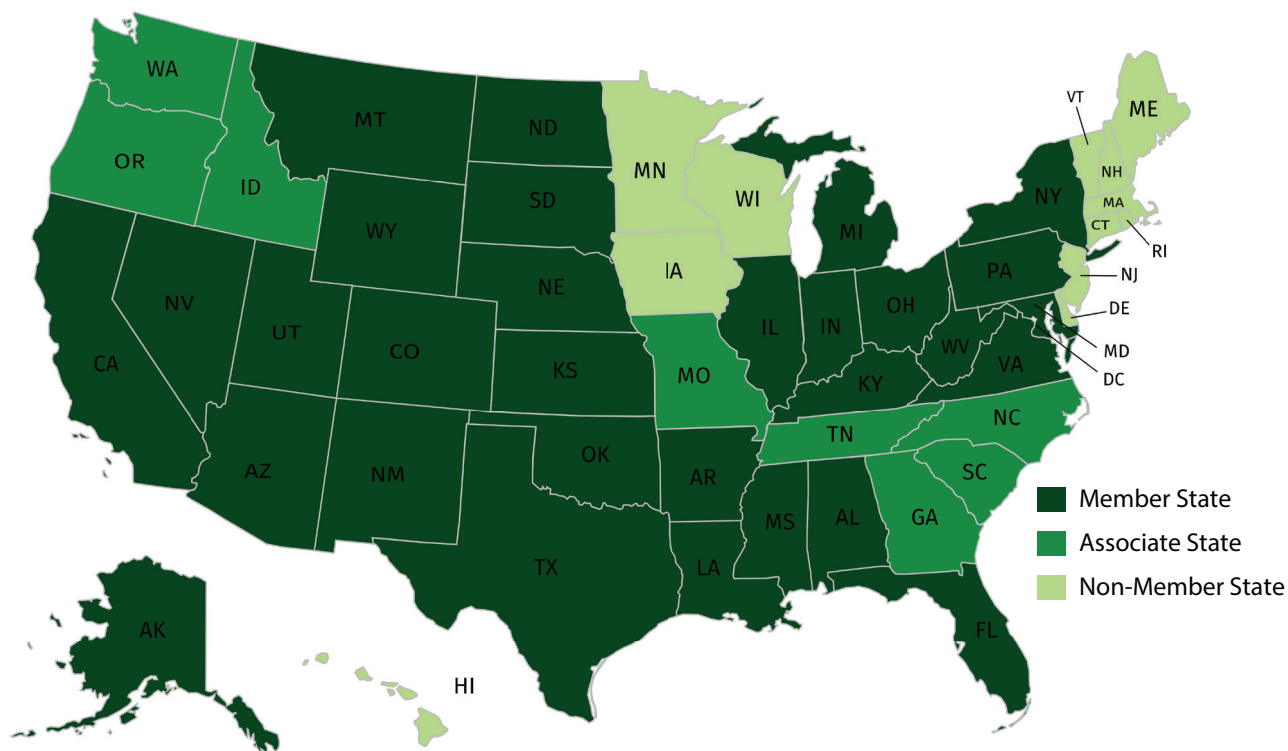
Federal, state, and local governments each regulate various aspects of oil and gas operations. Who regulates what depends on land ownership and whether federal regulations or state laws apply. In general, most drilling and production is regulated by the states. Federal regulations primarily safeguard water and air quality and worker safety, as well as exploration and production on Native American lands, federal lands, and the Outer Continental Shelf.

