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Future of Carbon Capture Looks Bright After Treasury Proposes Long-Awaited Regulations

The Treasury Department and the IRS provided practical administrative rules for the carbon capture and sequestration tax credit.

Key Points:

- These rules are the third in a series of regulatory guidance issued by the IRS and are intended to propel the growth of the carbon capture and sequestration industry in the US.
- The guidance, issued in proposed form, covers topics of great importance to the industry, including how to comply with the secure geological storage requirement, how to transfer the tax credits from the capturing party to the sequestering party, and the scope of potential tax credit recapture in the event of a leak of carbon oxide.
- Industry participants have until August 3, 2020, to comment on certain key aspects of the proposed regulations, including the definition of "commercial markets."
- For geological storage of carbon oxide through enhanced oil recovery, the IRS created the option to establish "secure geological storage" by following one of two permissible methods.

On May 28, 2020, the IRS released the long-awaited third piece of carbon capture, utilization, and sequestration (CCS) tax credit guidance in the form of proposed Treasury Regulations (Proposed Regulations) addressing many remaining issues applicable to the tax credit for CCS under Section 45Q (45Q Credit).The Proposed Regulations follow the February 19, 2020, release of Notice 2020-12, in which the IRS explained the requirements for beginning construction on a carbon capture facility, and Revenue Procedure 2020-12, which provides a safe harbor template for allocating the 45Q Credit in tax equity partnerships. The magnitude of 45Q Credits now available to the carbon capture industry is likely to lead many projects to seek tax equity investors to monetize the 45Q Credit. For more information, see Latham & Watkins' *Client Alert* Carbon Capture Industry Receives Long-Awaited 45Q Tax Credit Guidance.

The new rules fill in some of the important details that Congress delegated to the IRS when the 45Q Credit rules were expanded in February 2018. The Proposed Regulations clarify the types of carbon capture activities that qualify for the 45Q Credit and provide flexibility for owners of carbon capture equipment to pass through the 45Q Credit to other participants involved in the sequestration process. This "pass-through" election may allow some owners of carbon capture equipment to bypass the complex tax equity market and monetize their 45Q Credit directly with the party that sequesters the carbon.

The Proposed Regulations also provide detailed rules on how to comply with the requirement that captured carbon oxide be sequestered in secure geological storage, and outline the circumstances when the 45Q Credit may be recaptured if carbon oxide is released to the atmosphere after being sequestered. Notably, the 45Q Credit recapture period is limited to five years and provides exceptions for uncontrollable emission events, offering greater certainty to tax equity investors who were concerned by the prospect of a recapture period of unlimited scope and duration.

This guidance, taken as a whole, should provide developers and financiers the clarity needed to successfully bring carbon capture and sequestration projects to market.

CCS is not new, and a number of companies in the United States have been actively capturing and sequestering carbon dioxide for more than 30 years, most notably large oil and gas producers as part of a process referred to as enhanced oil recovery (EOR). Most of the near-term opportunities in the market are expected to involve carbon capture used as part of EOR, and accordingly this *Client Alert* begins with a summary of the EOR process and then provides further analysis of the 45Q Proposed Regulations.

CCS and Enhanced Oil Recovery

The extraction of oil and gas from subsurface reservoirs occurs in several phases. The first producing phase, known as primary recovery, involves oil and gas being “driven” through natural reservoir mechanisms, mainly through the pressure differential between the producing reservoir and the wellbore. Recovery of hydrocarbons during the primary phase is relatively low, typically around 10% for oil reservoirs. The secondary recovery phase involves the supply of external energy to the producing reservoir to maintain (or increase) pressure in the reservoir and/or move hydrocarbons to wellbores. Secondary recovery methods typically include the injection of water or gas into the reservoir through existing (or new) injection wells, often resulting in an incremental ultimate recovery of 15% to 40% in oil reservoirs. The third phase, known as tertiary recovery or EOR, involves altering the mobility of hydrocarbons in the reservoir when secondary recovery methods are no longer effective. EOR involves the injection of a fluid that reacts with oil in the reservoir to change its properties and move it more easily within the reservoir. EOR can result in an incremental 5% to 15% of ultimate recovery from oil reservoirs.

