Congressional Research Service
Informing the legislative debate since 1914

IN FOCUS

March 19, 2025

Greenhouse Gas Reporting for Carbon Injection and Sequestration Through Enhanced Oil Recovery Wells

The U.S. Environmental Protection Agency's (EPA's) Greenhouse Gas Reporting Program (GHGRP) requires certain facilities to report their emissions of greenhouse gases (GHGs). The GHGRP also requires annual reporting of carbon dioxide (CO_2) that is injected underground for enhanced oil recovery (EOR) or geologic sequestration. In April 2024, EPA established a new GHGRP source category (a group of emissions sources subject to the same or similar standards) and associated reporting requirements for facilities that use wells to inject CO_2 into underground formations during EOR operations. EOR is a production technique used to increase the amount of oil available from a reservoir through the injection of pressurized fluids into underground oil-bearing formations. CO_2 is the most common gas injection agent used in EOR projects. During this process, some of the injected CO_2 remains underground, referred to as "incidental" CO_2 storage. The National Energy Technology Laboratory estimates that 30%-40% of the CO_2 is stored in each injection cycle, depending on the reservoir characteristics. The CO_2 injected for EOR is most commonly sourced from naturally occurring underground CO_2 reservoirs, but may also be captured from point sources that emit CO_2 into the atmosphere during energy production, ethanol production, or industrial processes.

In recent years, Congress has debated various approaches to mitigating climate change, such as the role of carbon capture and sequestration (CCS) projects, including carbon injection and storage through EOR, in reducing atmospheric GHG emissions. The new GHGRP regulations and reported data may have implications for congressional oversight of climate change policy and other EPA activities.

Legislative and Regulatory History

The Consolidated Appropriations Act, 2008 (P.L. 110-161) provided $3.5 million for EPA to develop and publish a rule that would "require mandatory reporting of greenhouse gas emissions above appropriate thresholds in all sectors of the economy of the United States." In response to Congress's directive, EPA released a final rule, "Mandatory Reporting of Greenhouse Gases," which went into effect on December 29, 2009. In 2010, EPA amended the Reporting Rule and established new source categories for facilities undertaking CO_2 injection for geologic sequestration (codified at 40 C.F.R. Subpart RR) and CO_2 injection for purposes other than geologic sequestration (codified at Subpart UU).

In 2024, EPA promulgated regulations that created a new source category and new reporting requirements for certain facilities (i.e., *reporters*) injecting CO_2 for EOR, codified at Subpart VV. The regulations went into effect on January 1, 2025. If a facility is injecting CO_2 for EOR and uses CSA Group/American National Standards Institute (ANSI)/International Standard Organization (ISO) standard 27916.19, *Carbon dioxide capture, transportation and geological storage—Carbon dioxide storage using enhanced oil recovery (CO2-EOR)*, they are now required to report under Subpart VV, rather than the Subpart UU requirements that were in place. Alternatively, as with Subpart UU, these facilities have the option to report under Subpart RR, which could allow the facility to be eligible for different carbon sequestration tax credits. In the Subpart VV rulemaking, EPA explained that the agency created the new source category to improve tracking of CO_2 flow across all sectors of the economy and enhance the data collection and analysis used to develop agency policies on air quality and climate change.

Subpart VV Requirements

Subpart VV requirements share some similarities with requirements for other CO_2 injection purposes under Subpart UU and Subpart RR. For example, all three subparts require facility-specific annual reporting for covered GHGs and include source-specific methodologies for calculating and reporting emissions. Subpart VV and Subpart UU both require identification of the source of the CO_2 used for injection. As with Subpart UU and Subpart RR, EPA did not set a minimum reporting threshold for Subpart VV; a facility covered under Subpart VV is required to report to EPA, regardless of the amount of CO_2 injected or stored during EOR. In addition to these requirements, all facilities covered by the GHGRP must follow general data collection and reporting requirements (40 C.F.R. Part 98 Subpart A).

In Subpart VV, EPA established new requirements specific to CO_2 storage at facilities that inject CO_2 for EOR and follow the ANSI/ISO standard. For example, reporters must use the ANSI/ISO standard to quantify the amount of CO_2 stored using a mass balance equation, determined as the total mass of CO_2 received for injection minus the total mass of CO_2 lost from project operations and the mass of CO_2 lost from the overall EOR complex, which includes the project reservoir, trap, and surrounding subsurface. Under Subpart UU, CO_2-EOR facilities were only required to report the amount of CO_2 received for injection, not report the total mass of CO_2 lost or injected for sequestration. Subpart VV covered facilities must also conduct monitoring, quality assurance/quality control, quantification, and verification activities in compliance with the ANSI/ISO standard. Other requirements include a statement describing the data verification process, methodologies for considering missing or incomplete data, leak detection procedures, and reporting and recordkeeping procedures.

