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**FINANCIAL INCENTIVES FOR CARBON CAPTURE, USE AND SEQUESTRATION**

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**The Updated Section 45Q Tax Credit Program**

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**Guardian of the Galaxy? The Section 45Q Carbon Capture Tax Credit**

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\* The author, a partner in the New York office of Orrick, gratefully acknowledges the thoughtful comments of Joshua Emmett, an associate in the New York office of Orrick in connection with this outline.

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## FINANCIAL INCENTIVES FOR CARBON CAPTURE AND SEQUESTRATION

### I. Background.

While the fossil fuel industry continues to enjoy a number of tax incentives, a new generation of tax incentives were enacted in the early 2000s to promote the use of renewable energy. These include the expansion of the investment tax credit to include construction of solar energy generating facilities and enactment of the so-called production tax credit, which encourages the use of wind to generate energy.

Another provision that was first enacted in 2008 is Section 45Q (or “§ 45Q”), which provides a credit for facilities that capture carbon, use it in a number of favored ways and then dispose of it in a secured geological site. As first enacted, § 45Q had a number of drawbacks, the most significant of which was that the number of tons of captured carbon dioxide that benefit from the credit was capped. This limited the willingness of investors to embrace the technology. Instead, investors were willing to embrace other green, tax-favored investments, particularly solar and wind projects.

The situation changed in 2018 when the § 45Q program was dramatically expanded. In fact, with the diminution of both the solar energy tax credit and the production tax credit in the coming years, § 45Q will likely attract the investment dollars in Carbon Capture, Use and Sequestration (“CCUS”) projects that have historically focused on these two areas.

CCUS has enjoyed significant legislative support. In 2019 to 2020, there were numerous legislative proposals that would have enhanced the credit and would have provided other incentives. The

Consolidated Appropriations Act, 2021, contains a number of provisions that will continue the development of CCUS. This includes increased funding for DOE’s Fossil Energy Research and Development program, which is responsible for CCUS research, development, and deployment. The Consolidated Appropriations Act also includes the USE IT Act, which provides for accelerated permitting processes for carbon dioxide pipelines, as well as increased funding authorizations for direct air capture and carbon dioxide utilization RD&D. It also extends the deadline for the beginning of construction of CCUS facilities from the end of 2023 to the end of 2025. This will be discussed below.

This outline will review the incentive provided by § 45Q. An overview of state incentives is available in “Review of Federal, State, and Regional Tax Strategies and Opportunities for CO<sub>2</sub>-EOR Storage and CCUS Value Chain” at the United States Energy Association website.<sup>1</sup>

## II. Summary of New § 45Q Tax Credit Program.

- a. First, the legislation changes the type of carbon eligible for the credit from carbon dioxide (or “CO<sub>2</sub>” to any form of carbon oxide (or “CO<sub>x</sub>”).
- b. Under the program, tax credits are granted to the entity capturing the CO<sub>x</sub> (i.e., the owner of the capture facility). This could be CO<sub>x</sub> sources such as ethanol plants, steel mills, coal or gas power plants, bioenergy power plants, direct air

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<sup>1</sup> See [www.USEA.org](http://www.USEA.org). The principal authors of the report are Peter Connors, Ken Ditzel, Fengrong Li and Joshua Emmett.

capture facilities, etc. However, in the case of direct capture facilities, only CO<sub>2</sub> is eligible for the credit.

- c. To be eligible for the credit, the CO<sub>x</sub> must be captured from a “qualified facility.” A qualified facility is either an “industrial facility” or a “direct air capture facility.”
- d. To be a qualified facility, construction of the qualified facility must begin before January 1, 2026, and either construction of the carbon capture equipment must also begin prior to January 1, 2026, or the original plan and design for the facility must include installation of carbon capture equipment.
- e. Once captured, the facility can choose to permanently store the CO<sub>x</sub> in deep saline formations or use the CO<sub>2</sub> by providing it to companies that will utilize it in the production of products ranging from plastics, concrete, other commercial materials and enhanced oil recovery (or “EOR”). In the case of saline formations and EOR, the CO<sub>x</sub> is injected deep underground (multiple miles) to isolate it from the atmosphere. For other forms of utilization, the products must also provide a net reduction of emissions.
- f. The value of the tax credit depends upon the type of CO<sub>x</sub> storage. CO<sub>x</sub> used for saline storage would receive \$50 per metric ton of CO<sub>x</sub> stored while utilization in products, including EOR, would receive only \$35 per metric ton of CO<sub>x</sub>. The credit amounts are a significant increase over the amounts allowed under the 2008 legislation.
- g. Saline storage earns a higher \$/ton CO<sub>x</sub> storage credit than utilization because saline operations do not generate a

marketable product and therefore require a higher incentive level to be economic.

- h. The facilities capturing CO<sub>x</sub> generate the 45Q tax credits for up to 12 years if construction is started within the specified time period. This is a new feature of the program.
- i. Finally, in an important change from the original provision, the owner of the facility may assign the credit to another party if that person disposes of, utilizes the CO<sub>x</sub> or uses the CO<sub>x</sub> as a tertiary injectant.
- j. Proposed regulations (the “Proposed Regulations”) were issued on May 28, 2020, addressing many of the issues under revised § 45Q. On January 6, 2021, Final Regulations were issued. The Final Regulations address most of the issues that remained after the Proposed Regulations.

### III. Section 45Q—2008 Legislation

- a. Section 45Q was enacted by § 115 of the Energy Improvement and Extension Act of 2008, Division B of Pub. L. No. 110-343, 122 Stat. 3765, 3829 (October 3, 2008), to provide a credit for the sequestration of carbon dioxide.
- b. In the 2008 legislation, § 45Q(a)(2) allowed a Section 38 general business credit for CO<sub>2</sub> sequestration associated with EOR projects at a rate of \$10 per metric ton. The credit covered qualified CO<sub>2</sub> which is: 1) captured by the taxpayer at a qualified facility and 2) used by the taxpayer as a tertiary injectant in a qualified enhanced oil or natural gas recovery project.

- c. Under the original 2008 legislation, taxpayers claiming the \$10 per metric ton credit for CO<sub>2</sub> used in an EOR project did not have to dispose of the CO<sub>2</sub> in “secure geological storage.” Section 45Q was amended by § 1131 of the American Recovery and Reinvestment Tax Act of 2009, Division B of Pub. L. No. 111-5, 123 Stat. 115 (February 17, 2009) (the “2009 Amendment”). Early in 2009, however, Congress took action to eliminate one of the main differences between § 45Q credit available for EOR projects and other types of projects. The American Recovery and Reinvestment Act of 2009 added I.R.C. § 45Q(a)(2)(C) and required the CO<sub>2</sub> used in EOR projects to be “disposed of by the taxpayer in secure geological storage.” Sec. 1131(a), P.L. 111-5, 111th Cong., 1st Sess. (2009). The amendment was effective for CO<sub>2</sub> captured after February 17, 2009. Sec. 1131(c), P.L. 111-5, 111th Cong., 1st Sess. (2009). Thus, for CO<sub>2</sub> captured after this effective date, a taxpayer must not just show the CO<sub>2</sub> was used in an EOR project, the taxpayer must also show the CO<sub>2</sub> was disposed of in secure geological storage to be able to receive the § 45Q(a)(2) credits. The legislation uses the same definition of “secure geological storage” for EOR projects as it does for other types of storage facilities. Sec. 1131(b)(1)(A), P.L. 111-5, 111th Cong., 1st Sess. (2009).
- d. Section 45Q was amended more recently by § 41119 of the Bipartisan Budget Act of 2018 (BBA), Pub. L. No. 115-123 (February 9, 2018).
- e. As a result of the modifications made by the BBA amendment, the credit under § 45Q now applies to the sequestration of

“qualified carbon oxide,” a broader term than qualified carbon dioxide.

- i. For example, this includes both carbon monoxide and carbon dioxide.
  
- f. In Notice 2009-83, 2009-44 I.R.B. 588, the IRS provided interim guidance on a number of selective issues. This included guidance on determining eligibility for the credit for carbon dioxide sequestration, the amount of the credit and rules regarding adequate security measures for secure geological storage of carbon dioxide. The notice also provided guidance on the procedures for claiming the credit on a tax return. Taxpayers could rely on Notice 2009-83, as modified by Notice 2011-25, until additional guidance is issued. Notice 2009-83 was modified in Notice 2011-25 by removing provisions relating to the application of §§ 48A and 48B, which also involve carbon dioxide capture and sequestration. One of the complexities for the IRS in providing guidance with respect to the standards for “secure geological storage” under § 45Q is the need for coordination with multiple governmental agencies, including the Environmental Protection Agency, the Secretary of Energy, and the Secretary of the Interior,
  
- g. One of the key features of Notice 2009-83 was its announcement of the standards relating to what is a secure geological storage. This is contained in Section 5 of Notice 2009-83. Section 6 of Notice 2009-83 also contained an annual report requirement. Section 7 contained a recordkeeping requirement.



- h. Notice 2009-83 identified two sets of future EPA regulations that could impact whether a site qualified as “secure geological storage” under § 45Q(d)(2). This included the proposed Underground Injection Control (“UIC”) program regulations for injection of CO<sub>2</sub> for the purpose of geological sequestration, and the Greenhouse Gas (“GHG”) reporting rules for reporting CO<sub>2</sub> that is geologically sequestered. Sections 5.02(b)(ii) and (iii).
- i. Under Notice 2009-83 a site would only be treated as “secure geological storage” if it met the modeling, well construction and other requirements established under the final UIC Class VI regulations. Those requirements were to be imposed in lieu of the Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories (the “IPCC Guidelines”). To qualify as “secure geological storage,” Notice 2009-83 also required a site to satisfy the Final Regulations on the GHG reporting of CO<sub>2</sub> that is geologically sequestered for long-term storage. The final GHG reporting regulations governing CO<sub>2</sub> that is geologically sequestered were to be used in lieu of the IPCC Guidelines. Sec. 5.02(b)(iii), Notice 2009-83. The requirements established by Notice 2009-83 are summarized below.
- j. Requirements of Secure Geological Storage.
  - (1) Measurement of CO<sub>2</sub> at the Source of Capture: Final Mandatory GHG Reporting Rule.

Section 5.02(a) of Notice 2009-83 notes that on September 22, 2009, the EPA issued the Final Mandatory GHG Reporting Rule (“Reporting Rule”) to require reporting

of greenhouse gas emissions from all sectors of the economy. The Reporting Rule applies to fossil fuel suppliers and industrial gas suppliers, including CO<sub>2</sub> suppliers, as well as to direct greenhouse gas emitters. The Reporting Rule does not require control of greenhouse gases; rather, it requires only that certain sources monitor and report emissions. A taxpayer claiming the § 45Q credit must use the methodology, inputs and equations in the Reporting Rule (or any successor rule) to calculate the amount of CO<sub>2</sub> measured at the source of capture. The amount reported under the Reporting Rule (or any successor rule) must be consistent with the amount of qualified CO<sub>2</sub> taken into account for purposes of the § 45Q credit.

(2) Sequestration Site Rules.

The sequestration site rules are contained in Section 5.02(b)(i), (ii) and (iii).

- i. IPCC Guidelines. Section 5.02(b)(i) describes the IPCC Guidelines. In order for geological storage to be considered adequately secure for purposes of the § 45Q credit such that the injected CO<sub>2</sub> does not escape into the atmosphere, a taxpayer must conduct at the frequency appropriate for the site conditions, except as otherwise provided under paragraph (c), the following procedures outlined in the 2006 IPCC Guidelines:
  - A. Conduct a site characterization by evaluating the geology of the storage site and surrounding strata and identifying the local and regional hydrogeology and

leakage pathways such as deep wells, faults and fractures.