One of the most common EOR methods is carbon dioxide flooding, whereby carbon dioxide is injected into a reservoir through existing (or new) injection wells to increase reservoir pressure and alter the viscosity of oil in the reservoir. This method allows producers to more easily sweep reservoir hydrocarbons to producing wellbores, typically by injecting water into the producing reservoir in alternating stages with the carbon dioxide. Most EOR projects are designed as closed-loop systems so that any carbon dioxide extracted together with the produced fluids stream is captured and reinjected into the oil reservoir.

Some EOR projects use “naturally occurring” carbon dioxide, which is extracted from offsite source fields, compressed, and transported via pipeline, and then used for EOR. The opportunity presented by CCS is to replace naturally occurring carbon dioxide in the EOR process for “anthropogenic” carbon dioxide as a means to reduce greenhouse gas emissions and address climate change.

The 45Q Credit for CCS

The 45Q Credit is a per-metric-ton tax credit available to owners of carbon capture equipment who capture carbon oxide from an industry facility or directly from the atmosphere and then sequester it, or first use it as a tertiary injectant in EOR and then sequester it as part of that process. The captured

carbon oxide may also be used for certain other commercial processes that result in the permanent removal of the carbon oxide.

While the 45Q Credit has been available since 2008, the credit was significantly expanded by Congress in February 2018 for carbon capture projects put into service after February 9, 2018.

Owners of carbon capture equipment may claim tax credits over a 12-year period starting when the carbon capture equipment is first put into service. There is no limit on the amount of 45Q Credits that may be claimed from any individual project or from the industry as a whole.

The amount of the 45Q Credit is based on the quantity of carbon oxide captured (as measured in metric tons) and generally depends on whether the carbon capture equipment was first installed before or after February 9, 2018, and the use to which the carbon oxide is put after it is captured.

The 45Q Credit increases each year through 2026 on a linear basis and generally depends on whether the carbon oxide is sequestered in secure geological storage (disposed of), used as a tertiary injectant in an EOR project (injected) or otherwise utilized in in the commercial processes mentioned above (utilized). After 2026, the amount of the available 45Q Credit will increase by an inflation adjustment factor. The largest credit is awarded for captured carbon oxide that is disposed of without putting it to a commercial use, while a smaller, but still very significant, tax credit is available for captured carbon oxide that is injected or utilized.

The table below shows the credit available by activity in each year through 2026:

ACTIVITY	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Disposal	22.66	25.70	28.74	31.77	34.81	37.85	40.89	43.92	46.96	50.00
Injection	12.83	15.29	17.76	20.22	22.68	25.15	27.61	30.07	32.54	35.00
Utilization	12.83	15.29	17.76	20.22	22.68	25.15	27.61	30.07	32.54	35.00

Qualified Carbon Oxide

For carbon capture equipment placed in service after February 9, 2018, “qualified carbon oxide” refers to carbon oxide that is (i) measured at the source of capture and verified at the source of disposal, injection, or utilization in accordance with the Proposed Regulations, and (ii) captured either at an “industrial source” or “directly from the ambient air,” as described below.

