TAXPAYERS for COMMON SENSE

ISSUE BRIEF

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Hot Air and High Costs:
The Carbon Capture and Sequestration Credit

The federal carbon capture and sequestration (CCS) tax credit – often referred to as 45Q – can be claimed by qualified taxpayers for every metric ton of carbon oxide captured and sequestered that would have otherwise been released into the atmosphere. Congress created the credit in 2008 to jump start adoption of technologies that would reduce emissions from existing sources. In practice, companies have primarily claimed 45Q tax credits for pumping captured carbon oxides underground to increase oil production from aging wells, canceling out most of the emissions reduction benefit. Despite the credit's history of fraudulent claims, lawmakers recently expanded and extended the tax credit under the guise of combating climate change, with little assurance it will do more than line the pockets of special interests like oil and gas companies and the ethanol industry. It's time to reverse course on federal support for carbon capture and sequestration and, at a minimum, set up mechanisms to protect taxpayers from waste, fraud, and abuse.

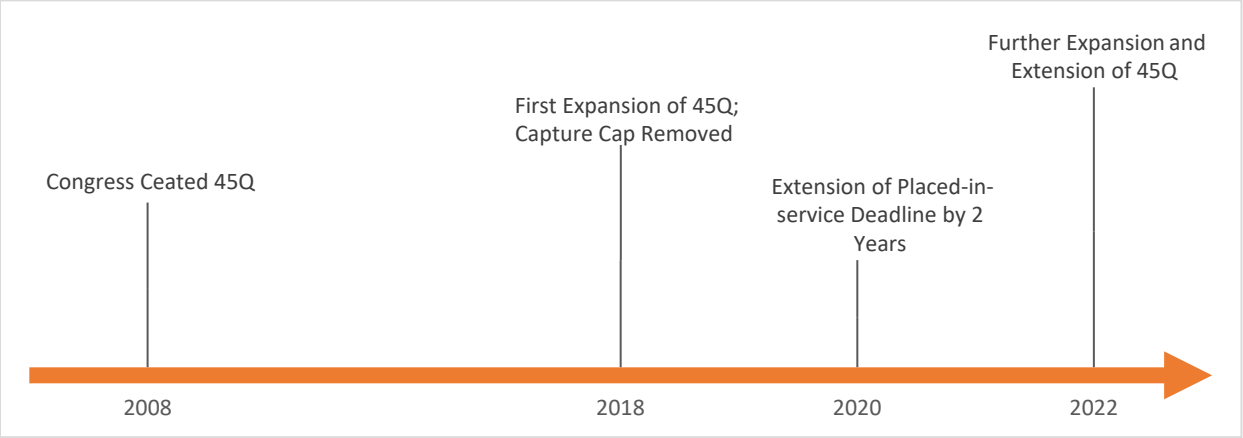
Coal-Fired Power Plant with Carbon Capture Tanks | Photo Credit: Envato Elements License, by jacksonnick

45Q Tax Credit History

Congress first created the 45Q credit, 26 U.S. Code § 45Q, in the Energy Improvement and Extension Act of 2008.[1] To target only early adopters of carbon capture technology, Congress set the credit to expire the year after the Internal Revenue Service (IRS) certifies that credits have been claimed for 75 million metric tons of carbon dioxide.[2] In June 2020, the IRS reported that 45Q credits had been claimed for 72 million metric tons, or 96% of the original limit. No update has been provided since.

In the Bipartisan Budget Act (BBA) of 2018,[3] Congress greatly expanded and extended the 45Q credit. Carbon oxides – not just carbon dioxide – captured by equipment placed in service after enactment of the BBA and before the start of 2024 can claim the credit for 12 years and are no longer subject to the 75-million-ton cap. The law also set the value of the credit to increase over time. In December 2020,[4] Congress extended the deadline for qualifying facilities to begin construction by two years to the start of 2026.

In the FY2022 Budget Reconciliation Bill, commonly referred to as the Inflation Reduction Act (IRA), the CCS tax credit was expanded again and extended to equipment for construction beginning before 2033. The IRA also allows certain taxpayers to elect to receive 45Q credits as a direct payment rather than as a credit against their federal income tax liabilities – which means companies can benefit from the lucrative credit regardless of tax liability – and allows for the transfer of credits.