- B. Conduct an assessment of the risks of CO<sub>2</sub> leakage, or escape of CO<sub>2</sub> from the subsurface to the atmosphere, by evaluating the potential for leakage through a combination of site characterization and realistic models that predict movement of CO<sub>2</sub> over time and locations where emissions might occur. A range of modeling tools is available, including reservoir simulators that are widely used in the oil and gas industry and have proved effective in predicting movement of gases and liquids, including CO<sub>2</sub>, through geological formations. Reservoir simulation can be used to predict the likely location, timing and flux of emissions. Additional numerical modeling techniques may need to be used to analyze aspects of the geology, such as multi-phase reaction transport models and geomechanical models.
  
- C. Monitor potential leakage pathways, measure leakage at those pathways as necessary, monitor the current and future behavior of the CO<sub>2</sub> and of the storage system and use the results of the monitoring plan to validate and/or update models as appropriate. Monitoring should be conducted according to a suitable plan. This should take into account the expectations from the modeling on where leakage might occur, as well as measurements made over the entire zone in which CO<sub>2</sub> is likely to be present.

- ii. UIC Program: Proposed Rules for Geologic Storage. Section 5.02(b)(ii) of Notice 2009-83 describes the Underground Injection Control (or “UIC”) program that was established under the authority of Part C of the Safe Drinking Water Act (42 U.S.C. 300h et seq.) (or “SDWA”), which regulates underground injection wells. The SDWA is designed to protect the quality of drinking water sources in the United States. The SDWA gives the EPA authority to issue regulations for state programs that contain “minimum requirements for effective programs to prevent underground injection which endangers drinking water sources.” Under the UIC program, the EPA promulgated a series of regulations (40 C.F.R. parts 144 through 148) to employ a multiple barrier approach that includes requirements for the proper geologic siting, construction, operation, testing and closure of injection wells to ensure that injected fluids remain isolated from underground sources of drinking water (“USDWs”) and the environment.

On July 25, 2008, the EPA proposed rules relating to federal requirements under the UIC Program for CO<sub>2</sub> Geologic Sequestration Wells (73 Fed. Register No. 144, 40 C.F.R. parts 144-146). The EPA proposed to create a new category of injection well (Class VI) under its existing UIC Program with new federal requirements to permit the injection of CO<sub>2</sub> for the purpose of geologic sequestration

(i.e., the long-term containment of a gaseous, liquid or supercritical CO<sub>2</sub> stream in subsurface geologic formations). The EPA proposed to tailor existing UIC program components to create standards appropriate for injecting large amounts of CO<sub>2</sub> into a variety of geologic formations to ensure that USDWs are not endangered. Section 5.02(b)(ii) of Notice 2009-83 also notes that the proposed UIC program rules have not been finalized as of the date of the notice. Once the UIC program rules are finalized, according to the notice, any taxpayer claiming the § 45Q credit who is covered by the new program rules must follow the modeling, monitoring, well construction and other requirements of the relevant permit as required under the rules. The requirements in the final UIC program rules (or any successor rules) will apply in lieu of the requirements of the IPCC Guidelines described above in paragraph (i). However, any taxpayer that is not covered by the final UIC program rules must continue to follow the procedures outlined in the IPCC Guidelines described in (i)

- iii. Proposed Geologic Sequestration Rules Reporting. Section 5.02(b)(iii) of Notice 2009-83 notes that Subpart PP of the Final Mandatory GHG Reporting Rule announces the EPA's plans to propose new rules

to require reporting of the amount of CO<sub>2</sub> that is geologically sequestered. Notice 2009-83 announced that when the proposed geologic sequestration rules are finalized, such rules (or any successor rules) will apply in addition to the final UIC program rules (to the extent applicable), and the requirements of the IPCC Guidelines described above in (i) will no longer apply.

- (3) Compliance with Additional Regulatory Requirements. Section 5.02(c) of Notice 2009-83 noted that EPA may impose additional or different requirements for secure geological storage, including additional methodology, inputs and equations to calculate the amount of CO<sub>2</sub> measured and verified at the source of injection and/or the amount of CO<sub>2</sub> emitted from secure geological storage. Furthermore, various aspects of geologic sequestration, including well construction, operation, well plugging and post-injection site closure may be subject to other existing or future requirements from government bodies, including EPA's regional or state UIC programs. Notice 2009-83 states that any taxpayer claiming the § 45Q credit must follow such additional requirements together with the Reporting Rule and the IPCC Guidelines (or, in lieu of the IPCC guidelines, the UIC program rule as applicable and the geologic sequestration rule, once they are finalized) in order to demonstrate secure geological storage for purposes of the § 45Q credit.

Notice 2009-83's statement regarding the Reporting Rule has engendered controversy.<sup>2</sup> It was repeated when the EPA finalized its rules in 2010.<sup>3</sup> When the EPA finalized its rules, Form 8933, Carbon Dioxide Sequestration Credit, was released. It included both a reference to those rules and added a requirement for taxpayers to follow the rules. Form 8933 is the IRS form currently used for claiming the credit.

k. Internal Revenue Manual 4.41.1.3.5 (12-03-2013).

This portion of the IRM contains guidance to IRS auditors examining claims for § 45Q Credits. It states that § 45Q and Notice 2009-83 state that a taxpayer claiming the credit must comply with evolving rules of the U.S. Environmental Protection Agency ("EPA") regarding the sequestration of CO<sub>2</sub> and reporting of CO<sub>2</sub> volumes measured at the source of capture and verified at the point of disposal or injection. It continues as follows:

1. "EPA promulgated final rules regarding the reporting of both CO<sub>2</sub> emissions and CO<sub>2</sub> use (including sequestration) for years after 2010. Subpart RR - Geologic Sequestration of Carbon Dioxide is

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<sup>2</sup> See <https://www.eaco2.org/wp-content/uploads/2019/04/45Q-Issue-Paper-FINAL-1.pdf>.

<sup>3</sup> <https://www.federalregister.gov/documents/2010/12/10/2010-29954/federal-requirements-under-the-underground-injection-control-uic-program-for-carbon-dioxide-co2> ("As clarified in the IRS guidance, taxpayers claiming the section 45Q tax credit must follow the appropriate UIC requirements. The guidance also clarifies that taxpayers claiming section 45Q tax credit must follow the MRV procedures that are being finalized under 40 CFR part 98, subpart RR in this final rule.").

applicable to the IRC 45 credit. Refer to <http://www.epa.gov/ghgreporting/reporters/subpart/rr.html>.”

2. “The Preamble to the EPA’s final rule states in plain language that, under the final rule, operators of facilities that are sequestering CO<sub>2</sub> in geologic storage must comply with Subpart RR regardless of whether the CO<sub>2</sub> is currently used as a tertiary injectant in an EOR project. EPA’s preamble also states that taxpayers claiming the 45Q tax credit after 2010 must follow Subpart RR’s “MRV procedures”. MRV stands for Monitor, Report and Verify. The MRV procedures require the operator to submit an MRV plan to the EPA for its approval, and to annually report CO<sub>2</sub> volumes, including amounts sequestered, pursuant to the plan. Examiners should obtain a copy of these documents.”

- I. FAA 20183701F (May 3, 2013).

This is a legal advice memorandum prepared by attorneys in the Office of Chief Counsel. This involved a claim for credits by a taxpayer. The taxpayer’s claim was audited, and the company did not obtain an MRV plan while operating as a Class II injector. The FAA contains an excellent summary of the legislative history relating to the 2009 Amendment. The date of the FAA and the release of the updated IRM referred to above are noteworthy.



The FAA notes that for CO<sub>2</sub> injected after December 31, 2010, Notice 2009-83 required an owner or operator of an enhanced oil recovery project to meet EPA's geologic sequestration reporting requirements under Subpart RR. The company could have remedied its failure to meet those reporting requirements by obtaining an EPA-approved Mandatory Reporting and Verification (or "MRV") plan for each of its enhanced oil recovery projects and by following the applicable EPA reporting requirements. Because the company did not obtain an MRV plan while operating as a Class II injector, it did not meet the requirements of § 45Q(a)(2)(C) for its CO<sub>2</sub> production at the facility. Thus, the IRS advised that the company's § 45Q credit claim for CO<sub>2</sub> sequestration should be disallowed.

m. Senator Menendez's Letters to Commissioner Rettig.

On November 19, 2019, Senator Menendez wrote to Commissioner Rettig identifying questionable claims for § 45Q credits made for the use of CO<sub>2</sub> for Enhanced Oil Recovery ("EOR"). The Inspector General for Tax replied on June 28, 2019. Consistent with the situation in FAA 2018701F, of the ten companies claiming 99.9 percent of the § 45Q credits, TIGTA found that only three had the required MRV plans in place with the EPA. As a result, \$893 million of credits had been incorrectly claimed.

IV. Carbon Capture Equipment Placed in Service Before February 9, 2018.

- a. As revised, § 45Q distinguishes between equipment placed in service before February 9, 2019, and on or after February 9, 2018.
- b. Section 45Q(a)(1) allows a credit of \$20 per metric ton of “qualified carbon oxide” (i) captured by the taxpayer using “carbon capture equipment.” which is originally placed in service at a qualified facility *before* the date of the enactment of BBA, (ii) disposed of by the taxpayer in “secure geological storage” and (iii) not used by the taxpayer as a tertiary injectant in a “qualified enhanced oil or natural gas recovery project.”
- c. Section 45Q(a)(2) allows a credit of \$10 per metric ton of qualified carbon oxide (i) captured by the taxpayer using carbon capture equipment which is originally placed in service at a qualified facility before the date of the enactment of BBA and (ii) either (I) used by the taxpayer as a tertiary injectant in a qualified enhanced oil or natural gas recovery project and disposed of by the taxpayer in secure geological storage or (II) utilized by the taxpayer in a manner described in § 45Q(f)(5).
- d. Section 45Q(g) further provides that in the case of any carbon capture equipment placed in service before the date of the enactment of BBA, the credit under § 45Q shall apply with respect to qualified carbon oxide captured using such equipment before the end of the calendar year in which the Secretary, in consultation with the Administrator of the Environmental Protection Agency, certifies that, during the

period beginning after October 3, 2008, a total of 75,000,000 metric tons of qualified carbon oxide have been taken into account. As of the end of 2019, the aggregate amount of qualified carbon oxide taken into account for purposes of § 45Q is 72,087,903 metric tons. See Notice 2020-40, Section 4, 2020-25 I.R.B. 952.

e. Under § 45Q(f)(6)(A), for any taxable year in which an “applicable facility” captures not less than 500,000 metric tons of qualified carbon oxide during the taxable year, a taxpayer may elect to have such facility, and any carbon capture equipment placed in service at such facility, deemed as having been placed in service on the date of the enactment of BBA.

i. Section 45Q(f)(6)(B) defines the term “applicable facility” as a qualified facility (i) that was placed in service before the date of the enactment of BBA and (ii) for which no taxpayer claimed a credit under § 45Q in regards to such facility for any taxable year ending before the date of the enactment of the BBA.

f. Under § 45Q(f)(7), for taxable years beginning in a calendar year after 2009, an inflation adjustment applies.

V. Carbon Capture Equipment Placed on or After February 9, 2018.

a. Section 45Q(a)(3) allows a credit of the applicable dollar amount per metric ton of qualified carbon oxide (i) captured by the taxpayer using carbon capture equipment that is originally placed in service at a qualified facility on or after the date of the enactment of the BBA during the *12-year period*

beginning on the date the equipment was originally placed in service, (ii) disposed of by the taxpayer in secure geological storage and (iii) neither used as a tertiary injectant in a qualified enhanced oil or natural gas recovery project nor utilized in a manner described in § 45Q(f)(5).

- i. Section 45Q(b)(1)(A)(i)(1) provides that, for any taxable year beginning in a calendar year after 2016 and before 2027, the applicable dollar amount for purposes of § 45Q(a)(3) is an amount equal to the dollar amount established by linear interpolation between \$22.66 and \$50 for each calendar year during such period. Notice 2018-93 contains a table setting forth the amounts. See Appendix A.
  - ii. An inflation adjustment applies for any taxable year beginning in a calendar year after 2026.
- b. Section 45Q(a)(4) allows a credit for qualified carbon oxide (i) captured by the taxpayer using carbon capture equipment that is originally placed in service at a qualified facility on or after the date of the enactment of BBA, *during the 12-year period* beginning on the date the equipment was originally placed in service and (ii) either (I) used by the taxpayer as a tertiary injectant in a qualified enhanced oil or natural gas recovery project and disposed of by the taxpayer in secure geological storage or (II) utilized by the taxpayer in a manner described in § 45Q(f)(5).
- i. Section 45Q(b)(1)(A)(i)(II) provides that, for any taxable year beginning in a calendar year after 2016 and before 2027, the applicable dollar amount for purposes of § 45Q(a)(4) is an amount equal to the

dollar amount established by linear interpolation between \$12.83 and \$35 for each calendar year during such period. See Appendix A.