Industrial Facility

Qualified carbon oxide includes carbon oxide captured at an “industrial source,” which is an emission of carbon oxide from an “industrial facility.” An industrial facility is a facility that emits carbon oxide from a combustion source or fuel cell, manufacturing process, or fugitive carbon oxide source that, absent capture and disposal, would otherwise be released into the atmosphere as industrial emission of greenhouse gas. A manufacturing process is one involving the manufacture of any product other than carbon oxide that is intended to be sold at a profit or used for a commercial purpose. Thus, industrial facilities include power plants, refineries, fuel cells, cement plants, and other industrial or manufacturing

sources that produce carbon oxide. Notably, industrial facilities do not include carbon dioxide production wells producing carbon dioxide from natural formations or springs. However, a formation is not considered carbon dioxide-bearing if it is a natural gas deposit containing less than 10% carbon dioxide by volume. As most natural gas wells produce less than 10% carbon dioxide by volume, this means that most carbon dioxide that is produced alongside natural gas may be eligible for 45Q Credits if captured and disposed of, injected, or utilized in sufficient quantities.

Direct Air Capture

Qualified carbon oxide also includes carbon oxide captured "directly from the ambient air" at so-called "direct air capture facilities."

Qualified Carbon Capture Facilities

To qualify for the 45Q Credit, carbon oxide must be captured at a qualifying facility. A qualifying facility must meet two requirements: (i) a developer must begin construction on both the facility and the carbon capture equipment before January 1, 2024, or if the original planning and design of the facility includes carbon capture equipment, a developer must simply begin construction on the facility itself before January 1, 2024, and (ii) the industrial facility must meet a minimum emissions threshold. The "beginning of construction" rule was largely adopted from the tax credit rules in the renewable energy sector and liberally considers construction to have begun when physical work starts on the carbon capture equipment or when 5% of the cost of the carbon capture equipment is incurred. For more information on the beginning of construction requirements, see Latham's *Client Alert* Carbon Capture Industry Receives Long-Awaited 45Q Tax Credit Guidance.

Depending on the type of facility, it must capture certain minimum thresholds of qualified carbon oxide, as set forth below (in metric tons of carbon oxide per year):

ACTIVITY	POWER PLANT	OTHER INDUSTRIAL FACILITY	DIRECT AIR CAPTURE
Disposal	500,000	100,000	100,000
Injection	500,000	100,000	100,000
Utilization	25,000	25,000	25,000

The Proposed Regulations clarify that in the year the facility is first placed in service, an annualization calculation will ensure that the 45Q Credits are available, even if the facility is placed in service late in the year and doesn't otherwise capture the necessary quantity of carbon oxide.

Who Claims the 45Q Credit?

For carbon capture equipment placed in service on or after February 9, 2018, the default rule is that the 45Q Credit is claimed by the taxpayer that (i) owns the carbon capture equipment and (ii) physically or contractually ensures the capture and disposal, injection, or utilization of the carbon oxide. Since 2018, Section 45Q has provided that the 45Q Credit may be transferred by election to the party that disposes of, injects, or utilizes the carbon oxide. The Proposed Regulations address a number of important

questions regarding the application of the default rule and the election, including clarifying the meaning of carbon capture equipment, what it means to contractually dispose of, inject, or utilize the carbon oxide and the mechanics of the election to transfer the 45Q Credit.

Carbon Capture Equipment

As the taxpayer that owns the carbon capture equipment is the one entitled to the 45Q Credit, the most immediate question is: What is the carbon capture equipment? This question is particularly important as developers are likely to structure projects in a manner that limits the ownership of third-party tax equity investors to the equipment necessary to generate 45Q Credits. The meaning of carbon capture equipment is also important because it provides insight into planning opportunities that developers may use to ensure that construction on a project begins before 2024. Notice 2020-12 provides two methods by which a taxpayer can begin construction on a qualified facility or on carbon capture equipment — by beginning physical work of a significant nature on the qualified facility or carbon capture equipment, or by incurring more than 5% of the costs of the qualified facility or carbon capture equipment. Notice 2020-12 generally defines “carbon capture equipment” as property used to capture or process carbon oxide until it is transported away from the qualified facility.