How much credit any one facility can claim depends on how the captured carbon oxides are stored or used and when the facility was placed in service. For detailed credit amounts, see the chart below.[5]

[1] Division B of the Emergency Economic Stabilization Act of 2008 (P.L. 110-343)
[2] Prior to 2017, credits could only be claimed for CO_2. Now, the 45Q credit can be claimed for all carbon oxides. CO_2 is used throughout the text for simplification.
[3] Bipartisan Budget Act of 2018 (P.L. 115 – 123)
[4] Division EE of the Consolidated Appropriations Act of 2021 (P.L. 116 – 260)
[5] Congressional Research Service (CRS), "The Tax Credit for Carbon Sequestration (Section 45Q)," IF11455

45Q Credit for Qualifying Equipment			
	Equipment in Service 10/3/2008 – 2/9/18	**Equipment in Service 2/9/18 – 12/31/22**	**Equipment in Service 12/31/22 – Construction Begins Before 1/1/33**
Claim Period	Till Jan 1, 2023*	12 years	12 years
Credit Amount**			
Geologically Sequestered CO_2	$20	$17	$17 ($36 DAC***)
Geologically Sequestered CO_2 with Enhanced Oil Recovery	$10	$12	$12 ($26 DAC)
Other Qualified Use of CO_2	$10	$12	$12 ($26 DAC)
Credit Amount if prevailing wage & apprenticeship requirements are satisfied (multiply by 5)			
Geologically Sequestered CO_2	N/A	$85	$85 ($180 DAC)
Geologically Sequestered CO_2 with Enhanced Oil Recovery	N/A	$60	$60 ($130 DAC)
Other Qualified Use of CO_2	N/A	$60	$60 ($130 DAC)
Annual Capture Requirements	Capture ≥ 500,000 metric tons	Facilities that emit ≤ 500,000 metric tons per year: ≥ 25,000 metric tons. Power plants that emit > 500,000 metric tons: ≥ 500,000 metric tons. DAC and other capture facilities: ≥ 100,000 metric tons.	**Construction begins before 8/16/22:** Previous annual capture requirements apply. **Construction begins after 8/16/22:** Power Plants: ≥ 18,750 metric tons AND ≥ 75% baseline carbon oxide production. Other Facilities: ≥ 12,500 metric tons. Direct Air Capture: ≥ 1,000 metric tons.

* The Inflation Reduction Act provided that pre-BBA 45Q credit would not be available at the earlier of 1) January 1, 2023, or 2) the end of the calendar year when the IRS certifies that the 75 million metric tons cap has been met. In September 2022, the IRS announced that, for equipment placed in service before the Bipartisan Budget Act of 2018 (BBA), 2022 will be the final year to claim the 45Q credit.[6]
**For equipment placed in service pre-BBA, the credit amount is adjusted for inflation annually. For equipment placed in service after BBA, the credit amount will be adjusted for inflation starting in 2027 and indexed to base year 2025.
*** DAC stands for Direct Air Capture.

[6] Internal Revenue Service, Internal Revenue Bulletin, IRB-2022-39, https://www.irs.gov/pub/irs-irbs/irb22-39.pdf

Credit Recipients and Activities

When Congress created the 45Q tax credit in 2008, many policymakers envisioned that carbon capture technology would be used to reduce greenhouse gas emissions from coal-fired power plants. That vision has not materialized. Several projects along those lines were announced, but almost all were eventually cancelled. The high-profile Kemper County plant in Mississippi, for example, cancelled the coal gasification and carbon capture component of its plans after cost estimates to complete it increased by billions of dollars.[7] The Petra Nova project in Texas began capturing carbon from a coal-fired generating unit in 2017 but shut down in 2020 due to economic challenges.[8] Despite these failures, the Department of Energy will provide more subsidies for the research, development, and deployment of CCS projects at industrial facilities that emit CO_2. Projects associated with ethanol, cement, and chemical production may qualify for future CCS subsidies under the extended and expanded 45Q tax credit. Several multibillion-dollar pipeline projects have been proposed to capture CO_2 at ethanol, fertilizer, and other industrial agriculture facilities in the Midwest.[9]

Although the 45Q tax credit is more lucrative for companies that directly sequester captured carbon underground, most companies choose instead to sell their carbon oxides to oil and gas producers who pump the carbon oxides underground to free oil and gas from rock formations and increase their wells' output, a process known as enhanced oil recovery (EOR). Of the 12 commercial carbon capture projects in the United States as of 2020, only one sequesters captured carbon in an underground sandstone formation and 11 are capturing and injecting CO_2 for enhanced oil recovery.[10] The Congressional Research Service notes that in the near term, most CCS projects will continue to be for EOR because the revenue generated from the production of oil is needed to make carbon capture commercially viable.[11]

It is still unknown if using captured carbon oxides for EOR results in a net reduction in emissions. Recent papers suggest that most EOR projects using captured CO_2 initially have a negative carbon footprint (net emissions reduction) because a high portion of the CO_2 pumped underground becomes trapped. But as projects continue, increasingly less CO_2 is trapped underground, and the carbon footprint becomes positive (no net emission reduction).[12] This raises serious questions about the efficacy of handing out billions of dollars in 45Q credits for carbon captured and used for EOR.