- ii. An inflation adjustment applies for any taxable year beginning in a calendar year after 2026.
- iii. As revised, § 45Q expands eligibility to projects that put captured CO<sub>2</sub> to a range of beneficial uses while reducing emissions. Before the revision, the only beneficial use allowed under § 45Q was the utilization of CO<sub>2</sub> for enhanced oil and gas recovery coupled with geologic storage.
- iv. Projects that capture carbon monoxide are also now eligible, in addition to projects that capture CO<sub>2</sub>.
- v. Projects that sell CO<sub>x</sub> for beneficial use in enhanced oil and gas recovery can only claim the credit for the amount of captured CO<sub>x</sub> that is stored in secure geologic storage.
- vi. Under § 45(Q)(f)(5)(B), for all other uses eligible for the credit, such as CO<sub>x</sub> conversion to products like cement, plastics or chemicals, or utilizing CO<sub>x</sub> to grow algae to produce biofuels, the projects must result in a net reduction in emissions on a lifecycle basis.

## VI. Production Requirement

- a. There are different production requirements depending on the nature of the facility.

b. The term “qualified facility” means any industrial facility or direct air capture facility:

(1) the construction of which begins before January 1, 2026, and:

(A) construction of carbon capture equipment begins before such date or

(B) the original planning and design for such facility includes installation of carbon capture equipment, and

(2) which captures:

(A) in the case of a facility which emits not more than 500,000 metric tons of carbon oxide into the atmosphere during the taxable year, not less than 25,000 metric tons of qualified carbon oxide during the taxable year which is utilized,

(B) in the case of an electricity generating facility which is not described in subparagraph (A), not less than 500,000 metric tons of qualified carbon oxide during the taxable year, or

(C) in the case of a direct air capture facility or any facility not described in subparagraph (A) or (B), not less than 100,000 metric tons of qualified carbon oxide during the taxable year.

Type of Facility	Minimum Annual Capture Requirement and Other Requirements
Any facility other than direct air capture	<ul style="list-style-type: none"> <li><input type="checkbox"/> Must capture at least 25,000 metric tons of carbon oxide</li> <li><input type="checkbox"/> Facility must emit no more than 500,000 metric tons of carbon oxide</li> <li><input type="checkbox"/> Carbon oxide must be utilized in a manner consistent with § 45Q(f)(5)</li> </ul>
Electric generating facility	<ul style="list-style-type: none"> <li><input type="checkbox"/> Must capture at least 500,000 metric tons of carbon oxide</li> <li><input type="checkbox"/> No minimum or maximum emission requirement</li> </ul>
Direct air capture facility or any other facility not described above	<ul style="list-style-type: none"> <li><input type="checkbox"/> Must capture at least 100,000 metric tons of carbon dioxide (in the case of direct air capture facilities) or carbon oxide</li> </ul>

VII. Secure Geological Storage.

- a. This includes storage at deep saline formations, oil and gas reservoirs and unminable coal seams under such conditions as the IRS may determine under regulations.
- b. According to Form 8933, Carbon Oxide Sequestration Credit, after 2010, the following apply:
  - i. Secure geological storage requires approval by the EPA of a Monitoring, Reporting and Verification Plan submitted by the operator of the storage facility or tertiary injection project.
  - ii. The annual amount of carbon oxide claimed for the credit must be reconciled with amounts reported to the EPA under its Greenhouse Gas Reporting Program, Subpart RR.

VIII. Who Is Entitled to the Credit?

- a. Under § 45Q(f)(3)(A), except as provided in § 45Q(f)(3)(B) or in any regulations prescribed by the Secretary, any credit under § 45Q shall be attributable to (i), in the case of qualified carbon oxide captured using carbon capture equipment which is originally placed in service at a qualified facility before the date of the enactment of the BBA, the person that captures and physically or contractually ensures the disposal, utilization or use as a tertiary injectant of such qualified carbon oxide and (ii), in the case of qualified carbon oxide captured using carbon capture equipment which is originally placed in service at a qualified facility on or after the date of the enactment of BBA, the person that owns the carbon capture



equipment and physically or contractually ensures the capture and disposal, utilization or use as a tertiary injectant of such qualified carbon oxide.

- b. Under § 45Q(f)(3)(B), if the owner of the carbon capture equipment makes an election in such time and manner as the Secretary may prescribe by regulations, the credit under § 45Q is allowable to the person that disposes of the qualified carbon oxide, utilizes the qualified carbon oxide or uses the qualified carbon oxide as a tertiary injectant.
  - i. The ability to assign the credit is a major change in the mechanism. Moreover, the ability to assign the credit will likely change the structure of project company financing ventures, as investors may conclude an investment in the party that disposes of the CO<sub>x</sub> involves less risk, for example, if the party disposing of the CO<sub>x</sub> has income and cash flow from operations.
  - ii. In Notice 2009-83, addressing the pre-BBA provisions, the IRS stated that if the qualified facility is owned by a partnership that has not made a valid election under § 761(a), the partnership will be considered the taxpayer for purposes of this notice. In such cases, the § 45Q credit must be allocated in accordance with § 1.704-1(b)(4)(ii).
  - iii. If the qualified facility is owned by a partnership that has made a valid § 761(a) election, then each partner in the partnership will be considered the taxpayer for purposes of this notice. In such case, the taxpayer may claim the § 45Q credit in accordance with its portion of

the total amount of qualified CO<sub>2</sub> that is commensurate with its undivided ownership of the qualified facility.

IX. Capture and Disposal Must Occur in the United States.

- a. The § 45Q credit applies only to qualified CO<sub>x</sub> that is captured and disposed of or used as a tertiary injectant within the United States or a possession of the United States.

X. Recapture.

- a. Section 45Q(f)(4) provides that the Secretary shall, by regulations, provide for recapturing the benefit of any credit allowable under § 45Q(a) with respect to any qualified carbon oxide which ceases to be captured, disposed of or used as a tertiary injectant in a manner consistent with the requirements of § 45Q. In Notice 2009-83, the IRS stated that procedures regarding § 45Q credit recapture will be provided in future guidance. However, no guidance was provided. The Proposed Regulations and, more recently, the Final Regulations address recapture.

XI. Utilization.

- a. Section 45Q(f)(5)(A) provides that, for purposes of § 45Q, utilization of qualified carbon oxide means (i) the fixation of such qualified carbon oxide through photosynthesis or chemosynthesis, such as through the growing of algae or bacteria, (ii) the chemical conversion of such qualified carbon oxide to a material or chemical compound in which such qualified carbon oxide is securely stored, or (iii) the use of such qualified carbon oxide for any other purpose for which a commercial market exists (with the exception of use as a

tertiary injectant in a qualified enhanced oil or natural gas recovery project), as determined by the Secretary.

- b. Section 45Q(f)(5)(B)(i) provides that, for purposes of determining the amount of qualified carbon oxide utilized by the taxpayer under § 45Q(a)(2)(B)(ii) or 45Q(a)(4)(B)(ii), such amount shall be equal to the metric tons of qualified carbon oxide which the taxpayer demonstrates, based upon an analysis of lifecycle greenhouse gas emissions and subject to such requirements as the Secretary, in consultation with the Secretary of Energy and the Administrator of the EPA, determines appropriate were (I) captured and permanently isolated from the atmosphere or (II) displaced from being emitted into the atmosphere, through use of a process described in § 45Q(f)(5)(A).
- c. Under § 45Q(f)(5)(B)(ii), the term “lifecycle greenhouse gas emissions” has the same meaning given to such term under subparagraph (H) of § 211(o)(1) of the Clean Air Act (42 U.S.C. 7545(o)(1)), as in effect on the date of the enactment of BBA, except that “product” shall be substituted for “fuel” each place it appears in such subparagraph.

XII. Broad Regulatory Authority Under § 45Q.

- a. Pursuant to § 45Q(h), the Secretary may prescribe such regulations and other guidance as may be necessary or appropriate to carry out this section, including regulations or other guidance to (1) ensure proper allocation under § 45Q(a) for qualified carbon oxide captured by a taxpayer during the taxable year ending after the date of the enactment of BBA and (2) determine whether a facility satisfies the requirements under § 45Q(d)(1) during such taxable year.

XIII. Request for Comments in Notice 2019-32.

- a. In Notice 2019-32, the Treasury Department and IRS issued a request for comments. The comments were due July 4, 2019. In addition to general comments, the Treasury Department and the IRS requested comments on several specific issues. In addition, Notice 2019-32 states that taxpayers may rely on Notice 2009-83, as modified by Notice 2011-25, until additional guidance is issued.
- b. Secure Geological Storage. As noted above, [IRS Form 8933](#) defines “Secure Geological Storage” as requiring approval by the EPA of a Monitoring, Reporting and Verification Plan (MRV Plan) submitted by the operator of the storage facility or tertiary injection project. Thus, meeting the Form 8933 conditions would be achieved by either receiving a Class II UIC (Underground Injection Control) permit plus an approved MRV Plan or receiving a Class VI UIC permit plus an approved MRV Plan.
  - i. UIC permits are required for all injection well operators. Class VI UIC operators must also get an EPA-approved MRV plan as required under the Greenhouse Gas Reporting Program (“GHGRP”), set forth in 40 C.F.R. Part 98. However, IRS Form 8933 adds regulatory requirements for Class II UIC permit holders (enhanced oil recovery operations) who are not currently required to get an EPA-approved MRV plan. IRS solicited comments on whether there are alternatives to this approach.
  - ii. Notice 2019-32 also states that IRS Form 8933 also “clarifies” that the annual amount of carbon oxide

claimed for the credit must be reconciled with amounts reported to the EPA under GHGRP, Subpart RR. See the EPA website at [www.epa.gov](http://www.epa.gov) and Notice 2009-83, 2009-44 I.R.B. 588, for more information on secure geological storage.

- iii. Are there technical criteria different from or in addition to those provided in the EPA's GHGRP that should be used to demonstrate secure geological storage? Are there existing guidelines, standards, or regulations that could be used to demonstrate secure geological storage such as those developed by the International Organization for Standardization (ISO)?
  - iv. Should the EPA's GHGRP rules continue to be the reporting requirements for purposes of § 45Q, and should an approved MRV Plan from the EPA be received before any § 45Q credit can be claimed? Are there any viable alternatives to the Subpart RR reporting requirements, such as a third-party, Department of Energy or State certification?
- c. Recapture. Pursuant to § 45Q(f)(4), taxpayers must recapture the benefit of any credit allowable under § 45Q(a) with respect to any qualified carbon oxide that ceases to be captured, disposed of or used as a tertiary injectant in a manner consistent with the requirements of § 45Q.
- i. What should the standard be for triggering and measuring recapture?
  - ii. How should the recapture of the benefit of the credits relate to the requirements of § 45Q and the issues

contemplated in this request for comments, in particular the rules for secure geological storage involving the disposal or use of carbon oxide as a tertiary injectant?