The Proposed Regulations clarify that carbon capture equipment includes all components of property necessary to compress, treat, process, liquefy, pump, or perform some other physical action to capture carbon oxide. This includes components such as absorbers, compressors, conditioners, and cooling towers (among many other qualifying components), but does not include any transportation equipment, such as pipelines, branch lines, or vessels for transporting for disposal, injection, or utilization, other than gathering lines used to gather captured carbon at a facility prior to its transportation to the disposal or injection site. For developers linking industrial facilities to carbon sinks such as saline formations for disposal, or oil fields for injection, this means that the pipelines used to connect the source and the use of the carbon can generally be considered out of the scope of the project.

Contracting for Disposal, Injection, and Utilization

Importantly, the owner of the carbon capture equipment does not need to actually dispose of, inject, or utilize the carbon oxide itself. Instead, the owner of the carbon capture equipment may qualify for 45Q Credits by contractually ensuring disposal, injection, or utilization pursuant to one or more binding written contracts. For potential tax equity investors, the term “binding written contract” will be a familiar one. This term is used in multiple places throughout the tax laws (including in recently released regulations relating to immediate expensing of certain capital expenditures and in guidance relating to the start of construction for certain wind, solar, or carbon capture projects). A binding written contract generally requires that the contract be enforceable under state law and that it not limit damages to a specified amount. Typically, definitions of binding written contract clarify that as long as damages are not limited to less than 5% of the contract price, damages will not be considered as limited to a specified amount. This clarification is missing from the Proposed Regulations. It is unclear if this is an oversight subject to clarification when the Proposed Regulations are finalized, or if the IRS intended the term “binding written contract” to have a different meaning in this context.

These contracts must include commercially reasonable terms and provide for enforcement of the obligation to dispose, inject, or utilize the carbon oxide, and terms requiring compliance with the requirements and documentation for secure geological storage or utilization, as applicable, including prompt recapture notice to the capturing party. A significant question exists as to what will constitute commercially reasonable terms, particularly for the disposal of carbon oxide, and particularly if the party ensuring disposal is an affiliate of the entity that owns the carbon capture equipment.

Transferring 45Q Credits

The taxpayer entitled to claim the 45Q Credit may elect to allow the parties that dispose, inject, or utilize the carbon oxide to claim part or the full amount of the credit. There is no direct analogue for this transfer mechanic in other tax credits aimed at environmental sustainability, and the precise mechanics of the transfer are not set forth in the statute. The Proposed Regulations adopt a commonsense approach that permits transfers of the credits to multiple parties through an explicit election filed by both the transferor and the transferees. Thus, a project can function as a single source of carbon oxide, and in doing so satisfy the qualified facility thresholds, while effectively offering carbon oxide offtakers the ability to claim credits based on the carbon disposed of, injected, or utilized. Moreover, because the election to transfer 45Q Credits may be made on a partial basis, the capturing party may retain a portion of the credits, or may transfer different portions to transferees conducting different disposal activities (*e.g.*, a portion of the credits may be retained, a portion transferred to an oil and gas company for injection, and a portion transferred to an owner of a saline formation for disposal). Finally, the transfer election is made on an annual basis, which permits capturers significant commercial flexibility to react to changing market conditions or taxable income projections.

Disposal and Injection: Secure Geological Storage

To qualify for 45Q Credits, a taxpayer must contractually or physically dispose of or inject captured carbon oxide in "secure geological storage" (as discussed in this section) or utilize carbon oxide (as discussed in the next section).

Secure geological storage includes storage in deep saline formations, oil and gas reservoirs, and unminable coal seams. The Proposed Regulations set forth the conditions taxpayers must meet to demonstrate that carbon oxide is securely stored and will not escape to the atmosphere.

As discussed in the following three subsections, the applicable requirements depend on whether the carbon oxide is injected or disposed of. This distinction arises because injection wells used for EOR require a Class II Underground Injection Control (UIC) permit under the Safe Drinking Water Act, whereas injection for geological storage requires a Class VI permit. As discussed below, the Class II UIC program is well established, whereas the Class VI UIC program is novel and generally more stringent.

