



Updated February 21, 2020

Carbon Sequestration Legislation in the 116th Congress

Utilizing permanent underground storage of carbon dioxide (CO₂), also known as geological sequestration, as a potential strategy to reduce net greenhouse gas (GHG) emissions is receiving increasing congressional attention. Proponents of geological sequestration of CO₂ view the process as a promising method of reducing GHG emissions from stationary sources, such as coal-fired power plants, while continuing to use fossil fuels as a source of electricity. Several bills introduced in the 116th Congress would address geological sequestration policy issues, focusing on federal research and development (R&D) and federal tax credits for storing carbon.

Carbon Sequestration

Geological sequestration of CO₂, a type of carbon storage, is the process of storing CO₂ by injecting it into an underground geological formation. Geological sequestration is the final step in a carbon capture and storage (CCS) system—sometimes referred to more expansively as CCUS (carbon capture, utilization, and storage). Geological sequestration is intended to trap CO₂ emitted from anthropogenic sources permanently underground and reduce net emissions of this GHG into the atmosphere. CO₂ can also be stored underground when injected as part of oil and gas production (called enhanced oil recovery, or EOR).

In a CCS system, CO₂ is captured from a stationary source, compressed into a fluid to allow for transportation by pipeline, and then injected through specially designed wells into geological formations typically a half a mile or more below the Earth's surface. An emerging technology to capture CO₂ directly from the atmosphere—"direct air capture" (DAC)—could also serve as a source of CO₂ for geological sequestration. Subsurface geological formations across the United States could be suitable for large-scale sequestration of CO₂. These include, for example, deep saline reservoirs (underground basins containing salty fluids) and oil and gas reservoirs no longer in production. CO₂ may also be sequestered offshore in deep ocean waters or under the seabed. When injected deep enough underground, high pressures combined with impermeable rocks above the target formation are expected to keep the CO₂ from migrating upward into shallower groundwater or into other geological formations. For additional information on the technical aspects of CCS, see CRS Report R44902, *Carbon Capture and Sequestration (CCS) in the United States*, by Peter Folger.

Beyond Research and Development

Over the last decade, the focus of federal R&D efforts for geological sequestration has shifted from small

demonstration projects to exploring the use of sequestration as a technically and commercially viable method for storing large volumes of captured CO₂. The U.S. Department of Energy (DOE) leads the federal government's R&D efforts in geological sequestration of CO₂ as part of the agency's fossil fuel programs. DOE's work includes conducting fundamental laboratory research on wells, storage design, geological settings, and monitoring and assessment of the injected CO₂. DOE also sponsors numerous geological sequestration testing and validation projects through partnerships with the petroleum and chemical industries and public and private research institutions. To date in the United States, nine R&D projects have injected CO₂ into underground formations in large-scale field tests of permanent geological sequestration and storage associated with EOR. Four of these projects are currently injecting and/or storing CO₂.

CCS Legislation in the 116th Congress

Some Members of Congress have introduced legislation intended to support geological sequestration R&D. (See **Table 1** for a list of legislation introduced in the 116th Congress.) Several bills—S. 383/H.R. 1166, S. 1201, and H.R. 3607—would enhance DOE's work in supporting geological sequestration through continuation and/or expansion of its CCS programs, including carbon storage programs. These bills would amend current statutes to direct DOE to develop and implement R&D programs related to geological sequestration methods, storage siting, and assessment of potential impacts. S. 1201 and H.R. 3607 would also direct DOE to continue its partnership programs for large-scale sequestration demonstration projects. S. 383/H.R. 1166 and S. 1201 would require reports to Congress, such as a report from DOE on saline reservoir storage and a report from the Council on Environmental Quality on ways to facilitate development of CCS projects.

Legislation addressing federal tax credits for carbon storage is receiving significant industry attention. Two bills in the 116th Congress—H.R. 5883 and S. 2263—would address these tax credits (see **Table 1**). H.R. 5883 would increase the tax credit for DAC facilities, remove the deadline for beginning construction of a qualified facility, and reduce the amount of carbon oxide required to be captured by qualifying DAC facilities. S. 2263 would amend the federal tax code, Section 45Q, by changing what is considered "secure geological storage" of carbon oxide (a more general term covering CO₂ and other oxides) and set out eligibility requirements for tax credits for carbon oxide storage associated with EOR.

Table I. Carbon Sequestration Legislation Introduced in the 116th Congress

Bill Number	Short Title	Status	Short Summary of Major Carbon Sequestration Provisions
H.R. 1166	USE IT Act	Referred to House Subcommittees on the Environment; Environment and Climate Change; Highways and Transit, Energy and Mineral Resources; and Water, Oceans, and Wildlife	Would amend the Clean Air Act by directing the U.S. Environmental Protection Agency (EPA) to conduct certain carbon capture research activities. Would require the U.S. Department of Energy (DOE) to submit a report to Congress on the potential risks and benefits to project developers associated with increased storage of carbon dioxide (CO ₂) in deep saline formations and recommendations for federal policy changes to mitigate identified risks. Would direct the Council on Environmental Quality (CEQ) to prepare a report and issue guidance on development of carbon dioxide pipelines and storage projects.
H.R. 3607	Fossil Energy Research and Development Act of 2019	House Science, Space, and Technology Committee voted favorably for bill to be reported	Would amend the Energy Policy Act of 2005 to direct DOE to carry out a program of research, development, and demonstration for carbon capture and storage (CCS) and conduct large-scale carbon sequestration partnerships through the Regional Carbon Sequestration Partnerships.
H.R. 5883	[No bill title]	Referred to the House Committee on Ways and Means	Would amend the Internal Revenue Code Section 45Q to increase the tax credit for direct air capture (DAC) facilities, remove the deadline for beginning construction of a qualified facility, and reduce the amount of carbon oxide required to be captured by qualifying DAC facilities.
S. 383	USE IT Act	Written report from the Committee on Environment and Public Works filed in Senate ^a	Would amend the Clean Air Act by directing EPA to conduct certain carbon capture research activities. Would require DOE to submit a report to Congress on the potential risks and benefits to project developers associated with increased storage of CO ₂ in deep saline formations and recommendations for federal policy changes to mitigate identified risks. Would direct the CEQ to prepare a report and issue guidance on development of carbon dioxide pipelines and storage projects.
S. 1201	EFFECT Act	Placed on Senate Legislative Calendar	Would amend the Energy Policy Act of 2005 (P.L. 109-58) to direct DOE to carry out CCS research and development programs. Would require DOE to submit a report to Congress on CCS activities. Would establish an optional program to transition large-scale carbon sequestration demonstration projects into integrated commercial storage complexes.
S. 2263	CO ₂ Regulatory Certainty Act	Referred to Committee on Finance	Would amend the Internal Revenue Code, Section 45Q, to revise the requirements for the secure geological storage of carbon oxide for the purpose of the tax credits for permanent sequestration and enhanced oil recovery. Would require the Treasury Department to establish regulations setting out these requirements, including compliance with federal environmental statutes and regulations.

Source: Congress.gov and CRS analysis.

Notes: This In Focus outlines carbon storage through sequestration. These bills (and others) also encompass provisions that cover carbon capture and/or utilization.

- a. A version of S. 383 was incorporated into S. 1790, the National Defense Authorization Act for Fiscal Year 2020, which became law on December 20, 2019 (P.L. 116-92), and S. 2302, America's Transportation Infrastructure Act, which was reported in the Senate on January 8, 2020.

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