Regulations are implemented by the executive branches of local, state, and federal government based on the laws enacted by

local, state, and federal legislators. Public input is a formal part of regulation development. The Clean Air Act (1963), the Clean Water Act (1972), and the Safe Drinking Water Act (1974), plus later revisions to these laws, form the basis of most federal regulation of the oil and gas industry. State roles in regulating oil and gas drilling and production were formalized by the Interstate Oil & Gas Compact Commission (IOGCC), which formed in 1935 to set standards for oil and gas drilling and develop production regulations that the states agreed to enact.⁷

State Regulation of Exploration and Production⁸

Exploration and production on state and private land are regulated by each of the 33 oil- and gas-producing states. States also regulate all oil and gas operations in state waters that extend from the coast to 3 to 9 nautical miles from the shoreline, depending on the state. Local zoning may control



States belonging to the Interstate Oil & Gas Compact Commission.⁵ Image credit: American Geosciences Institute, produced with mapchart.net.⁶

some activities such as the minimum distance wells and other facilities must be set back from homes and businesses.

State regulations vary from state to state and over time. Early state regulations were largely focused on preventing waste, ensuring the rights of mineral owners to develop their resources, and conserving resources to ensure the viability of future production. Environmentally focused regulations have become increasingly prominent over time, especially since the 1970s.⁹ State-regulated activities include seismic and other geophysical surveys, leasing, drilling, hydraulic fracturing, oil and gas production, well closure, and site restoration. States enforce their regulations through permitting and regulatory inspections.

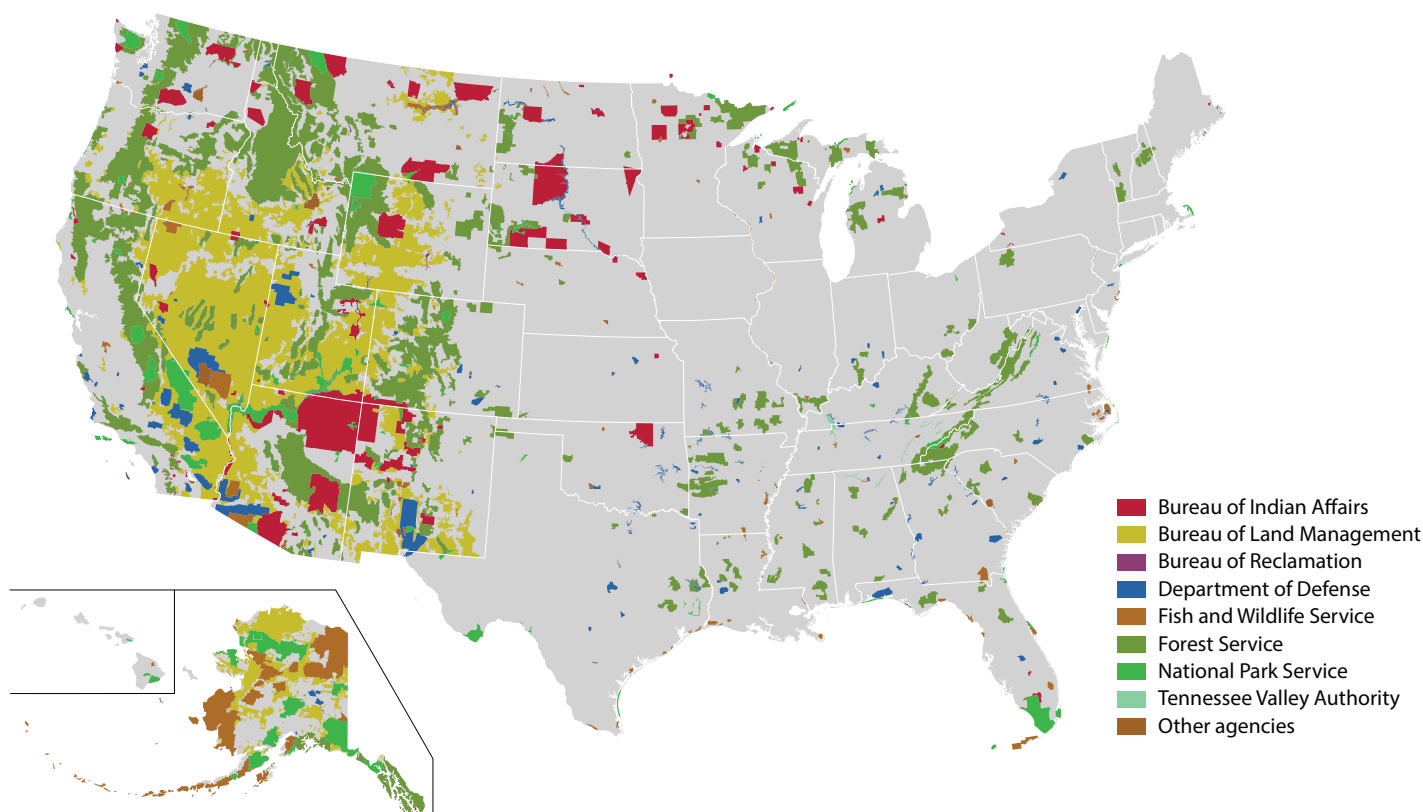
In fiscal year 2016, production from federal and Native American lands, onshore and in the Outer Continental Shelf, was 23% and 17% of total U.S. production for oil and gas, respectively.^{10,11,12}