- d. Terms and Definitions. Is guidance needed to further clarify terms and definitions appearing in § 45Q, such as carbon capture equipment, qualified carbon oxide, direct air capture facility, qualified facility, tertiary injectant utilization or lifecycle greenhouse gas emissions?
- e. Utilization. Is guidance required in defining what types of utilization qualify as “fixation of qualified carbon oxide through photosynthesis or chemosynthesis, such as through the growing of algae or bacteria” as described in § 45Q(f)(5)(A)?
- f. Lifecycle Emissions. Is guidance required to establish the boundaries for lifecycle emissions for carbon oxide utilization to determine the amount of qualified carbon oxide that is “displaced from being emitted into the atmosphere” as described in § 45Q(f)(5)(B)?
- g. Contractual Terms. Under § 45Q(f)(3)(A), the credit is attributable to the person that captures and physically or contractually ensures the disposal, utilization or use of the qualified carbon oxide as a tertiary injectant. The Treasury Department and the IRS seek comments on the types of contractual arrangements that investors anticipate with parties who capture, dispose of or utilize qualified CO. What are common terms of contracts ensuring the disposal, utilization or use of qualified CO as a tertiary injectant? What should result if such terms are determined to be insufficient?

- h. Election to Transfer Credits. What factors should be considered in determining the time and manner of the election under § 45Q(f)(3)(B) to transfer the § 45Q credit to a person that disposes of the qualified carbon oxide, utilizes the qualified carbon oxide or uses the qualified carbon oxide as a tertiary injectant? If such an election is made, what issues should be considered regarding the transfer of the § 45Q credit?
- i. Beginning of Construction. What constitutes the beginning of construction for purposes of § 45Q(d)?
- j. Structuring Issues. Is guidance needed concerning structures in which project developers and participating investors would be respected as partners in a partnership generating a § 45Q credit? Further, is guidance needed on allocating the credit and recapture of the credit among the partners in a partnership?
- k. Determining the Amount of Qualified Carbon Oxide Utilized by the Taxpayer. What issues may arise when determining the amount of metric tons of qualified carbon oxide utilized by the taxpayer under § 45Q(a)(2)(B)(ii) or § 45Q(a)(4)(B)(ii), based upon an analysis of lifecycle greenhouse emissions and subject to such requirements as the Secretary, in consultation with the Secretary of Energy and Administrator of the EPA, determines appropriate, were (i) captured and permanently isolated from the atmosphere or (ii) displaced from being emitted into the atmosphere through use of a process described in § 45Q(f)(5)(A)?
- l. Notice 2020-12, Rev. Proc. 2020-12. the Proposed Regulations and, more recently, the Final Regulations

address most of the questions for which comments were requested.

XIV. Comments on Notice 2019-32.

- a. There were numerous comments submitted. A link to the comments is attached below.<sup>4</sup>
- b. An important industry group is the Carbon Capture Coalition,<sup>5</sup> which consists of a number of prominent industry representatives. The Carbon Capture Coalition made the following “technical” proposals to § 45Q in its letter date June 3, 2019:
  - i. eliminate the 25,000-metric ton minimum annual capture threshold in § 45Q that inadvertently risks precluding most carbon utilization projects from eligibility;
  - ii. prevent the disallowance of § 45Q and § 48A under the Base Erosion and Anti-Abuse Tax-BEAT, which otherwise risks reducing the pool of available investors in carbon capture projects; and
  - iii. enable developers of power plant carbon capture retrofit projects to access available § 48A tax credits by incorporating needed technical fixes provided for in the Carbon Capture Modernization Act (S. 407) (2019).

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<sup>4</sup> <https://www.regulations.gov/docketBrowser?rpp=25&so=DESC&sb=commentDueDate&po=0&D=IRS-2019-0026>

<sup>5</sup> <https://carboncapturecoalition.org/about-us/> The Carbon Capture Coalition is a nonpartisan coalition supporting the deployment and adoption of carbon capture technology.



- c. The Coalition also makes several policy related proposals:
  - i. Providing additional flexibility to the existing transfer provision in the § 45Q statute by including additional taxpayers who are involved in the carbon capture transaction to be allowable as transferees (modeled on the transfer provision in § 45J(e) of the Advanced Nuclear Tax Credit);
  - ii. Establishing a revenue-neutral refundable option for § 45Q to enable a greater diversity of companies and business models to benefit from the tax credit; and
  - iii. Creating an “American Energy Bond” option to allow project developers to make interest payments in the form of tax credits if they invest bond proceeds in qualified energy infrastructure projects, including carbon capture and utilization.
- d. Guiding Principles for Demonstrating Secure Geological Storage.

While secure geological storage is generally understood, the methodology needed to verify storage is open to some debate. See the letter dated November 27, 2019, from a group consisting of representatives from the Clean Air Task Force, the Environmental Defense Fund, Clear Path Action, Carbon Utilization Research Council and The Nature Conservancy. This highly respected environmental group

proposed establishing a methodology for third-party verification.<sup>6</sup>

XV. Notice 2020-12—Beginning of Construction.

- a. In Notice 2020-12, the IRS provided guidance on when a qualified facility would be considered to have begun construction. Notice 2020-12 follows similar guidance issued in connection with other renewable energy credits in Notice 2013-29 (PTC and ITC), Notice 2014-46 (PTC and ITC), Notice 2016-31 (PTC and ITC), Notice 2017-4 (PTC and ITC) and Notice 2018-59 (ITC) but extends the term required for completion from four years to six years.
- b. Notice 2020-12 provides two methods for a taxpayer to establish that construction of a qualified facility or carbon capture equipment has begun for purposes of the § 45Q Credit. A taxpayer may establish the beginning of construction by starting physical work of a significant nature (Physical Work Test). A taxpayer may also establish the beginning of construction by meeting a safe harbor based on having paid or incurred five percent or more of the total cost of the qualified facility or carbon capture equipment (Five-Percent Safe Harbor).

Both methods require that the taxpayer make continuous efforts toward completion of the construction. This is referred to as the “continuity test.” Notice 2020-12 also establishes a safe harbor for the continuity test.

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<sup>6</sup> See November 27, 2019 letter available at: <https://www.regulations.gov/document?D=IRS-2019-0026-0110>.

- c. The Physical Work Test—Continuous Construction. A continuous program of construction involves continuing physical work of a significant nature. Whether a taxpayer maintains a continuous program F to satisfy the Continuity Requirement will be determined by the relevant facts and circumstances.
- d. The Five-Percent Safe Harbor—Continuous Efforts. Whether a taxpayer makes continuous efforts to advance towards completion of a qualified facility or carbon capture equipment to satisfy the Continuity Requirement will be determined by the relevant facts and circumstances.
- e. Continuity Test Safe Harbor. Notice 2020-12 also establishes a safe harbor for the continuity test. This safe harbor applies whether the taxpayer begins construction by satisfying the Physical Work Test or the Five-Percent Safe Harbor. Under this test, if a taxpayer places a qualified facility or carbon capture equipment in service by the end of a calendar year that is no more than six calendar years after the calendar year during which construction of the qualified facility or carbon capture equipment began (Continuity Safe Harbor Deadline), the qualified facility or carbon capture equipment will be considered to satisfy the Continuity Safe Harbor. The six-year period is a relaxation of the four-year period established in the ITC and PTC notices discussed above.

If a qualified facility or carbon capture equipment is not placed in service before the Continuity Safe Harbor Deadline, whether the qualified facility or carbon capture equipment satisfies the continuity test under either the Physical Work

Test or the Five-Percent Safe Harbor will be determined based on the relevant facts and circumstances.

Notice 2020-12 provides the following example. Assume construction begins on a qualified facility or carbon capture equipment on January 15, 2021, and the qualified facility or carbon capture equipment is placed in service by December 31, 2027, the qualified facility or carbon capture equipment will be considered to satisfy the Continuity Safe Harbor. If the qualified facility or carbon capture equipment is not placed in service before January 1, 2028, whether the Continuity Requirement was satisfied will be determined based on the relevant facts and circumstances.

For components of qualified facility or carbon capture equipment that are manufactured, constructed, or produced for the taxpayer by another person under a binding written contract, the work performed and amounts paid or incurred under the contract are taken into account in determining whether the Physical Work Test or Five Percent Safe Harbor Test is met, provided the contract is entered into prior to the work taking place or the amounts paid or incurred. A written contract is binding only if it is enforceable under local law against the taxpayer or a predecessor and does not limit damages to a specified amount (for example, by use of a liquidated damage provision). For this purpose, a contractual provision that limits damages to an amount equal to at least five percent of the total contract price will not be treated as limiting damages to a specified amount.

i. Cost Overruns.

Notice 2020-12 also addressed the impact of cost overruns on the availability of the safe harbor. It does so in the context of a single project that is part of a group of multiple qualified facilities or units of carbon capture equipment.

If the total cost of a qualified facility or carbon capture equipment that is a single project comprised of multiple qualified facilities or multiple units of carbon capture equipment exceeds its anticipated total cost, so that the amount a taxpayer actually paid or incurred with respect to the single project turns out to be less than five percent of the total cost of the single project at the time it is placed in service, the Five-Percent Safe Harbor is not satisfied. However, the Five-Percent Safe Harbor will be satisfied and the § 45Q Credit may be claimed with respect to some of the qualified facilities or units of carbon capture equipment comprising the single project as long as the total aggregate cost of those qualified facilities or units of carbon capture equipment that are eligible for the § 45Q Credit is not more than 20 times greater than the amount the taxpayer paid or incurred.

- f. Definitions. As noted above, the term “qualified facility” means any industrial facility or direct air capture facility in which the construction of carbon capture equipment begins before January 1, 2024, or the original planning and design for such facility includes installation of carbon capture equipment. Notice 2020-12 provides definitions of the terms “carbon capture equipment,” “industrial facility” and “direct air capture,” which are key components of the definition of a qualified facility.

- i. Carbon Capture Equipment. Section 45Q does not define the term “carbon capture equipment.” However, the notice provides a definition. “Carbon capture equipment” includes all components of property that are used to capture or process (for example, separation, purification, drying, and/or compression) carbon oxide until it is transported away from the qualified facility for disposal, utilization, or use as a tertiary injectant. For these purposes, carbon capture equipment includes a system of gathering lines that collect carbon oxide captured from a qualified facility or multiple qualified facilities that constitute a single project for the purpose of transporting that carbon oxide away from the qualified facility or single project to a pipeline used to transport carbon oxide from multiple taxpayers and projects.”
  
- ii. Industrial Facility. Section 45Q does not define the term industrial facility. The Regulations define an industrial facility is a facility that produces a carbon oxide stream from a fuel combustion source, a manufacturing process or a fugitive carbon oxide-emission source that, absent capture and disposal or utilization, would otherwise be released into the atmosphere as industrial emission of greenhouse gas or lead to such release. An industrial facility does not include a facility that produces carbon dioxide through carbon dioxide production wells from natural carbon dioxide-bearing formations.
  
- iii. Direct Air Capture. Section 45Q(e)(1) provides that the term “direct air capture facility” means any facility that

uses carbon capture equipment to capture carbon dioxide directly from the ambient air. The notice also provides that a direct air capture facility does not include any facility that captures carbon dioxide that is deliberately released from naturally occurring subsurface springs or using natural photosynthesis.

- iv. The 80/20 Rule. Under what is commonly referred to as the “80/20 Rule,” a qualified facility or carbon capture equipment may qualify as originally placed in service even though it contains some used components of property, provided the fair market value of the used components of property is not more than 20 percent of the qualified facility or carbon capture equipment’s total value (the cost of the new components of property plus the value of the used components of property). For purposes of the 80/20 Rule, the cost of a new qualified facility or carbon capture equipment includes all properly capitalized costs of the new qualified facility or carbon capture equipment.

#### XVI. The Partnership Flip Structure.

- a. A key feature in financing renewable structures is the role of the partnership structure. In this regard, in Revenue Procedure 2007-65, the IRS set forth the criteria it would use in determining whether or not a partnership’s allocation methodology for wind projects complied with the substantial economic effect rules of § 704. Under the safe harbor of Rev. Proc. 2007-65, the percentage allocations may vary

provided that before the flip the developer cannot receive less than a one-percent allocation of the income and gain, and at no point during the life of the partnership, including after the flip, the developer cannot receive more than 95 percent of the allocation of income and gain. The IRS subsequently provided advice regarding allocations that largely mirrored the prior advice in Revenue Procedure 2014-12 for the historic rehabilitation credit.