Under Subpart VV, EPA also requires reporters to submit an EOR management plan. The plan includes a geological characterization of the EOR complex, descriptions of project facilities and wells, and the operations history of the project reservoir, among other information. The regulations require covered reporters to submit the plan along with the information from the facility's first reporting year. No equivalent requirements exist for Subpart UU. Subpart RR facilities injecting CO_2 for geologic sequestration are subject to specific operation, maintenance, monitoring, reporting, and verification requirements.

In the Subpart VV rulemaking, EPA determined that all of the data elements required to be submitted under Subpart VV would be publicly available. In contrast, EPA had determined that data elements required to be submitted under Subpart UU are confidential business information. EPA makes confidentiality determinations for every data element collected under the GHGRP. Unless the agency determines the information is confidential business information, EPA will make the information available to the public and other stakeholders through an online database and EPA reports.

Covered Facilities

For the reporting year 2023, 81 facilities reported to EPA under Subpart UU, some of which now may be categorized within the Subpart VV source category. Thirty-four of these facilities are located in Texas and 14 are located in Wyoming, with additional facilities located in Arkansas, Colorado, Louisiana, Michigan, Mississippi, Montana, North Dakota, New Mexico, and Oklahoma. Each of these facilities typically operates multiple CO_2 injection wells, with some facilities operating hundreds of wells. For 2023, EOR facilities reported receiving a total of 26.7 million tons of CO_2 for EOR. EPA expects that the addition of Subpart VV will not expand the universe of covered facilities under the GHGRP, as Subpart VV covered facilities would include existing facilities injecting CO_2 for EOR operations that are already reporting under Subpart UU or Subpart RR.

Potential Impact on GHG Reporters

Facilities covered under Subpart VV are required to begin collecting data and monitoring EOR operations in 2025, to be submitted to EPA in 2026. After EPA collects and processes that data during 2026, more specific information will be available on the number of facilities reporting under Subpart VV and those that have shifted from reporting under Subpart UU. GHG data collection, calculations, and reporting activities may or may not change for EOR facilities, depending on the specific facility operations and whether or not a facility chooses to report under Subpart RR. Some of these facilities may have already been using the ANSI/ISO standard for calculating CO_2 storage, while others would have to adopt the methodologies and activities needed to meet Subpart VV requirements. Facilities that choose not to follow the ANSI/ISO standard, or that inject CO_2 for purposes other than EOR or geologic sequestration, would still be required to report under Subpart UU.

Issues for Congress

Congress could consider several policy issues when conducting oversight of EPA's implementation of the GHGRP and related CCS policy. Selected policy issues include overall CCS deployment in the United States and the role of EOR; data and information on GHG emissions; and data used to claim the federal tax credit for carbon sequestration, referred to as "Section 45Q." Currently, most of the CCS operations in the United States involve capturing CO_2 for use in EOR. Some Members and stakeholders support further deployment of CCS facilities and the use of EOR for incidental CO_2 storage. Other Members and stakeholders oppose CCS, or the use of EOR in CCS, arguing that these operations further the reliance on the combustion of fossil fuels, which release GHGs into the atmosphere and contribute to climate change.

The additional data collected on CO_2 injection and storage under Subpart VV also may be of interest to Congress as it considers policies and conducts oversight on a range of CCS-related issues. Emissions reporting requirements under Subpart VV are more rigorous and detailed than those under Subpart UU and are tailored specifically for facilities injecting CO_2 for EOR. In the April 2025 rulemaking, EPA stated that it intends to use this information to better track the overall flow of GHGs through various sources and carbon sinks throughout the United States as part of its understanding of overall U.S. GHG emissions. Over time, the CO_2 injection and storage data from facilities, along with the required EOR management plans, could also provide detailed information for policymakers, EPA, and other agencies such as the Department of Energy, on the use of CO_2 in the EOR as part of a CCS system. In 2023, EPA used GHGRP information on the availability of EOR and geological sequestration of CO_2 in identifying best systems of emission reductions for its 2024 New Source Performance Standards for Electric Generating Units.

Additional data on CO_2 injecting for EOR may help address some Member and stakeholder concerns regarding the accuracy of the reported amounts of CO_2 injected for sequestration under the federal tax credit for carbon sequestration. Measurement and verification of CO_2 for the Section 45Q tax credit has been a topic of congressional debate. Under Section 45Q, taxpayers can claim credit for the amount of CO_2 that is captured from a point source of CO_2 and then used and incidentally stored during EOR operations. While Congress has enacted policies expanding the tax credit in recent years, some Members have expressed concern that neither EPA nor the IRS have effective policies in place to independently verify the amounts of CO_2 being claimed for the tax credit. In 2021, the IRS promulgated regulations, which among other requirements, required that facilities claiming the tax credit for CO_2 stored during EOR operations must either comply with Subpart RR requirements or store and measure CO_2 in compliance with the same ANSI/ISO standard now required for Subpart VV. Congress could consider whether further measures are needed to address concerns regarding accuracy and validation for CO_2 storage and sequestration at EOR facilities.

Angela C. Jones, Analyst in Environmental Policy

IF12947

Disclaimer