Federal Regulation of Exploration and Production

On Non-Federal Land

The federal role in regulating exploration and production primarily focuses on environmental protection. The Environmental Protection Agency (EPA) sets standards on drinking water and air quality under the authority of the Clean Air Act, the Clean Water Act, and the Safe Drinking Water Act.¹⁴ In most cases, the EPA allows states to develop and implement the regulations necessary to meet federal standards. In a few areas, the EPA's regulatory role is more direct:

- The EPA requires the capture of all gases and fluids that come out of a well as it is being prepared for oil/gas production, including during hydraulic fracturing. This "green completion" rule, required for all natural gas wells since January 2015, requires equipment and procedures



Federal and Native American lands in the United States. Colors indicate which federal agency oversees and regulates activities on these lands. Image credit: U.S. Geological Survey.¹³

designed to prevent the emission of a group of chemicals called volatile organic compounds (VOC),¹⁵ and also capture methane, a potent greenhouse gas. Additional restrictions on methane and VOC emissions in the oil and gas industry that were issued in 2016 are delayed in legal disputes as of early 2018.¹⁶

- The EPA's Underground Injection Control program authorizes most states to regulate wells that dispose of oilfield waste, including produced water and hydraulic fracturing fluids that flow back up the well. However,



An advanced offshore blowout preventer (BOP). A BOP is a large, heavy set of valves fitted at the top of the well; if high pressures in the well overcome all other barriers, the BOP is designed to close off the well and the drill pipe to prevent oil or gas from escaping. BOPs of some kind are used on all oil and gas wells. In offshore drilling, the BOP is set on the seafloor or below the drilling-rig deck. Onshore, the BOP is connected to the top of the wellbore (below the drilling-rig deck). Image credit: Bureau of Safety and Environmental Enforcement.¹⁷

the EPA itself regulates these wells in four oil- and gas-producing states: Pennsylvania, Virginia, New York, and Michigan. The Underground Injection Control program aims to protect groundwater from contamination. It does not address earthquakes caused by underground wastewater injection on non-federal lands.¹⁸

On Federal Land (Onshore)

The Bureau of Land Management (BLM) has jurisdiction over almost all leasing, exploration, development, and production of oil and gas on federal and Native American lands. BLM rules and standards for drilling and production¹⁹ require all operations on federal land to comply with state and local regulations and protect life, property, and environmental quality. As of 2018, some federal drilling and production regulations enacted, revised, or proposed since 2008 are being re-evaluated or rescinded by the current Administration.²⁰

The National Park Service regulates the small amount of oil and gas activity in National Parks (roughly 550 active wells in 2015²¹), where the federal government owns the land surface but not the underlying oil, natural gas, or mineral resources.²²

Federal decisions about specific constraints on drilling and production on federal land (onshore and offshore) are based on the National Environmental Policy Act (1970).²³ This act requires federal agencies to assess the environmental impact of major federal actions, mainly by producing Environmental Impact Statements or Environmental Assessments.