UIC Class II and Class VI Permits

Under the UIC program, the Environmental Protection Agency (EPA) regulates six classes of underground injection wells. Some of these wells, including the Class II wells, have existed for years alongside the 45Q Credit. Class II wells are used to inject fluids associated with oil and natural gas production into geological formations, including wastewater from hydraulic fracturing and fluids used for EOR. Operators have used Class II wells for years to inject naturally-occurring carbon dioxide. About 180,000 Class II wells are currently in operation throughout the United States, and as discussed below, a majority of states have been awarded primary enforcement authority ("primacy") over Class II well regulation. Class VI is the newest class of UIC permits, and was developed specifically for non-EOR geological sequestration of carbon dioxide. In contrast to Class II, to date the EPA has approved only two Class VI well permits.

Because the Class VI program is newer and contemplates permanent storage of injected fluids, the Class VI permit requires the operator to provide a significant volume of geological and hydrological data, a computational model of the area of review based on that data, and detailed plans for well construction, testing, monitoring, post-injection site care, and well closure. Applications must be evaluated and updated with substantial additional testing and monitoring data in an iterative process after submission. The

applicant works closely with the EPA during the application review process, which may take up to 18 months.

A final UIC permit authorizes construction of the well but not injection of carbon oxide. After constructing the well, the permittee must submit additional testing and drilling information acquired during construction, and provide updates to associated plans, before the EPA will authorize injection. The EPA must be satisfied that the permittee has met the applicable requirements for injection. Moreover, in addition to the general requirements for all UIC permits, the EPA must evaluate a Class VI well under technical requirements specific to Class VI permits. Those EPA regulations set forth requirements for geological site characterization, area of review and corrective action, financial responsibility, well construction, operation, mechanical integrity testing, monitoring, well plugging, post-injection site care, and site closure of Class VI wells.

Greenhouse Gas Reporting Requirements

Both Class II and Class VI permit holders are subject to the EPA's greenhouse gas reporting requirements set forth at 40 CFR part 98. However, Class II permit holders are subject to subpart UU of 40 CFR 98 (Subpart UU), which requires only reporting of basic information on carbon dioxide received for injection. In contrast, the Class VI program requires permit holders to comply with 40 CFR Part 98 subpart RR (Subpart RR) and develop a Monitoring, Reporting, and Verification (MRV) plan that provides for reporting, monitoring, and verification of the amount of carbon dioxide sequestered using a mass balance approach. In addition, the MRV plan must include a delineation of the maximum monitoring area and active monitoring areas, identification of potential surface leakage pathways for carbon dioxide, a strategy for detecting and quantifying surface leakage, a strategy for establishing the expected baselines for monitoring carbon dioxide leakage, and a summary of considerations used in calculating a mass balance equation.

Under current law, taxpayers must have an MRV plan approved by the EPA to quality for 45Q Credits. Class VI permit holders will have obtained such a plan as part of the permit application process, but Class II holders will need to obtain an MRV plan under Subpart RR in addition to the Class II permit. Commenters argued that compliance with Subpart RR is excessively burdensome, and may not align with state and local regulations or industry practices. Because Subpart RR was viewed as excessively burdensome, the IRS permitted Class II permit holders the choice to demonstrate secure geological storage by complying *either* with Subpart RR *or* with standards issued by the International Organization for Standardization (ISO) for carbon dioxide sequestration under CSA/ANSI ISO 27916:19 (ISO 27916:19).

ISO 27916:19 was developed for the purpose of quantifying volumes of carbon dioxide sequestered through EOR. Like Subpart RR, ISO 27916:19 also employs mass balance accounting, and includes requirements for annual reporting, recordkeeping, monitoring, and leak prevention. However, Subpart RR, like the EPA's greenhouse gas reporting program, makes reported data public. ISO 27916:19 contains no such requirement, although taxpayers complying with ISO 27916:19 will still need to report basic information under Subpart UU.

