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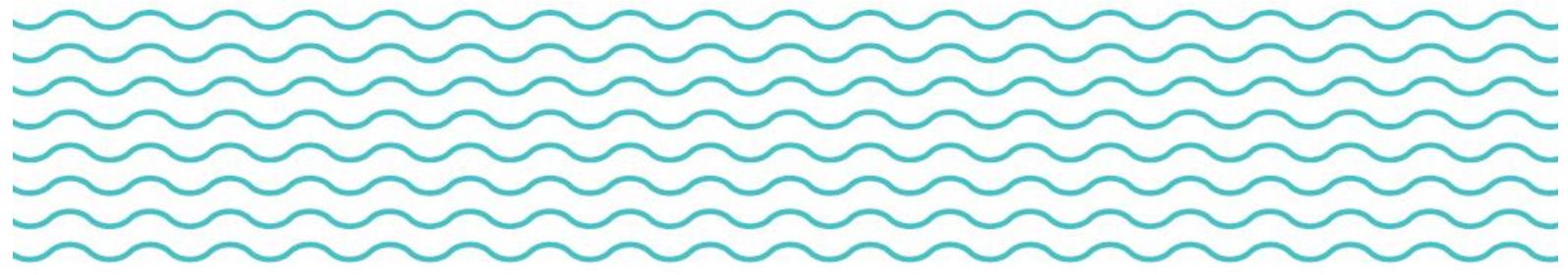
## Brief

# The US Section 45Q Tax Credit for Carbon Oxide Sequestration: An Update

Global CCS Institute

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April 2020



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# 1. Introduction

This brief is intended for carbon capture and storage (CCS), climate and clean energy advocates, policymakers and projects developers globally and focuses on the latest developments with regards to the 45Q tax credit for carbon oxide sequestration<sup>i</sup> in the US, including a summary of the guidance released so far.

The US has a long history<sup>ii</sup> of providing energy tax credits to a variety of fuels and production methods. In the context of clean energy deployment, tax credits have become the preferred incentive structure by the federal government to spur the deployment of and unlock investment in clean energy. Examples include tax credits for energy efficiency investments, the federal Investment Tax Credit (ITC) for solar energy and the Production Tax Credit (PTC) for wind, all of which have delivered large amounts of renewable energy capacity. With the ability to claim tax credits depending on a clean energy developer’s being profitable enough to owe taxes, a market for financing clean energy has developed through these tax credits. Such tax equity partnerships allow a developer who is unable to claim the credits to secure financing by partnering with an investor – a tax equity investor.

## 1.1 45Q: The most progressive CCS-specific incentive globally

The carbon oxide sequestration credit – 45Q – named after the relevant section in the US tax code, is applicable to carbon dioxide (CO<sub>2</sub>), carbon monoxide, and carbon suboxide. It provides a certain amount of monetary credit for carbon oxide that is permanently stored via usage, tertiary oil injection, or in geologic formations. 45Q was first enacted in 2008, originally providing \$10/tCO<sub>2</sub> stored via enhanced oil recovery (EOR) and \$20/tCO<sub>2</sub> stored in geologic formations<sup>iii</sup>.

In 2018, 45Q was reformed as part of the Bipartisan Budget Act, broadening eligibility to further industries and applications through lowering the annual CO<sub>2</sub> capture minimum, increasing its value and providing greater flexibility for entities to claim the credit. Projects will be able to eventually receive \$50/t CO<sub>2</sub> for geologic storage and \$35/tCO<sub>2</sub> for enhanced oil recovery<sup>iv</sup>.