- b. Numerous commentators requested that the IRS extend the advice in the prior two revenue procedures to the § 45Q structures. In February 2020, the IRS issued Revenue Procedure 2020-12 to address the application of the partnership flip structure to transactions involving the § 45Q Credit.
- c. Revenue Procedure 2020-12 provides a safe harbor for partnership flip structures involving the § 45Q Credit.
- d. The Revenue Procedure provides that the IRS will respect allocations of the § 45Q Credit as agreed to in the operating agreement of the partnership if the requirements of the safe harbor are met, rather than allocating profits according to each partner's interest in the partnership. An allocation based on each partner's interest in a partnership requires an analysis based on a review of the facts and circumstances and could result in tax equity investors being allocated a smaller share of the § 45Q Credit than the operating agreement would otherwise allocate (typically 99 percent). The Revenue Procedure is built around the partnership flip structure and identifies the parties as the "Investor," the "Developer" and the "Project Company." The Revenue



Procedure also states that the IRS will not issue private letter rulings on any issues under subchapter K for partnerships claiming or seeking to claim the § 45Q Credit.

The key criteria are as follows:

1. Minimum Partnership Interest. The Developer must have a minimum of one-percent partnership interest in each material item of partnership income, gain, loss, deduction and credit at all times during the existence of the Project.
  - a. This permits the tax equity investor to be allocated 99 percent of the tax credits.
2. Investor's Minimum Partnership Interest. Each Investor must have, at all times during the period it owns a partnership interest, a minimum interest in each material item of partnership income, gain, loss, deduction and credit equal to at least five percent of the Investor's percentage interest in each such item for the taxable year for which the Investor's percentage share of that item is the largest.
  - a. After the flip, the tax equity investor will typically take a five-percent interest.
3. Investor's Minimum Unconditional Investment. On the date the Investor acquires an interest in a Project Company, the Investor must make a minimum unconditional investment equal to at least 20 percent of the sum of the fixed capital investment plus any reasonably anticipated contingent investment required to be made by the Investor under the partnership

agreement. The Investors must not be protected against loss directly or indirectly through arrangements with other parties involved in the project or related parties.

a. The investor must then maintain this “minimum investment” as long as it owns its partnership interest, except that it may be reduced for distributions of cash from the operations of the partnership.

4. Contingent Consideration. More than 50 percent of the sum of the fixed investment plus reasonably anticipated contingent investment to be made by an Investor with respect to a partnership interest must be fixed and determinable obligations that are not contingent in amount or certainty of payment must be made. However, contributions to pay ongoing operating expenses will not be treated as part of the Investor’s contingent investment.

a. The ability of tax equity investors to use a “pay-as-you-go” structure (meaning that further investment will be contingent on the amount of carbon captured or otherwise be contingent in amount) for purposes of the § 45Q program is expanded as compared to the level of contingent consideration permitted in the PTC structure. For the § 45Q Credit, up to 49.99 percent of a tax equity investor’s investment may be contingent. This is an increase from the 25 percent used under the PTC program.

- b. This is an important modification since some projects may have little to no cash flow. The lack of cash flow from the project means that the § 45Q Credit would account for nearly all of the tax equity investor's return on investment. Tax equity investors under the § 45Q program will likely want to maximize pay-as-you-go payments because, unlike the PTC program where cash could be swept to the tax equity investor if the partnership did not flip by the end of the PTC period, there will likely be much less cash available to sweep in carbon capture transactions.
- 5. Purchase Rights. Neither the Developer, the Investors nor any related person may have a call option or other contractual right or agreement to purchase, at any time, the carbon capture equipment, any property included in the carbon capture equipment or an interest in the project company at a future date (other than a contractual right or agreement for a present sale).
- 6. Sale Rights. The Investor may have a put option, but the put must be exercisable at fair market value as determined at the time the put option is exercised.
  - a. This is consistent with historic tax credit guidance but is the exact opposite of the wind guidance, which prohibits puts but allows developer call options that are exercisable at fair market value. Put options must be exercisable at fair market value as determined at the time

the put option is exercised to meet the safe harbor.

7. Bona Fide Equity Investment. The Investor's interest in the partnership must have a reasonably anticipated value commensurate with the Investor's overall (not merely largest) percentage interest in the project, ignoring tax deductions, credits and allowances at the federal, state and local levels. In other words, the investor's relationship to the partnership must be that of a partner, as opposed to a lender that is lending funds to a borrower or some other non-equity relationship.
  - a. No person involved in any part of the project company may directly or indirectly guarantee or otherwise insure the investor's ability to claim the § 45Q Credit. Further, no person (or related person) involved in any part of the project company may guarantee that the Investor will receive distributions from the project company or consideration in exchange for its interest in the project company.
  - b. To show that the investor is a partner, the investor cannot be protected from losses and the potential upside cannot be limited, for example, in a manner similar to a preferred return representing a payment for capital. Further, the value of the investor's partnership interest cannot be reduced artificially. The Revenue Procedure lists unreasonable

developer, management, incentive or other fees, disproportionate rights to distributions or partnership interests issued to other partners for less than fair market value as examples of arrangements that are prohibited because they reduce the value of the investor's partnership interest or economic return.

8. Allocations of the § 45Q Credit. Allocations under the project company's partnership agreement must satisfy the requirements of § 704(b) and the applicable regulations. The § 45Q Credit and any recapture of the credit must be allocated in accordance with Treas. Reg. § 1.704-1(b)(4)(ii).
9. If the safe harbor is satisfied, the Revenue Procedure provides rules for the methodology for allocating the § 45Q Credit. The first rule applies to projects that generate income from activities related to carbon oxide; the second applies to projects that do not generate income from its activities related to carbon oxide. In the first scenario, the safe harbor requires the partnership to allocate the § 45Q Credit in proportion with each partner's share of income under the operating agreement. In the second scenario, the safe harbor requires the partnership to allocate the § 45Q Credit in proportion to each partner's share of losses or deductions associated with the costs of the capture, disposal, use or utilization of the carbon oxide.
10. Application of the ruling is illustrated with an example that largely parallels examples that were contained in

the production tax credit and historic rehab credit revenue procedures: The Revenue Procedure concludes that the IRS will treat the Investor as a partner in the Project Company and will treat the Project Company as properly allocating the § 45Q Credit in accordance with § 704(b). In the example, an investor and sponsor create a project company to build a qualified facility that will own and operate carbon capture equipment. The Project Company is an LLC classified as a partnership for federal income tax purposes that has been formed by the developer to own and manage a carbon capture project that (i) owns equipment; (ii) has rights to capture carbon oxide from an emitter; and (iii) sells the carbon oxide to an off-taker (which may be the developer and may be a partner). The operating agreement of the LLC allocates 99 percent of the tax credits to the investor, with the balance to the developer. The developer will acquire the equipment with a construction financing loan of \$100x and contribute it to project company at some point before the equipment is placed in service. The investor agrees to contribute \$50x, of which \$20x will be contributed on formation.

11. The agreements between the parties consist of a long-term contract with the emitter pursuant to which the project company will install capture equipment on or adjacent to the emitter's facility and will have rights to capture carbon oxide emissions. The project company will also be a party to a long-term contract with the off-taker pursuant to which the off-taker will undertake to

purchase carbon oxide from the project company. The off-taker will agree to use the carbon oxide as a tertiary injectant and to store the carbon oxide in a secure geological location and will avoid any release of the stored carbon oxide. Neither the developer nor any person involved in the project company will provide a guarantee or otherwise insure the Investor's ability to claim the § 45Q Credit, the cash equivalent of the credit or the repayment of any portion of the Investor's contribution due to an inability to claim the § 45Q Credit or guarantee that the Investor will receive distributions from the project company or consideration in exchange for its interest in the Project Company except for a put at fair market value.

12. The example describes the cash flows and the allocation of the § 45Q tax credits during three different periods. In the first period, all the cash flow goes to the developer, but the tax credits are allocated one percent to the developer and 99 percent to the investor. Period 1 will continue until the earlier of (i) the date that the developer receives an agreed cash return, which may be an amount equal to the aggregate contributions made by the developer; or (ii) a fixed outside date. During the second period, none of the cash flow goes to the developer and the tax credits are allocated one percent to the developer and 99 percent to the investor. Period 2 will continue until the investor reaches a specified rate of return. And finally, during the third period, cash flow and tax credits are allocated 95 percent to the developer and 5 percent to the

investor. The allocation of cash flow and credits in the example is as is summarized below:

	Developer		Investor	
	Cash	Gross Income/Loss and § 45Q Credits	Cash	Gross Income/Loss and § 45Q Credits
Period 1	100%	1%	0%	99%
Period 2	0%	1%	100%	99%
Period 3	95%	95%	5%	5%

13. The Revenue Procedure concludes that the IRS will treat the Investor as a partner in the Project Company and will treat the Project Company as properly allocating the § 45Q Credit in accordance with § 704(b).

#### XVII. Proposed Regulations Under Section 45Q

- a. As noted, on May 28, 2020, the IRS issued the Proposed Regulations. This is the third set of guidance that the IRS issued in 2020 under that section. In February the IRS issued Notice 2020-12 and Rev. Proc. 2020-12. The issuance of the Proposed Regulations is an important step in the development of the carbon capture use and storage programs. For a detailed discussion of the Proposed Regulations, see Connors and Emmett, “Developers and Tax Equity Investors Receive More Guidance on Carbon Capture Credit Requirements,” Bloomberg Tax Management Memorandum, 61 TMM 14, July 6, 2020.



- b. The Proposed Regulations are divided into five parts: (1) Prop. Reg. §1.45Q-1 contains various rules that will apply in connection with the § 45Q requirements; (2) Prop. Reg. §1.45Q-2 contains selected definitions; (3) Prop. Reg. §1.45Q-3 defines the term “secure geological storage,” and sets out the requirements for disposition of captured carbon via sequestration (burying) or injection in tertiary or enhanced oil recovery (“EOR”); (4) Prop. Reg. §1.45Q-4 sets forth the standards for utilization of carbon oxide; and (5) Prop. Reg. §1.45Q-5 sets forth the criteria for determining when the credit should be recaptured due to leakage. Taxpayers may apply the Proposed Regulations for taxable years ending on or after February 9, 2018, provided they comply with all five of the Proposed Regulations in their entirety and apply them in a consistent manner.

#### XVIII. Final Regulations

- a. Final regulations (the “Regulations” or “Final Regulations”) were issued on January 6 and published in the federal register on January 15, 2021.
- b. The Regulations follow the format of the Proposed Regulations. The Regulations are effective for tax years beginning after January 15, 2021, but taxpayers may apply the Final Regulations to taxable years beginning on or after January 1, 2018 provided they comply with all five provisions of the Regulations in their entirety and apply them in a consistent manner.
- c. The discussion below will address the Final Regulations.

#### XIX. Reg. § 1.45Q-1: Operational Points; Definitions

- a. Reg. § 1.45Q-1 recites many of the statutory criteria applicable in determining the dollar amount per metric ton of the credit, which depends on the year in which the qualified facility was placed in service and whether the qualified carbon oxide is disposed of, used in EOR or utilized in other permitted ways. The § 45Q Credit awarded for carbon oxide increases at a statutorily set rate from 2017 until 2026 and will thereafter increase according to an inflation adjustment. In 2026, the 45Q Credit for carbon oxides captured and disposed of (*i.e.*, sequestered) will be equal to \$50 per metric ton and the § 45Q Credit for carbon oxides used as a tertiary injectant or utilized by the taxpayer will be equal to \$35 per metric ton. As noted, this is an increase over the pre-BBA § 45Q Credit, which was equal to \$20 and \$10 per metric ton of CO<sub>2</sub> disposed of or used as a tertiary injectant, respectively.
  
- b. The Regulations provide that a taxpayer is not required to physically carry out the disposal, injection, or utilization of qualified carbon oxide to claim the § 45Q Credit if the taxpayer contractually ensures in a binding written contract that the party that physically carries out the disposal, injection or utilization of the qualified carbon oxide does so in the manner required under § 45Q and the Regulations. A taxpayer may enter into multiple binding written contracts with multiple parties for the capture, disposal, injection or utilization of qualified carbon oxide. A party that physically carries out the capture, disposal, injection or utilization of qualified carbon oxide may enter into multiple binding written contracts with multiple parties that own carbon capture equipment or capture or contractually ensure the capture of qualified carbon oxide.