One advantage of Subpart RR is that taxpayers may self-certify the volume of carbon oxide claimed for purposes of 45Q Credits. Taxpayers who rely on the ISO 27916:19 standards, however, must have ISO 27916:19 reporting documentation certified as accurate and complete by a qualified independent engineer or geologist. The approach taken by the Proposed Regulations is intended to provide taxpayers using carbon oxides as a tertiary injectant more flexibility by not requiring an EPA-approved MRV plan.

State Programs

In the Proposed Regulations, the IRS rejected suggestions by commenters to allow use of state-level programs, such as California's Low Carbon Fuel Standard (LCFS), as a compliance alternative to Subpart RR and the ISO 27916:19. Many CCS project developers are expected to attempt to leverage both the 45Q Tax Credit and LCFS program to maximize revenue streams. Accordingly, developers will have to comply separately with each of the Proposed Regulations and the requirements contained in the LCFS protocol.

Utilization

In addition to geological storage, a taxpayer may qualify for 45Q Credits by ensuring the utilization of carbon oxide in certain ways permitted by the statute, which is intended to foster technology developments in non-traditional oil and gas sectors. The Proposed Regulations define "utilization" of carbon oxide as: (i) fixation through photosynthesis or chemosynthesis, such as through the growing of algae or bacteria; (ii) chemical conversion to a compound in which such carbon oxide is securely stored; or (iii) use for any other purpose for which a "commercial market exists" (with the exception of use in tertiary injection for purposes of an EOR project, which falls under the "secure geological storage" discussed above). However, the Proposed Regulations notably do not define "commercial markets," and the IRS is requesting additional comments on this point.

45Q Credit Recapture

Section 45Q provides that the 45Q Credits will be subject to recapture to the extent carbon oxide ceases to be disposed of, injected, or utilized within the meaning of Section 45Q. However, the statute requires regulations to define the scope and timing of recapture. The Proposed Regulations adopt a generally workable approach to recapture.

The 45Q Credits are subject to recapture when they cease to be captured, disposed of, or injected during the recapture period (including by intentional removal). This occurs when the amount of carbon oxide leaked exceeds the amount injected or stored in a given year, though there is an exception for force majeure-type events, such as volcanic activity or a terrorist attack. Notably, the Proposed Regulations do not indicate that seismic activity would be considered a force majeure event, likely because injection of carbon dioxide is known to trigger seismic activity in certain circumstances. The period during which a taxpayer is subject to recapture extends from the date of first injection and ends at the earlier of five years after the last taxable year the 45Q Credit was claimed or the date monitoring ends under Subpart RR or ISO 27916:19. The five-year recapture period is consistent with the recapture period applicable to the investment tax credit, and will be well understood by tax equity investors negotiating financings of carbon capture equipment.

The Proposed Regulations provide a number of mechanical rules to help taxpayers calculate recapture amounts. Perhaps the most notable of these is that recapture is deemed to occur on a last-in, first-out (LIFO) basis — it is first applied to the most recent prior taxable year, and so on, up until the fifth preceding year — and therefore the 45Q Credits of the highest value are generally recaptured first.

Conclusion

The Proposed Regulations address many of the open questions that needed answers to attract investment capital to carbon capture and sequestration projects. Together with Notice 2020-12 and Revenue Procedure 2020-12, the Treasury Department and the IRS have provided a workable framework around which developers can proceed with project development and financing. Taxpayers are generally permitted to apply and rely on the Proposed Regulations with respect to tax years beginning on or after

February 9, 2018. The Treasury Department and the IRS have requested comments on the Proposed Regulations by August 3, 2020, including comments regarding the definition of commercial markets and standards for lifecycle emissions, the application of the recapture provisions to 45Q Credits that are carried forward to future tax years, and the consistent application of the rules to similarly situated taxpayers.

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