TYPE OF CO <sub>2</sub> STORAGE/USE	MINIMUM SIZE OF ELIGIBLE CARBON CAPTURE PLANT BY SIZE (KtCO <sub>2</sub> /YR)			RELEVANT LEVEL OF TAX CREDIT GIVEN IN OPERATIONAL YEAR (USD/tCO <sub>2</sub> )									
	POWER PLANT	OTHER INDUSTRIAL FACILITY	DIRECT AIR CAPTURE	2018	2019	2020	2021	2022	2023	2024	2025	2026	LATER
DEDICATED GEOLOGICAL STORAGE	500	100	100	28	31	34	36	39	42	45	47	50	
STORAGE VIA EOR	500	100	100	17	19	22	24	26	28	31	33	35	INDEX LINKED
OTHER UTILISATION PROCESSES*	25	25	25	17	19	22	24	26	28	31	33	35	

\*Each CO<sub>2</sub> source cannot be greater than 500 ktCO<sub>2</sub>/yr. Any credit will only apply to the portion of the converted CO<sub>2</sub> that can be shown to reduce overall emissions.

45Q is regarded the most progressive CCS-specific incentive by many. It provides a stable and predictable value on carbon reflecting the externalities created by



pollution. Through introducing a defined time frame with clear sets of guidelines once the full Internal Revenue Service (IRS) guidance is published, 45Q has the advantage that it is not subject to the same potential volatility of carbon markets or carbon trading mechanisms. At the same time, the value is high enough to be able to incentivize CCS applications in a variety of energy-intensive sectors in industry. Currently, break-even cost estimates range between \$5 t/CO<sub>2</sub> for natural-gas processing CCS facilities to \$30t/CO<sub>2</sub> for hydrogen production and coal-to-chemicals processing, as well as \$60 t/CO<sub>2</sub> for power plants equipped with CCS<sup>v</sup>.

Furthermore, 45Q provides a federal tax credit that supplements, and can be combined with, state and local clean energy incentives including but not limited to the California Low Carbon Fuel Standard CCS protocol<sup>vi</sup>. This incentive currently provides close to \$200/tCO<sub>2</sub><sup>vii</sup> for CCS facilities that reduce the lifecycle emissions of transportation fuels, as well as direct air capture, recognizing that CO<sub>2</sub> emissions are a global problem. Other examples of policies that can work in tandem with 45Q are clean energy standards and local investment tax credits<sup>viii</sup>, as well as a variety of grant and loan programs.

So far, 45Q has already led to a series of project announcements. In fact, in late 2019, the Global CCS Institute updated its CO<sub>2</sub>RE database adding eight projects in the United States, with four citing the presence of 45Q as the key driver and another round of updates with further facilities which have been announced since then expected to be added within the next few weeks<sup>ix</sup>. This brings the total facilities in the US to 19 – 10 operating, and nine in various stages of development, potentially doubling the current CO<sub>2</sub> capture and storage capacity. Research by the Clean Air Task Force<sup>x</sup> has also shown that 45Q has the ability to unlock 49 million tonnes per annum (mtpa) of CO<sub>2</sub> being captured and stored by 2030 in the power sector alone.

On May 20, 2019, the IRS requested comments<sup>xi</sup> on issues concerning the implementation of the 45Q tax credit. In February 2020, the IRS released two parts of the full the guidance needed; the commencement of construction<sup>xii1</sup> and the revenue procedure<sup>2xiii</sup>. Stakeholders have welcomed the guidance that has been provided so far, but also warn that the continued delay of full guidance remains a source of uncertainty delaying final investment decisions.

## 2. The Guidance: Commencing Construction

To be eligible for the reformed 45Q tax credit, CCS facilities have to be under construction by January 1, 2024. As such, the construction of the actual carbon capture equipment needs to start before this date or the original planning and design of the facility includes installation of carbon capture equipment. For the purposes of the 45Q tax credit, property is considered to be placed in service in the taxable year that the property is placed in a condition or state of readiness and availability to store CO<sub>2</sub>. The construction guidance is modeled after guidance provided to other clean energy industries such as solar and wind<sup>xiv</sup>. The notice issued by the IRS provides two tests to assess compliance with the beginning of construction method; the Physical Work Test and the Five Percent Safe Harbor. Construction will be

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<sup>1</sup> Full Guidance: <https://www.irs.gov/pub/irs-drop/n-20-12.pdf>

<sup>2</sup> Full Guidance: <https://www.irs.gov/pub/irs-drop/rp-20-12.pdf>



determined as begun on the date the taxpayer first satisfies one of the two methods.