A written contract is binding only if it is enforceable under state law against both the taxpayer and the party that physically carries out the disposal, injection or utilization of the qualified carbon oxide, or a predecessor or successor of either, and does not limit damages to a specified amount. For this purpose, a contractual provision that limits damages to an amount equal to at least five percent of the total contract price will not be treated as limiting damages to a specified amount. The Regulations cross reference to regulations section 1.168(k)-1(b)(4)(ii)(A)-(D) regarding the definition of a binding written contract.

- c. This section also sets forth the requirements applicable to the owner of the carbon capture equipment that enters into a contract with a third party for the disposal, injection or utilization of the carbon oxide, including contractual provisions that are required and those that are permissible to be treated as ensuring the capture, disposal, injection or utilization of the carbon oxide. Under the Regulations, contracts:
  - i. must include commercially reasonable terms and provide for enforcement of the party's obligation to perform the capture, disposal, injection or utilization of the qualified carbon oxide;
  - ii. may, but are not required to, include long-term liability provisions, indemnity provisions, penalties for breach of contract or liquidated damages provisions;
  - iii. may, but are not required to, include information including how many metric tons of qualified carbon oxide the parties agree to dispose of, inject or utilize;

- iv. may, but are not required to, include minimum quantities that the parties agree to dispose of, inject or utilize;
  - v. must, in the case of qualified carbon oxide that is intended to be disposed of in secure geological storage and not used as a tertiary injectant in a qualified enhanced oil or natural gas recovery project, obligate the disposing party to comply with Reg. § 1.45Q-3(b)(1) and (c), and, in the case of a recapture event, promptly inform the capturing party of all information that is pertinent to the recapture (i.e., location of leak, leaked amount of qualified carbon oxide, dollar value of the § 45Q Credit attributable to leaked qualified carbon oxide);
  - vi. must, for qualified carbon oxide that is intended to be used as a tertiary injectant in a qualified enhanced oil or natural gas recovery, obligate the disposing party to comply with Reg. § 1.45Q-3(b)(1) or Reg. §1.45Q-3(b)(2) and Reg. § 1.45Q-3(c), and in the case of a recapture event, promptly inform the capturing party of all information that is pertinent to recapture of the § 45Q Credit as listed in Reg. §1.45Q-5; and
  - vii. must, for qualified carbon oxide that is intended to be utilized in a manner specified in Reg. § 1.45Q-4 relating to utilization, obligate the utilizing party to comply with Reg. § 1.45Q-4.
- d. The taxpayer that owns the carbon capture equipment may elect to allow the person that disposes of, utilizes or uses the

carbon oxide to claim the § 45Q Credit.<sup>7</sup> The taxpayer may elect to allow such other person to claim the full or a partial amount of the § 45Q Credit during a taxable year. Further, if the owner of the carbon capture equipment contracts with multiple parties to dispose of, utilize or use the carbon oxide, the owner may elect to transfer the § 45Q Credit to some or all of the counterparties and may elect to transfer the full or a partial amount of the § 45Q Credit to which such counterparty is entitled. However, the electing taxpayer may not elect or otherwise allow the section 45Q credit to a contractor or subcontractor that physically captures carbon oxide on behalf of the taxpayer. The Regulations state that the disposer or injector that is eligible to be a credit claimant is the party that obtains the permit to dispose of the qualified carbon oxide in secure geological storage. A credit claimant may not allow the section 45Q credit to a subcontractor that performs the disposal, utilization or injection for the credit claimant

- e. The election to transfer the § 45Q Credit to a counterparty is filed annually by the owner of the carbon capture equipment.<sup>8</sup>
  - i. The maximum amount of § 45Q Credit allowable to each counterparty is proportional to the amount of qualified carbon oxide disposed of, utilized or used as a tertiary injectant by the credit claimant. Counterparties may receive allowances of § 45Q Credits from multiple owners of carbon capture equipment in the same taxable year.

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<sup>7</sup> Reg. §1.45Q-1(h)(3).

<sup>8</sup> Reg. §1.45Q-1(h)(3)(ii).

- ii. The taxpayer makes a § 45Q(f)(3)(B) election by filing a statement of election with the taxpayer's federal income tax return or Form 1065 for *each* taxable year in which the credit arises. The § 45Q(f)(3)(B) election must be made in accordance with Form 8933 (or successor forms, or pursuant to instructions and other guidance) no later than the time prescribed by law (including extensions) for filing the federal income tax return or Form 1065 for the year in which the credit arises.
- iii. The election may not be made on an amended Federal income tax return.
- iv. Form 8933, which was last updated in December 2020, has been updated to reflect the election. See [2020 Form 8933 \(irs.gov\)](#)

XX. Reg. § 1.45Q-2: Definitional Issues.

- a. This section discusses some key definitional issues. These include the definition of carbon capture equipment, qualified facilities, industrial facilities, direct air capture facilities, electricity generating facility and qualified enhanced oil or natural gas recovery project.
  - i. Carbon Capture Equipment. As noted, in Notice 2020-12, a definition for carbon capture equipment was set forth as follows:

“Carbon capture equipment includes all components of property that are used to capture or process (for example, separation, purification, drying, and/or compression) carbon oxide until it is transported away

from the qualified facility for disposal, utilization, or use as a tertiary injectant. For these purposes, carbon capture equipment includes a system of gathering lines that collect carbon oxide captured from a qualified facility or multiple qualified facilities that constitute a single project ... for the purpose of transporting that carbon oxide away from the qualified facility or single project to a pipeline used to transport carbon oxide from multiple taxpayers and projects.”

However, it was broadened in the Proposed Regulations with both specific inclusions and specific exclusions. The preamble to the Proposed Regulations does not address the rationale for change, but it is likely in response to comments that suggested that the definition was too narrow. The Proposed Regulations state, in general, carbon capture equipment includes all components of property that are used to capture or process carbon oxide until the carbon oxide is transported for disposal, injection or utilization. The definition in the Proposed Regulations is then divided into three parts: the first provides the uses of carbon capture equipment, the second defines carbon capture equipment components and the third describes excluded components.

For purposes of the Proposed Regulations, carbon capture equipment is equipment used for the purpose of: (1) separating, purifying, drying and/or capturing carbon oxide that would otherwise be released into the atmosphere from an industrial facility; (2) removing carbon oxide from the atmosphere via direct air

capture; or (3) compressing or otherwise increasing the pressure of carbon oxide.

Next, the Proposed Regulations provide non-exclusive lists of both carbon capture equipment components and excluded components.

- ii. Carbon Capture Equipment Components. Carbon capture equipment generally includes components of property necessary to compress, treat, process, liquefy, pump or perform some other physical action to capture qualified carbon oxide. Components of carbon capture equipment include, but are not limited to, absorbers, compressors, conditioners, cooling towers, dehydration equipment, dehydration systems, electrostatic filtration, engines, filters, fixtures, glycol contractors, heat exchangers, liquefaction equipment, lube oil systems, machinery, materials, membranes, meters, monitoring equipment, motors, mounting equipment, pipes, power generators and regenerators, pressure vessels and other vessels, processing equipment, processing plants, processing units, pumps, reboilers, recycling units, scrubbers, separation vessels, solvent pumps, sorbent vessels, specially designed flue gas ducts, support structures, tracking equipment, treating equipment, turbines, water wash equipment, and other carbon oxide-related equipment.
- iii. Excluded Components. Components of carbon capture equipment do not include pipelines, branch lines, or land and marine transport vessels used for



transporting captured qualified carbon oxide for disposal, injection or utilization. However, a gathering and distribution system that collects carbon oxide captured from a qualified facility or multiple facilities that constitute a single project for the purpose of transporting that carbon oxide away from the qualified facility or single project to a pipeline used to transport carbon oxide from multiple taxpayers or projects is carbon capture equipment.

It is noteworthy that while a single gathering and distribution system that collects and transports carbon oxide to a pipeline is considered carbon capture equipment, components related to the transportation of the carbon oxide such as the pipeline are not considered carbon capture equipment.

The broad definition created some structuring complexities where multiple taxpayers own pieces of what might be considered carbon capture equipment. The definition also created some uncertainty for industrial facilities that generate CO<sub>x</sub> as a byproduct of their operations. These would include ethanol plants, fertilizer plants and coal gasification plants. Arguably, under this definition, an investor would need to own part of the underlying plant to be eligible to obtain the credit, which is unlikely to be the intended result.

- iv. The Final Regulations. The Final Regulations significantly narrow the class of assets that is included in the definition of carbon capture equipment. Under the Final Regulations, carbon capture equipment

includes all components of property that are used to capture or process carbon oxide until the carbon oxide is transported for disposal, injection or utilization. With the exception noted below, carbon capture equipment generally does not include components of property used for transporting qualified carbon oxide for disposal, injection or utilization. The Final Regulations go on to state that carbon capture equipment is equipment used for the purpose of (i) separating, purifying, drying and/or capturing carbon oxide that would otherwise be released into the atmosphere from an industrial facility; (ii) removing carbon oxide from the atmosphere via direct air capture; or (iii) compressing or otherwise increasing the pressure of carbon oxide. Regarding components, the Final Regulations merely state that carbon capture equipment generally includes components of property necessary to compress, treat, process, liquefy, pump or perform some other physical action to capture qualified carbon oxide. The lengthy list of components that was in the Proposed Regulations has been removed.

Like the Proposed Regulations, the Final Regulations contain an exception for “a system of gathering and distribution lines” that collect carbon oxide captured from a qualified facility or multiple qualified facilities that constitute a single project.

- v. In response to comments, the Final Regulations state that carbon capture equipment that is originally placed in service at a qualified facility on or after February 9,

2018, may be owned by a taxpayer other than the taxpayer that owns the industrial facility at which the carbon capture equipment is placed in service. However, this clarification does not extend to credits granted under section 45Q(a)(1) and (2), which require carbon capture equipment that is originally placed in service at a qualified facility before February 9, 2018.

- vi. The Final Regulations do not provide specific rules regarding how to allocate any section 45Q credits generated by carbon capture equipment that captures qualified carbon oxide among multiple taxpayers that own different components within a carbon capture system or an undivided interest in the same carbon capture equipment. The preamble to the Final Regulations (the “Preamble”) states that this would create an administrative burden for the IRS. Instead, the Preamble goes on to state that multiple owners of carbon capture equipment may form a partnership to allocate § 45Q credits among themselves pursuant to Revenue Procedure 2020-12.
- vii. The 80/20 Rule. The Regulations use the same language as Notice 2020-12 to provide that a qualified facility or carbon capture equipment may qualify as originally placed in service even though it contains some used components of property, provided the fair market value of the used components of property is not more than 20 per cent of the qualified facility or carbon capture equipment’s total value (the cost of the new components of property plus the value of the used components of property). For purposes of the

80/20 Rule, the cost of a new qualified facility or carbon capture equipment includes all properly capitalized costs of the new qualified facility or carbon capture equipment. The Regulations provide that solely for purposes of the 80/20 Rule, properly capitalized costs of a new qualified facility or carbon capture equipment may, at the option of the taxpayer, include the cost of new equipment for a pipeline owned and used exclusively by that taxpayer to transport carbon oxides captured from that taxpayer's qualified facility that would otherwise be emitted into the atmosphere. Notice 2020-12 does not contain a similar election. The Regulations otherwise expressly exclude pipelines from the definition of components of carbon capture equipment. In determining the value of the used or existing component of property as compared to the new components, the general principles of Revenue Ruling 94-31 will apply. The relevant unit of retrofitted carbon capture equipment for purposes of the 80/20 Rule is an independently functioning process train. The Regulations define a "single process train" as all components that make up an independently functioning process train capable of capturing, processing and preparing carbon oxide for transport.