Further undermining the credit's net effect on emissions is insufficient reporting on the amount of carbon being pumped underground. In April 2020, the Treasury Department's Inspector General for Tax

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[7] E&E News, "The Kemper project just collapsed. What it signifies for CCS," Oct 26, 2021. https://www.eenews.net/articles/the-kemper-project-just-collapsed-what-it-signifies-for-ccs/

[8] Reuters, "Problems plagued U.S. CO2 capture project before shutdown: document," Aug 6, 2020. https://www.reuters.com/article/us-usa-energy-carbon-capture/problems-plagued-u-s-co2-capture-project-before-shutdown-document-idUSKCN2523K8

[9] Des Moines Register, "What we know about three carbon capture pipelines proposed in Iowa," Nov 28, 2021. https://www.desmoinesregister.com/story/money/business/2021/11/28/what-is-carbon-capture-pipeline-proposals-iowa-ag-ethanol-emissions/8717904002/

[10] Global CCS Institute, "Global Status of CCS 2020," Dec 1, 2020. https://www.globalccsinstitute.com/wp-content/uploads/2021/03/Global-Status-of-CCS-Report-English.pdf

[11] Congressional Research Service (CRS), "The Tax Credit for Carbon Sequestration (Section 45Q)," IF11455

[12] Núñez-López and Moskal, "Potential of CO2-EOR for Near-Term Decarbonization," Frontiers in Climate., Sept 27, 2019. https://doi.org/10.3389/fclim.2019.00005; Sekera, J. & Lichtenberger, A. (2020) Assessing Carbon Capture: Public Policy, Science, and Societal Need: A Review of the Literature on Industrial Carbon Removal. Biophysical Economics and Sustainability. Available: https://link.springer.com/article/10.1007/s41247-020-00080-5

Administration (TIGTA) found that 10 taxpayers claimed over $1 billion in 45Q tax credits from 2010 to 2019, roughly 99 percent of total credits claimed. Of the total $1 billion claimed, credits worth $894 million did not comply with Environmental Protection Agency (EPA) requirements for reporting on sequestered carbon.[13] The companies had insufficiently documented whether the carbon for which they were claiming credits remained underground. The IRS has reported on their examination of 68% of these cases and has disallowed 59% of the noncompliant credits, worth approximately $531 million. No further update has been released since April 2020.