## **2.1 The Physical Work Test**

The Physical Work Test requires that the entity aiming to claim 45Q, commences physical work of *significant nature*. This assessment focuses on the type of work performed, not the cost or amount, and both off-site and on-site work can be taken into account. Off-site work of significant nature usually involves the manufacturing of components of the CCS-process that are not part of existing inventory, while on-site work can include building the foundations and installing CCS-equipment. Physical work does not include preliminary work such as securing financing, research or exploration. The guidance also provides multiple examples of physical work.

## **2.2 Five Percent Safe Harbor**

To meet this test the taxpayer must pay or incur five percent or more of the total cost of the CCS facility. The guidance provides special instructions in case of cost overruns. For retrofits, the cost of the additional equipment is counted.

## **2.3 Continuity Requirements**

To be eligible to receive 45Q upon completion, the commencement of construction tests must be satisfied continuously. For the physical work test, the physical work must be continued to satisfy the continuity requirement.

With regards to continuity of safe harbor, the ‘continuous efforts test’ takes into account individual circumstances but can include for example incurring additional costs, entering into binding and written contracts, obtaining necessary permits, and performing physical work of significant nature. If a facility is placed in service within six years from construction commencing, it will be considered having satisfied the continuity requirement. If it is placed in service after six years, the individual circumstances will be taken into account. There are, however, certain excusable disruptions, such as labor shortages, extreme weather events, delays in financing, due to the presence of endangered species, obtaining permits, due to natural disasters, in the manufacturing of custom components. A more comprehensive list is provided in the guidance.

# **3. The Guidance: Partnership Structures**

The second part of the guidance describes partnership flip structures. The tax credit is meant for and to be claimed by the taxpayer who owns and operates the CCS equipment. However, as described above, clean energy tax credits have traditionally provided alternative financing mechanisms through partnerships and investors.

The guidance provided stipulates that an investor can be defined as an owner and thus is entitled to be allocated section 45Q tax credits. To be considered an owner certain conditions must be fulfilled, which are summarized below. With regards to the share of ownership the document provides the following insight: If the sequestration



generates revenue, then 45Q can be allocated according to the same share as the revenue. If the sequestration does not generate any revenue, the credits can be allocated proportionally according to a partner's deduction or loss associated with the cost of CCS.

Developers must

- maintain 1 percent interest in each material item of the partnership such as income, gain, loss, deduction and credit. Developers are not allowed to lend any capital to investors for the purpose of securing a stake in the project.
- maintain a 20 percent minimum capital investment, of that more than 50 percent must be fixed and determinable and as such only 50 percent of investment is allowed to be contingent. Contributions to shoulder ongoing project expenses will not be treated as contingent payments.

Investors must

- maintain a 5 percent minimum interest in each material item
- make a bona fide equity investment, fulfilling a series of conditions
- not be limited in their exposure to losses or returns.

Neither developers nor investors have the right to purchase the CCS equipment or another partner's interest in the project via a future call option. Furthermore, investors are not allowed to require anyone to purchase partnership interest at a price higher than the fair market value in the future, which means that there is also no put option.

While the project company cannot provide any guarantees for investors to claim the 45Q tax credits, guarantees are allowed under the following circumstances:

- Guaranteeing the performance of CO<sub>2</sub> storage or any other acts necessary to claim the credit
- Guarantees for the case the project company fails to qualify for the credit.

## 4. Remaining Guidance

While the first two parts of the 45Q guidance has been issued, those are considered the most straightforward parts of the overall guidance needed. Further parts that are expected to be released include a lifecycle analysis for CO<sub>2</sub> utilization, defining recapture, and what constitutes safe geologic storage. These parts of the guidance are largely seen as more complicated and potentially controversial. Hence, the fact that there are still parts missing continue the uncertainty for developers and investors.