- viii. Qualified Facilities. To qualify for the § 45Q Credit, the qualified carbon oxide must be captured using carbon capture equipment at a qualified facility. As noted earlier, a qualified facility can be an industrial facility, a direct air capture facility, or an electricity generating facility. To be a qualified facility, construction of the

qualified facility must begin before January 1, 2026, and either construction of the carbon capture equipment must also begin prior to January 1, 2026, or the original plan and design for the facility must include installation of carbon capture equipment. The Preamble notes that the IRS and Treasury declined to provide any clarification of the meaning of “original planning and design,” as providing a definition would exceed the scope of these Final Regulations.

- ix. Industrial Facilities. There is no definition in section 45Q of the term “industrial facility.” The term “industrial facility” was defined in Notice 2020-12 as a facility that produces a carbon oxide stream from a fuel combustion source, a “manufacturing process,” or a “fugitive carbon oxide-emission source” that, absent capture and disposal or utilization, would otherwise be released into the atmosphere as industrial emission of greenhouse gas or lead to such release. Notice 2020-12 goes on to state that an industrial facility does not include a facility that produces carbon dioxide through carbon dioxide production wells from natural carbon dioxide-bearing formations. The Regulations largely follow the definition provided in Notice 2020-12. The Regulations state that electricity generating facility is included in the definition of an industrial facility. The Regulations state that a carbon dioxide production well at carbon dioxide-bearing formations or a naturally occurring subsurface spring means a well that contains 90 percent or greater carbon dioxide by volume. For other deposits, whether a well is a natural carbon

dioxide-bearing formation is determined by the facts and circumstances. The Regulations contain a very tailored exception from the exclusion from the term “industrial facility” for wells at natural carbon dioxide-bearing formations or a naturally occurring subsurface spring that contains a product other than carbon dioxide.

- x. The Regulations also define “industrial source” and “manufacturing process.” An “industrial source” is an emission of carbon oxide from an industrial facility. A “manufacturing process” is a process involving the manufacture of one or more products, other than carbon oxide, that are intended to be sold at a profit, or are used for a commercial purpose (other than producing carbon oxide). The Regulations state that “all facts and circumstances with respect to the process and products are to be taken into account.” For an excellent discussion of the types of commercial markets for CO<sub>2</sub>, see Barbara de Marigny, October 8, 2020, “Supplemental Comments in Response to Notice of Proposed Rulemaking (REG 112339-19) Regarding Section 45Q Credit for Carbon Oxide Sequestration,”
  
- xi. The definition of a manufacturing process is illustrated by two examples in the Regulations. In the example, a natural gas reservoir contains a combination of both carbon dioxide and methane in equal parts that is not usable unless separated. The taxpayer constructs equipment to separate the gas into carbon dioxide and methane. The taxpayer sells the carbon dioxide for use in a qualified EOR project. Although some of the

methane is used to power the equipment that separates the gas, the remainder is injected back into the reservoir. In that case, because the carbon dioxide is the only product manufactured that is intended to be sold at a profit or used for a commercial purpose, the example concludes that the separation process as applied to the gases is not a manufacturing process. Thus, the carbon dioxide captured is not qualified carbon oxide.

In a second example, a natural underground reservoir contains a gas that is comprised of 95 percent carbon dioxide and 5 percent helium by volume. The raw gas is not useable without the application of a separation process to create two gases that are primarily carbon dioxide and helium. The taxpayer constructs processing equipment that separate the raw gas into carbon dioxide and helium. The helium is sold to various customers for use in commercial and industrial applications. The carbon dioxide is sold to a third party for use in an EOR project. Any carbon dioxide which is returned by the third party is returned to the reservoir or vented.

Because the extraction of the helium is economically viable even if there were no commercial market for carbon dioxide or any § 45Q credit, the reservoir will not be considered a natural carbon dioxide-bearing formation or a naturally occurring subsurface and the separation process is a manufacturing process. The taxpayer may claim the § 45Q credit with respect to the carbon dioxide sold to the third party for use in EOR.

- xii. Direct Air Capture Facilities. Under the Regulations, a direct air capture facility means any facility that uses carbon capture equipment to capture carbon oxide directly from the ambient air. However, as previously noted, for purposes of direct air capture, carbon oxide is limited to carbon dioxide. Neither the definition of a direct air capture facility under the Regulations nor under § 45Q includes any facility that captures carbon dioxide (1) that is deliberately released from naturally occurring subsurface springs or (2) using natural photosynthesis.
  
- xiii. Electricity Generating Facility. The term “electricity generating facility” is limited to facilities described in § 45Q(d)(2)(A) and (B) and that are subject to depreciation under particular MACRS Asset Classes. Section 45Q(d)(2)(A) describes a facility that emits not more than 500,000 metric tons of carbon oxide, captures not less than 25,000 metric tons of carbon oxide and utilizes the qualified carbon oxide in a manner described in § 45Q(f)(5) (which describes eligible uses of CO<sub>x</sub>). Section 45Q(d)(2)(B) describes larger facilities, which must capture 500,000 or more metric tons of qualified carbon oxide. The applicable MACRS Asset Classes are those applying to (i) Electric Utility Hydraulic Production Plants, (ii) Electric Utility Nuclear Production Plants, (iii) Electric Utility Steam Product Plants or (iv) Electric Utility Combustion Turbine Production Plants.
  
- xiv. Qualified Enhanced Oil or Natural Gas Recovery Project. The term “qualified enhanced oil or natural gas



recovery project” has the same meaning as “qualified enhanced oil recovery project” under § 43(c)(2) and Reg. §1.43-2 but substituting “crude oil or natural gas” for “crude oil.” Qualified enhanced oil or natural gas recovery projects are required to be certified pursuant to the requirements of Reg. §1.43-3. Because Reg. §1.43-3 only addresses enhanced oil recovery and not natural gas recovery, the certification requirements are modified to specifically address natural gas projects. Additionally, both the petroleum engineer’s certification and the operator’s continued certification must include an additional statement that the certification is for purposes of the § 45Q carbon oxide sequestration tax credit.

The petroleum engineer’s certification must be attached to a Form 8933 and filed not later than the last date prescribed by law (including extensions) for filing the operator’s or “designated owner’s” Federal income tax return or Form 1065 for the first taxable year in which qualified carbon oxide is injected into the reservoir. Under Reg. §1.43-3(a)(2), the operator may designate any other operating mineral interest owner (the “designated owner”) to file the petroleum engineer’s certification.

The operator’s continued certification of a project must be attached to a Form 8933 (or successor form) and filed not later than the last date prescribed by law (including extensions) for filing the operator’s or designated owners’ Federal income tax return or Form 1065 for taxable years after the taxable year for which

the petroleum engineer's certification is filed but not after the taxable year in which injection activity ceases and all injection wells are plugged and abandoned.

- b. The Placed In-Service Election. As noted above, under § 45Q(f)(6)(A), for any taxable year in which an “applicable facility” captures not less than 500,000 metric tons of qualified carbon oxide during the taxable year, a taxpayer may elect to have such facility, and any carbon capture equipment placed in service at such facility, deemed as having been placed in service on the date of the enactment of BBA. The Regulations clarify that the election is made by the person that owns the carbon capture equipment and physically or contractually ensures the capture and disposal, injection or utilization of such qualified carbon oxide.
- i. Section 45Q(f)(6)(B) defines the term “applicable facility” as a qualified facility (i) that was placed in service before the date of the enactment of BBA and (ii) for which no taxpayer claimed a credit under § 45Q in regards to such facility for any taxable year ending before the date of the enactment of the BBA.
- ii. The taxpayer makes a section 45Q(f)(6) election by filing a statement of election with the taxpayer's income tax return for each taxable year in which the credit arises. The section 45Q(f)(6) election must be made in accordance with Form 8933 filed with the taxpayer's Federal income tax return for *each* taxable year in which the taxpayer makes the section 45Q(f)(6) election.

- iii. Under the Proposed Regulations, it was unclear whether the election had to be made once, or whether it had to be made every year.

XXI. Reg. § 1.45Q-3: Secure Geological Storage.

- a. Reg. § 1.45Q-3 defines the term “secure geological storage.”
  - i. Under the Regulations, the definition of “secure geological storage” is tied to existing environmental rules for geologic sequestration of carbon dioxide. The injection of carbon oxide into any underground reservoir, onshore or offshore under submerged lands within the United States requires the operator to comply with Underground Injection Control program regulations and to obtain appropriate UIC well permits. The UIC program was developed pursuant to the EPA’s rulemaking authority under the Safe Drinking Water Act. The UIC program has six classes of injection wells, based on various factors, such as the type and depth of the injection activity and the risk to a source of drinking water.
  - ii. As noted above, IRS Notice 2009-83 states that taxpayers claiming the 45Q Credit must comply with the Final Mandatory GHG Reporting Rule (or any successor rule) regarding the monitoring and reporting of emissions in order to qualify for the § 45Q Credit. The EPA promulgated final rules regarding the reporting of both CO<sub>2</sub> emissions and CO<sub>2</sub> use (including sequestration) for years after 2010. Prior to the Proposed Regulations, the IRS position was that operators of facilities that are sequestering CO<sub>2</sub> in

geologic storage must comply with Subpart RR regardless of whether the CO<sub>2</sub> is currently used as a tertiary injectant in an EOR project or disposed of in geological storage.

- iii. The Regulations modify the reporting requirements. They provide different rules for CO<sub>x</sub> that is used as a tertiary injectant and CO<sub>x</sub> that is not used as a tertiary injectant.
- iv. Where CO<sub>x</sub> is injected into a well that (i) complied with the applicable Underground Injection Control or other regulations, located onshore or offshore under submerged lands within the territorial jurisdiction of States or federal waters disposed and (ii) is not used as a tertiary injectant in an enhanced oil or natural gas recovery project, the operator must comply with Subpart RR, or
- v. Where CO<sub>x</sub> is injected into a well that (i) complies with Underground Injection Control or other regulations, is located onshore or offshore under submerged lands within the territorial jurisdiction of States or federal waters and (ii) is used as a tertiary injectant in an enhanced oil or natural gas recovery project, the operator has the flexibility to choose between complying with Subpart RR or using the standard adopted by the International Organization for Standardization and endorsed by the American National Standards Institute, CSA/ANSI ISO 27916:19 (the "ISO Standard"). In general, reporting under the ISO Standard uses mass balance accounting, has

established reporting and documentation requirements, and includes requirements for documenting a monitoring program and a containment assurance plan.

- b. The information regarding volumes of carbon oxide for qualified enhanced oil or natural gas recovery projects must be certified by the taxpayer or a third party. See Reg. § 1.45Q-3(d).
  - i. A taxpayer that reported volumes of carbon oxide to the EPA pursuant to Subpart RR may self-certify the volume of carbon oxide claimed for purposes of section 45Q.
  - ii. Alternatively, if a taxpayer determined volumes pursuant to CSA/ANSI ISO 27916:19, the taxpayer may prepare documentation as outlined in CSA/ANSI 27916:2019 internally, but all such documentation must be provided to a qualified independent engineer or geologist, who then must certify that the documentation provided, including the mass balance calculations as well as information regarding monitoring and containment assurance, is accurate and complete. The qualified independent engineer or geologist must be registered or certificated in any State. The certification must contain an affidavit from the certifying engineer or geologist state that he or she is independent from the taxpayer and, if a section 45Q(f)(3)(B) election has been made, the affidavit must state that he or she is independent from both the election taxpayer and the credit claimant.

- iii. Certifications for each taxable year must be submitted and under penalties of perjury.
- iv. Taxpayers must file Form 8933 with a timely filed Federal income tax return or Form 1065, by the due date of the federal income tax return or Form 1065 on which the § 45Q credit is claimed, including extensions.
- v. No section 45Q credit is allowed for any taxable year for which the taxpayer (including credit claimants) has failed to timely submit complete documentation and certification that is required under Reg. § 1.45Q-4 or Form 8933. The credit will only be allowed for a taxable year for which complete documentation and certification has been timely submitted.
- vi. Certifications for each taxable year must be submitted by the due date of the federal income tax return or Form 1065 on which the section 45Q credit is claimed, including extensions.