Offshore

The federal government regulates offshore exploration and production for the Outer Continental Shelf (OCS), which extends from the edge of state waters (either 3 or 9 nautical miles from the coast, depending on the state) out to the edge of national jurisdiction, 200 nautical miles from shore.²⁴ The Bureau of Ocean Energy Management (BOEM) manages federal OCS leasing programs, conducts resource assessments, and licenses seismic surveys.²⁵ The Bureau of Safety and Environmental Enforcement (BSEE) regulates all OCS oil and gas drilling and production. These two agencies, plus the Office of Natural Resources Revenue,

which collects and disburses rents and royalties from offshore and onshore federal and Native American lands, were formed in the 2010 and 2012 reorganizations of the Minerals Management Service.

BSEE drilling and production regulations have been extensively revised in response to the 2010 Deepwater Horizon blowout and oil spill and a National Academies assessment of ways to prevent such incidents in the future.²⁶ The regulations include requirements for enhanced well design, improved blowout preventer design, testing and maintenance, and an increased number of trained inspectors.²⁷ The current Administration is in the process of reviewing and revising these regulations.

Regulation of Transportation, Storage, Refining, and Marketing

States regulate the operation of oil pipelines, as well as the construction and operation of natural gas gathering lines (small pipelines that move gas from the well to a processing facility or transmission line).^{28,29} The federal Department of Transportation (DOT)'s Pipeline and Hazardous Materials Safety Administration regulates the operation of natural gas pipelines that provide long-distance transmission and local customer distribution,³⁰ as well as underground natural gas storage.³¹ The EPA regulates air emissions from refineries and fuel distribution systems, including pipelines, trucks, and fuel dispensing facilities or service stations.³²

The Federal Energy Regulatory Commission (FERC)³³ regulates the transportation of oil through interstate oil pipelines but does not oversee pipeline operations. FERC also reviews applications for the construction and operation of natural gas pipelines and liquefied natural gas (LNG) export and import terminals to certify their compliance with safety and environmental laws.

The Federal Railroad Administration (part of the DOT) is responsible for railroad safety, including rail transport of crude oil and refined products. The Pipeline and Hazardous Materials Safety Administration (DOT) and the Transportation Security Administration (Department of Homeland Security) issue safety standards for railroads. Approximately 11% of crude oil and petroleum products were transported by rail in 2014, up from 2.6% in 2009.³⁴

Laws and Regulations Setting Energy Preferences

States and the federal government set requirements to encourage the use of particular energy types. Twenty-nine states have renewable portfolio standards that require electric utilities to sell a minimum percentage or amount of renewable energy.³⁵ On the federal level, the Renewable Fuels Program is overseen by the EPA in consultation with the Department of Agriculture. The Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007 require that set amounts of renewable fuel be used in place of gasoline, heating oil, or jet fuel.³⁶ The applicable renewable fuels include ethanol, cellulosic biofuel, diesel from biomass, and other advanced biofuels. In 2018, the standards set by the EPA under authorization of the 2005 and 2007 acts require the use of 19.29 billion gallons of renewable fuels.³⁷ This results in most gasoline containing 10% ethanol (E10). E15 and E85, with 15% or up to 85% ethanol, respectively, are locally available and can be used in some vehicles.³⁸

Other Regulations

Regulations not covered here include worker safety rules set by the Occupational Safety and Health Administration (see "Health and Safety in Oil and Gas Extraction" in this series for more information); regulations protecting antiquities and historic and religious sites; and the Endangered Species Act.³⁹ In addition, the oil and gas industry is bound by state and federal financial reporting laws and tax regulations.⁴⁰ Because oil and natural gas are traded globally and many oil and gas companies operate internationally, international trade rules and the laws of various other countries also impact the U.S. oil and gas industry.

References & More Resources

For a complete listing of references, see the "References" section of the full publication, *Petroleum and the Environment*, or visit the online version at: www.americangeosciences.org/critical-issues/petroleum-environment

Joy, M.P. and Dimitroff, S.D. (2016). Oil and gas regulation in the United States: overview. Westlaw, June 1, 2016.
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