

## 45Q: Carbon Capture & Tax Credits

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Today, there are over 35 commercial-scale ethanol production, carbon capture projects under development or construction in the United States (U.S.), with most of these announced in the past 24 months. This recent push has been driven mainly by the 45Q Tax Credit as developers look to capture attractive government incentives. Yet, the 45Q Tax Credit has been around for over 10+ years, so what has changed and what does the future hold?

### History of the 45Q Tax Credit

Originally enacted in 2008, the 45Q Tax Credit incentivizes U.S. taxpayers to capture and store CO<sub>2</sub> to reduce emissions. At inception, credits could only be claimed by the first 75 million MT of CO<sub>2</sub> that was either geologically stored (\$20/MT) or used in enhanced oil recovery (\$10/MT). In addition, the internal revenue code specified a minimum amount of captured CO<sub>2</sub>/year to claim any credits. Given all the limitations imposed, the 45Q was largely considered unsuccessful. In fact, in 2020 the Inspector General noted that just ten taxpayers claimed 99.9% of all credits under 45Q from 2010-2019.

**Figure 1: TY 2010 – 2019 Taxpayers Who Claimed §45Q Credits**

Range of Total Credits Claimed	# of Taxpayers	Percent of Taxpayers	Credits Claimed	% of Credits Claimed
<b>\$0-\$1,000</b>	592	88.10%	\$39,656	0.00%
<b>\$1,000-\$10,000</b>	56	8.33%	\$212,749	0.02%
<b>\$10,000-\$1 million</b>	14	2.08%	\$1,213,397	0.12%
<b>Over \$1 million</b>	10	1.49%	\$1,024,900,044	99.86%
<b>Total</b>	<b>672</b>	<b>100.00%</b>	<b>\$1,026,365,846</b>	<b>100.00%</b>

Source: Business Returns Transaction File data as of February 13, 2020.

Given these issues, Congress passed the Bipartisan Budget Act of 2018 that included the following amendments to the 45Q code:

- Eliminated 75 million MT cap
- Increased the credit amount (\$50/MT Geological Storage & \$35/MT CO<sub>2</sub>-EOR)
- Allowed for tax credits to be claimed for 12 years after the equipment is installed (before 2024)
- Expanded coverage to both carbon dioxide and carbon oxide
- Lowered threshold of captured CO<sub>2</sub>/year to claim any credits

In recent years, the IRS has issued guidance documents that addressed several key questions on how the code can be implemented and credits received. Then in late 2020, the 45Q deadline to begin construction by 2024 was extended by two years to 2026. The combination of published guidance and enhancements of the 45Q code established a clear pathway for investors and developers to confidently execute projects which helped spark the recent wave.

## 45Q Legislative Amendments

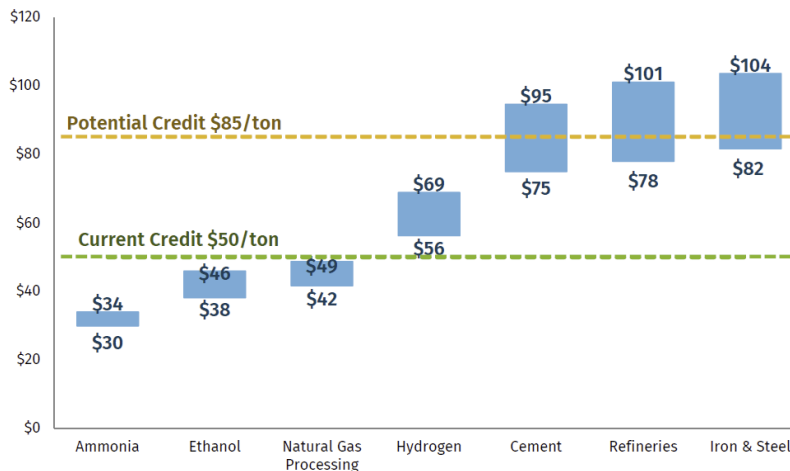
That brings us to today where the 45Q, among various carbon policies, is currently being debated and drafted before the 117th Congress to further enhance and set up the tax credit for success. Here are the major amendments that could potentially go through:

- Increase credit values
- Eliminate all minimum thresholds
- Extend commence construction window to 2031
- Create Direct-Pay for project developers
- Federal support of CO2 transport infrastructure

A lot of focus has been put on increasing the credit values but structuring the credits as direct-pay could be just as pivotal. According to the current draft of the proposal, *“rather than opting to carry forward credits to years when their credits can offset their tax liability, taxpayers can request a refund for the deemed payment of tax upon completion of construction.”* As it currently stands, companies with little to no tax liabilities are unable to fully capitalize on the tax credits. So instead, as with other sectors of the renewable energy industry, projects employ business models such as partnership flips that require tax-equity investors. Eliminating this need could lower the cost of capital and streamline the entire investment process, especially where developers cannot secure investors for their projects.

The increase in credit values may not be necessary for Ethanol plant CCUS projects to continue to develop, but it will certainly be required for facilities with low CO2 purity streams (i.e., refineries, cement, iron & steel). This past April, Rodium Group conducted a study showing the cost to implement carbon capture at various industrial facilities:

**Figure 2: Per-ton credit for a carbon capture retrofit at facilities**



Source: Rhodium Group analysis

## Carbon Capture Project Development

Should the current drafts of the 45Q amendments succeed, the industry will undoubtedly see a surge of projects. Deployment at refineries could gain traction with a focus on units like the FCC that can make up 50% of the entire CO<sub>2</sub> emissions at a facility. SVP of ExxonMobil, Neil Chapman recently said, “*In that \$100/ton range, you would make a very, very significant impact, particularly where the heavy industry is in places like the Gulf Coast.*” In addition, we may see more projects like the Valero Port Arthur Hydrogen SMR plant that utilizes pre-combustion carbon capture technology and sends the CO<sub>2</sub> for use in EOR. While projects that can combine credits from California’s Low Carbon Fuel Standard in addition to the 45Q credits may be the most lucrative if done strategically and evaluated appropriately.

## BTC and SAF Tax Credits

Also worth mentioning in the latest draft of the budget reconciliation bill is the extension of the Blenders’ Tax Credit (BTC) and the creation of a Sustainable Aviation Fuel (SAF) blending credit.

**Biodiesel BTC:** *The provision extends the income and excise tax credits for biodiesel and biodiesel mixtures at \$1.00 per gallon through 2031.*

**SAF Credit:** *Beginning in 2023, this provision provides a refundable blenders tax credit for each gallon of sustainable aviation fuel sold as part of a qualified fuel mixture. The value of the credit is determined on a sliding scale, equal to \$1.25 plus an additional \$.01 for each percentage point by which the lifecycle emissions reduction of such fuel exceeds 50%.*

However, it should be noted that the SAF Credit language would effectively exclude SAF derived from hydrotreated soybean oil. Under CORSIA ICAO, this pathway has a carbon intensity of 64.9 gCO<sub>2</sub>e/MJ which would not qualify as a 50% reduction compared to the default value of 89 gCO<sub>2</sub>e/MJ for jet fuel. This would be a big loss for facilities in the U.S. that rely heavily on soybean oil as a feedstock.

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