XXII. Reg. § 1.45Q-4: Utilization

- a. As noted above, taxpayers may also receive a credit for qualified carbon oxide is that is utilized in the manner specified § 45Q(f)(5). Section 45Q(f)(5)(A) provides that, for purposes of § 45Q, utilization of qualified carbon oxide means (i) the fixation of such qualified carbon oxide through photosynthesis or chemosynthesis, such as through the growing of algae or bacteria, (ii) the chemical conversion of such qualified carbon oxide to a material or chemical compound in which such qualified carbon oxide is securely stored, or (iii) the use of

such qualified carbon oxide for any other purpose for which a commercial market exists (with the exception of use as a tertiary injectant in a qualified enhanced oil or natural gas recovery project), as determined by the Secretary.

- b. Section 45Q(f)(5)(B) provides a methodology to determine the amount of qualified carbon oxide utilized by the taxpayer. This amount is equal to the metric tons of qualified carbon oxide which the taxpayer demonstrates were (i) captured and permanently isolated from the atmosphere, or (ii) displaced from being emitted into the atmosphere, through use of a process described above. The Proposed Regulations reserved on the submission of the LCA and the standard of adequate life cycle analysis.
- c. Reg. § 1. 45Q-4 sets forth rules for qualification of the credit on the basis of utilization of the carbon oxide. Section 45Q requires that measurement of the amount of carbon oxide utilized by the taxpayer turns on the preparation and approval of a lifecycle analysis (“LCA”).
- d. Under the Regulations, the taxpayer measures the amount of carbon oxide captured and utilized through a combination of direct measurement and LCA. The report must be prepared in conformity and contain documentation consistent with the International Organization for Standardization (ISO) 14044:2006, “Environmental management — Life cycle assessment — Requirements and Guidelines.” The LCA may consist of direct and indirect data in conformity with ISO 14040:2006 and 14044:2006.
- e. The LCA must demonstrate that the proposed process results in a net reduction of carbon dioxide equivalents “when

compared to a comparison system.” The Preamble states that taxpayers must use the NETL’s CO<sub>2</sub> Utilization Guidance Toolkit, including the guidance and data available on DOE’s website at <https://www.netl.doe.gov/LCA/CO2U>. Further, for purposes of the § 45Q credit, taxpayers must continue to use the NETL’s CO<sub>2</sub> Utilization Guidance Toolkit, including the guidance and data available on DOE’s website at <https://www.netl.doe.gov/LCA/CO2U>, until such time as additional guidance is developed by the DOE or another federal agency.

- f. The results of the LCA must be documented in a written LCA report. The LCA report must be performed or verified by an independent third party. The LCA report must provide a statement documenting the qualifications of the third party, including proof of appropriate U.S. or foreign professional license, and an affidavit from the third party stating that it is independent from the taxpayer. If an independent third-party review is conducted, then it must include an assessment of the model and supporting data
- g. The taxpayer must submit the written LCA report and the third-party independent statement to the IRS and the Department of Energy. The taxpayer must also submit the model if the LCA is not verified by an independent third-party review.
- h. The LCA will be subject to a technical review by the DOE, and the IRS, in consultation with the DOE and the Environmental Protection Agency, will determine whether to approve the LCA. The IRS will determine whether to approve the LCA and will notify the taxpayer. The taxpayer must receive approval of its LCA prior to claiming the section 45Q credits for such



taxable year on any federal income tax return. In addition to receiving approval of its LCA, the taxpayer must satisfy all other requirements of section 45Q and regulations sections 1.45Q-1, -2 and -4, to be eligible to claim section 45Q credits.

- i. The Preamble notes the Final Regulations do not require that the LCA be made public and further states that the LCA report may contain confidential business information. As the DOE and the IRS review LCAs, the Treasury Department and the IRS will consider providing guidance regarding common fact patterns.
- j. The Proposed Regulations did not define one of the most important aspects of § 45Q, namely the criteria for determining whether there is a commercial market.
- k. The Final Regulations address the commercial market issue by stating that a commercial market means a market in which a product, process or service that utilizes carbon oxide is sold or transacted on commercial terms. The taxpayer is required to substantiate that a commercial market exists with an attachment to Form 8933.

### XXIII. Reg. § 1.45Q-5: Recapture

- a. Under the Proposed Regulations, a recapture event occurs when qualified carbon oxide for which a § 45Q Credit has been claimed “ceases to be captured, disposed of, or used as a tertiary injectant” during the recapture period. Qualified carbon oxide ceases to be captured, disposed of or used as a tertiary injectant if the leaked amount of qualified carbon oxide in the taxable year exceeds the amount of qualified carbon

oxide disposed of in secure geological storage or used as a tertiary injectant in that same taxable year. Recapture events are determined separately for each project involving capture, disposal or use of qualified carbon oxide as a tertiary injectant, meaning a recapture event at one project will not cause a recapture of § 45Q Credits claimed in connection with a different project. No recapture occurs if the leakage occurs as a result of activity unrelated to the selection, operation or maintenance of the storage site, such as a volcano or a terrorist attack.

- b. The recapture period begins on the date of first injection of qualified carbon oxide for disposal in secure geological storage or use as a tertiary injectant. The recapture period ends on the earlier of three years after the last taxable year in which the taxpayer claimed a § 45Q Credit or the date monitoring ends under the requirements of Subpart RR for carbon oxide disposed of in secure geological storage or either Subpart RR or the ISO Standard, as applicable, for carbon oxide used as a tertiary injectant (the “post-credit-claiming period”). Although this definition of recapture period extends for a maximum period of fifteen years, the calculation of the recapture uses a last-in-first-out (LIFO) method that only extends to a maximum of the third preceding year (the “lookback period”). Thus, a § 45Q Credit claimed by a taxpayer in any particular year is only subject to recapture for the three years following the year in which the § 45Q Credit was claimed, or, if shorter, until the date monitoring ends under Subpart RR or the ISO Standard, as applicable.
- c. Any recapture amount must be considered in the taxable year in which it is identified and reported. If the leaked amount of

qualified carbon oxide does not exceed the amount of qualified carbon oxide disposed of in secure geological storage or used as a tertiary injectant in the taxable year reported, there is no recapture amount and no further adjustments to prior taxable years are needed. The taxpayer must add the recapture amount to the amount of tax due in the taxable year in which the recapture event occurs.

- d. The Regulations illustrate application of the rule with several examples.
- e. In one example, Taxpayer A owns a qualified facility that captures qualified carbon dioxide, to Operator B, an operator of an enhanced oil recovery project. Taxpayer A captured 100,000 metric tons of carbon dioxide in 2021, 2022, 2023 and 2024 that was sold to Operator B and used as a tertiary injectant in an enhanced oil recovery project. However, in 2024 Operator B determined that 10,000 metric tons of carbon dioxide injected in 2021 had leaked from the containment area. Because the 10,000 metric tons of leakage in 2024 does not exceed the 100,000 metric tons of carbon dioxide captured in 2024, Taxpayer A reduces the amount of the § 45Q Credit claimed in 2024 from 100,000 metric tons to 90,000 metric tons. See Reg. § 1.45Q-4)(g)(6), Example 1.
- f. In a variation of the example, in 2025, Operator B had injected no carbon dioxide, but determines that 190,000 metric tons of qualified carbon dioxide injected in 2021 and 2022 have leaked. There is no current year § 45Q Credit to offset. Instead, Taxpayer A must calculate the recapture amount using the LIFO method, starting with the remaining 90,000 metric tons captured in 2024 and next the 100,000 metric tons

captured in 2023. The recapture of the 90,000 metric tons in 2024 is multiplied by the 2024 statutory rate per metric ton (\$30.07) and the recapture of the 100,000 metric tons in 2023 is multiplied by the 2023 statutory rate per metric ton (\$27.61) for a total recapture amount of \$5,467,300. The recapture amount is added to Taxpayer A's tax due for 2025. See Reg. § 1.45Q-4)(g)(6), Example 2.

- g. If there is a recapture event in which the leaked qualified amount of carbon oxide had been captured from multiple units of carbon capture equipment that were not under common ownership, the recapture amount must be allocated on pro rata basis amount by the multiple units of carbon capture equipment. All taxpayers that claimed the credit are responsible for adding the recapture amount to their tax due in the taxable year in which the recapture event occurs.
- h. If there is a recapture event where the leaked amount of qualified oxide is deemed attributable to qualified carbon with respect to which multiple taxpayers claimed a portion of the § 45Q credit, the recapture amount must be allocated on a pro rata basis among the taxpayers that claimed the § 45Q credit calculated by respect to the qualified carbon oxide to which the leaked qualified carbon oxide is deemed attributable. The Regulations provide examples illustrating the effect of this rule where the facility was sold prior the recapture event and alternatively where an election was made to transfer the credit under § 45Q(f)(3)(B). See Reg. § 1.45Q-4)(g)(6), Examples 3 and 4.
- i. If a partnership is one of the multiple taxpayers that claimed section 45Q credit amounts, the partnership and not its

partners will be the taxpayer to which the pro rata recapture amount must be allocated. The partnership must allocate the pro rata amount among its partners in accordance with regulations section 1.704-1(b)(4)(ii). If the partnership terminates under section 708(b)(1) prior to a recapture event, the partners of that terminated partnership at the time the section 45Q credit was claimed will be the taxpayers to which the pro rata recapture amount must be allocated.

- j. If a recapture event occurs during a project's recapture period, any taxpayer that claimed a § 45Q credit for that project must report the following information:
  - A. The recapture amount;
  - B. The leaked amount of qualified carbon oxide (in metric tons);
  - C. The statutory credit rate(s) at which the § 45Q credits were previously claimed; and
  - D. A statement that describes how the taxpayer became aware of the recapture event, how the leaked amount was determined, and the identify and involvement of any regulatory agencies.

#### XXIV. Conclusion.

- a. The guidance provided by the combination of the Notice 2020-12, Rev. Proc. 2020-12 and the Regulations are a significant step in developing the CCUS industry.
- b. Perhaps overshadowing the Regulations are the provisions that are contained in the Consolidated Appropriations Act (the Act"). [BILLS-116hr133enr.pdf \(govinfo.gov\)](#). Title IV of the Act, entitled "Carbon Management" contains numerous provisions aimed at reducing the carbon footprint. Eight

provisions are added (Sections 4001 to 4008). Title V of the Act, entitled “Carbon Removal” contains two provisions (Sections 5001 to 5002).

- c. Section 5001. Among these is authorization in Section 5001 of \$447,000,000 for research, improve technologies and strategies to remove carbon dioxide from the atmosphere on a large scale. The Secretary of Energy is required to establish a prize competition for direct air capture technology and shall award prizes under the prize competition to qualified direct air capture facilities for metric tons for qualified carbon oxide captured and stored in saline storage formation, enhanced oil recovery and other activities that are consistent with Section 45Q(f)(5).
- d. Section 5002. Section 5002 of Act requires not later than 180 days after the date of enactment of this Act, the Secretary of Energy, in consultation with the heads of any other relevant Federal agencies, shall prepare a report that— (1) estimates the magnitude of excess carbon dioxide in the atmosphere that will need to be removed by 2050 to achieve net-zero emissions and stabilize the climate; (2) inventories current and emerging approaches of carbon dioxide removal and evaluates the advantages and disadvantages of each of the approaches; and (3) identifies recommendations for legislation, funding, rules, revisions to rules, financing mechanisms, or other policy tools that the Federal Government can use to sufficiently advance the deployment of carbon dioxide removal projects.

## **Appendix A**

	Disposed in Secure Geological Storage (Sequestration)	Tertiary Injectant (EOR) or any other purpose
2017	\$22.66	\$12.83
2018	\$25.70	\$15.29
2019	\$28.74	\$17.76
2020	\$31.77	\$20.22
2021	\$34.81	\$22.68
2022	\$37.85	\$25.15
2023	\$40.89	\$27.61
2024	\$43.92	\$30.07
2025	\$46.96	\$32.54
2026	\$50.00	\$35.00
2027 and after	\$50.00 plus an inflation adjustment	\$35.00 plus an inflation adjustment