## 5. Proposed changes to 45Q by stakeholders <sup>xv</sup>

While continuing to ask the Treasury Department for a full release of guidance on how to claim the 45Q tax credit, stakeholders have also proposed a variety of adjustments and changes to the credit. The most vocal has been a delay in the commencement of construction deadline by at least two years, to recapture the two years and counting lost while waiting for the guidance. However, provided recent economic circumstances, some advocates have proposed to postpone the deadline



and extend the 45Q tax credit by five years to allow companies and developers more time to finalize project planning and investment decision amidst current uncertainty and market volatility.

In addition, advocates have also proposed a direct pay mechanism arguing that it would enable more facilities to access the credit directly and circumvent tax equity markets which are currently satisfied, according to advocacy groups. To further expand the pool of available tax equity investors, interest groups have also suggested to prevent the disallowance of 45Q under the Base Erosion and Anti-Abuse Tax (BEAT), which is an alternative minimum tax.

## 6. Conclusion

While 45Q is largely considered the most progressive CCS-specific incentive globally, its ability to fully unlock vast emissions and technology cost reductions while propelling the large-scale deployment of CCS depends on the full guidance of how to claim the credit. While two parts - largely considered the most straightforward and uncontroversial given expected similarities to other clean energy tax credits – have already been issued, further clarifications have yet to be issued.

*This brief will be updated with the remaining guidance once it has been issued.*

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<sup>i</sup> Cornell. US Code. 2020. <https://www.law.cornell.edu/uscode/text/26/45Q>

<sup>ii</sup> Congressional Research Service. Energy Tax Policy: History and Current Issues. 2008. <https://fas.org/sgp/crs/misc/RL33578.pdf>

<sup>iii</sup> Carbon Capture Coalition. 45Q tax credit. 2018. <https://carboncapturecoalition.org/45q-legislation/>

<sup>iv</sup> Global CCS Institute. Global Status of CCS. Global CCS Institute. 2019.

<sup>v</sup> IEA. *Transforming Industry through CCUS*. International Energy Agency. 2019

<sup>vi</sup> Havercroft, I & Townsend, A. *The LCFS and CCS Protocol: A Guide for Policymakers and Project Developers*. 2019. Global CCS Institute. [https://www.globalccsinstitute.com/wp-content/uploads/2019/05/LCFS-and-CCS-Protocol\\_digital\\_version-2.pdf](https://www.globalccsinstitute.com/wp-content/uploads/2019/05/LCFS-and-CCS-Protocol_digital_version-2.pdf)

<sup>vii</sup> California Air Resources Board. *Weekly Credit Reports*. 2020.

<https://ww3.arb.ca.gov/fuels/lcfs/credit/lrtweeklycreditreports.html>

<sup>viii</sup> Beck, L. Carbon capture and storage in the USA: the role of US innovation leadership in climate-technology commercialization, *Clean Energy*, , zkz031, <https://doi.org/10.1093/ce/zkz031>

<sup>ix</sup> Global CCS Institute. CO2RE. 2020. [Co2re.co](https://www.co2re.co)

<sup>x</sup> Nagabhushan, D. & Thompson, J. Carbon Capture and Storage in the United States Power Sector: The Impact of 45Q Tax Credits. <https://www.catf.us/2019/02/catf-releases-modeling-study-45q-carbon-capture/>

<sup>xi</sup> Department of the Treasury. Credit for Carbon Oxide Sequestration ; Request for Comments ( Notice 2019-32 ). 2019. <https://www.regulations.gov/docket?D=IRS-2019-0026>

<sup>xii</sup> Full Guidance: <https://www.irs.gov/pub/irs-drop/n-20-12.pdf>

<sup>xiii</sup> Full Guidance: <https://www.irs.gov/pub/irs-drop/rp-20-12.pdf>

<sup>xiv</sup> Huffman, A. & Sensoli, A. New IRS Guidance on Section 45Q Carbon Capture and Sequestration Tax Credits: Key Preliminary Takeaways for Potential Market Participants. *The National Law Review*. 2020. <https://www.natlawreview.com/article/new-irs-guidance-section-45q-carbon-capture-and-sequestration-tax-credits-key>

<sup>xv</sup> The Global CCS Institute does not endorse nor reject any of the proposed changes. This is merely a summary of recent events.