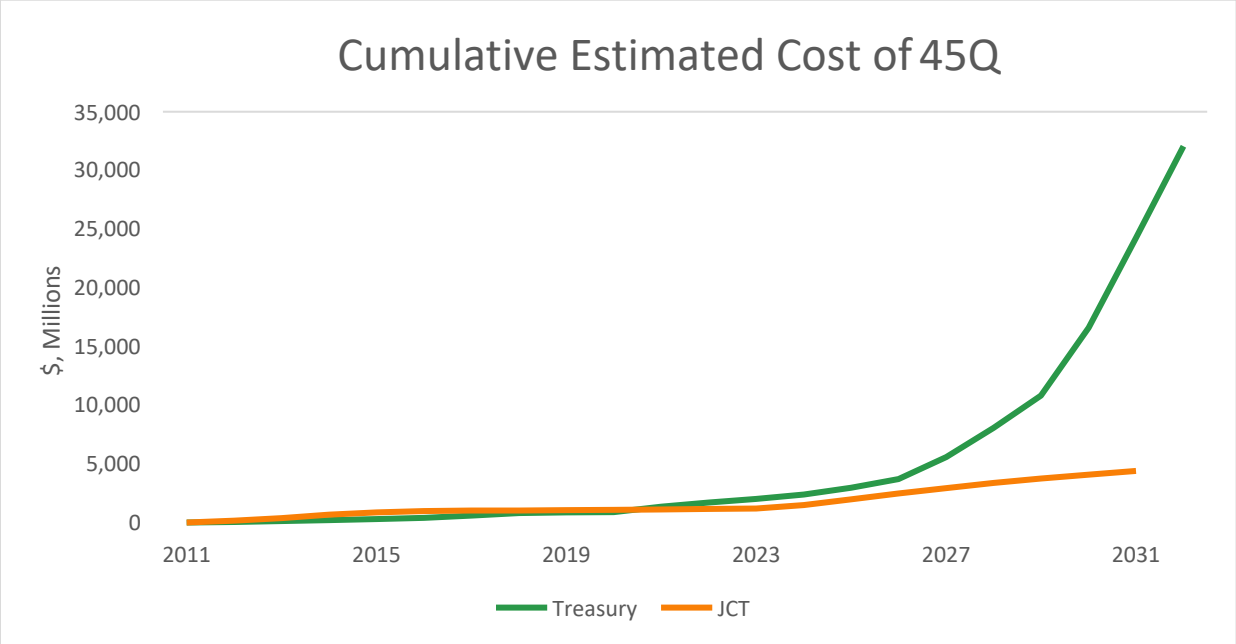
Taxpayer Costs of the 45Q Credit

Still an unproven climate solution, commercially unviable and mired in its history of tax fraud, CCS also comes at a high cost to taxpayers. When 45Q was first created in 2008, the Joint Committee on Taxation (JCT) estimated the CCS tax credit would cost taxpayers $1.12 billion in lost revenue.[14] This estimate was fairly accurate, as TIGTA found during their 45Q fraud investigation in April 2020, over $1 billion worth of credits have been claimed. And the IRS certified in June 2020 that 96% of the 75-million tons have been claimed, nearing the limit of how much carbon was to be sequestered through the tax credit.

When the Bipartisan Budget Act (BBA) of 2018 removed the 75-million-ton cap and expanded the credit, JCT estimated the expansion would cost an additional $680 million over 10 years, from FY2018 to FY2027. When Congress extended the deadline for qualifying facilities to begin construction by two more years in the Consolidated Appropriations Act of 2021,[15] JCT estimated that the extension would cost $641 million from FY2021 to FY2030. JCT estimates the latest expansion will cost taxpayers an additional $3.2 billion over the next decade.[16] However, the real cost will be higher because facilities can claim credits for years after the period covered in JCT's cost estimate, so long as construction begins before 2033.

However, the Treasury Department produced drastically different cost estimates of the 45Q credit, reflecting the wildly different assumptions about the industry's readiness to take advantage of these credits and the commercial viability of CCS technologies. In 2021, after the 45Q credit was extended for two more years in the Consolidated Appropriations Act of 2021, the Treasury Department put the estimated cost of the credit at $20.1 billion from FY2021-FY2031[17] – more than double Treasury's previous estimate[18] and far higher than the JCT estimate of $641 million for FY2021-FY2030. And just one year later, in 2022, the Treasury Department's estimate jumped to $30.3 billion.[19] This cost estimate does not even include the most recent expansion of the credit by IRA.

[13] Inspector General for Tax Administration, April 15, 2020. https://www.menendez.senate.gov/imo/media/doc/TIGTA%20IRC%2045Q%20Response%20Letter%20FINAL%2004-15-2020.pdf
[14] Joint Committee on Taxation, "Estimated Budget Effects of The Tax Provisions Contained In An Amendment In The Nature Of A Substitute To H.R. 1424", JCX-78-08
[15] Division EE of the Consolidated Appropriations Act of 2021 (P.L. 116 – 260)
[16] Congressional Budget Office (CBO), "Estimated Budgetary Effects of Public Law 117-169," https://www.cbo.gov/system/files/2022-09/PL117-169_9-7-22.pdf
[17] U.S. Treasury Department, "Tax Expenditures – FY23," https://home.treasury.gov/system/files/131/Tax-Expenditures-FY2023.pdf
[18] U.S. Treasury Department, "Tax Expenditures – FY22," https://home.treasury.gov/system/files/131/Tax-Expenditures-FY2022.pdf
[19] U.S. Treasury Department, "Tax Expenditures – FY24," https://home.treasury.gov/system/files/131/Tax-Expenditures-FY2024-update.pdf



The lower cost estimate reflects JCT's assumption that carbon capture technologies will not be in a position to be widely deployed in the 10-year window, which brings into question their ability to impact emissions in the short -term. On the other hand, the higher cost estimate reflects Treasury's assumption that industries will take advantage of the tax credit, but at a steep cost to taxpayers.

Conclusion

The carbon capture and sequestration tax credit has already cost taxpayers hundreds of millions of dollars while failing to serve as an effective tool for greenhouse gas emission reduction. Policymakers should not waste billions of additional tax dollars by extending and expanding tax credits for capturing carbon. Instead of a CCS tax credit, which has been susceptible to fraud and largely used to extract more oil, policymakers should pursue more effective and fiscally responsible climate solutions to reduce greenhouse gas emissions and mitigate the effects of climate change. At the very least they should proceed with extreme caution in handing out the 45Q tax credit.

Kemper County Energy Facility| Photo Credit: Department of Energy