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Internal Revenue Service
CC:PA:LPD:PR (REG-112339-19)
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Re: Supplemental Comments in Response to Notice of Proposed Rulemaking (REG 112339-19) Regarding Section 45Q Credit for Carbon Oxide Sequestration

Ladies and Gentlemen:

At the IRS hearing held August 26, 2020, on the Notice of Proposed Rulemaking REG 112339-19 regarding section 45Q Credit for Carbon Oxide Sequestration (the "NPRM"), we presented some of our comments regarding the proposed regulations which we had submitted on August 3, 2020. Government representatives participating in the hearing requested that we submit additional written comments on two topics we presented at the hearing:

(i) the determination of the baseline for the lifecycle analysis (the "LCA") that, under section 45Q(f)(5), is required to be prepared in the case of utilization of captured carbon oxide; and
(ii) the manner of determination of the existence of commercial markets for purposes of section 45Q(f)(5)(A)(iii).

Our supplemental comments on these topics are presented below.

We again applaud the IRS and Treasury for their hard work in grappling with difficult issues to provide the extensive guidance reflected in the NPRM. We appreciate the opportunity to comment on the proposed regulations. Our comments are offered in the spirit of ensuring that implementation of the guidance provides the certainty needed to incentivize CCUS activity.

Outline of Comments

I. LCA Baseline

A. Background

Prop. Reg. section 1.45Q-4(c)(2) provides: "The measurement and written LCA report must be performed by or verified by an independent third-party. The report must contain documentation consistent with [ISO] 14044:2006." Prop. Reg. section 1.45Q-4(e), entitled "Standards of adequate lifecycle analysis" is "Reserved."

The NPRM, in the Preamble, states that, in response to the comments previously submitted on the topic of LCAs:

> The Treasury Department and the IRS, in consultation with the EPA and the DOE, concluded that the LCA must be in writing and either performed or verified by a professionally-licensed third party that uses *generally-accepted standard practices* of quantifying the greenhouse gas emissions of a product or process and *comparing that impact to a baseline*. . . .The Treasury Department and the IRS *request comments on how to achieve consistency in boundaries and baselines* so that similarly situated taxpayers will be treated consistently. . . . The proposed regulations do not define commercial markets or provide for Standards of Lifecycle Analysis. The Treasury Department and the IRS continue to study these issues and request comments. (Emphasis added.)[1]

Our written comments submitted August 3, 2020, responded to the request for comments with respect to boundaries for LCAs but did not speak to the question of baselines for LCAs.[2] Our comments at the hearing raised a particular issue with respect to the determination of baselines, which is described below, along with a proposed resolution and draft examples illustrating application of the proposed resolution.

B. Concept of "Baseline"

The NPRM Preamble uses the term "baseline" to refer to the process against which the carbon capture and utilization process is tested or compared in order to determine the greenhouse gas (GHG) effect of the process.[3] It is easy to identify the baseline if a taxpayer proposes to install carbon capture equipment and change its production process to use captured carbon oxide. In that case, the baseline would be the existing process that does not use captured

[1] NPRM, p. 29.

[2] There has been almost no discussion of baselines in submitted comments. One commenter suggested that "taxpayers should use an LCA that compares a base case of making the product produced by utilization without carbon capture to the modeled utilization case using qualified carbon oxide to determine what greenhouse gases were displaced from being emitted into the atmosphere." See comments submitted by Stratex Ventures, LLC, accessed at: https://beta.regulations.gov/comment/IRS-2019-0026-0054. See also comments submitted on behalf of Loci Controls, Inc., p. 15, accessed at https://beta.regulations.gov/comment/IRS-2020-0013-0038.

[3] The term "baseline" is not defined in ISO 14044:2006 and, in fact, is only mentioned once, in section 4.4.3.2.2, as an example of an alternative scenario that may be needed for inclusion of "normalization" as an optional element of the LCA. Section 5.3.1. of the ISO standard provides that, for LCA studies supporting comparative assertions intended to be disclosed to the public (which we presume would be the case for an LCA supporting a claim under section 45Q), there must be a description of the equivalence of the systems being compared in accordance with section 4.2.3.7 of the ISO standard. Section 4.2.3.7 provides that, in a comparative study, the scope of the study shall be defined in such a way that the systems can be compared using the same function unit and equivalent methodological considerations, such as performance, boundary, inputs and outputs. The NETL LCA guidance toolkit posted by the DOE for carbon utilization LCAs also does not define the term "baseline" and describes the system against which comparison is made as the "comparison process" in section 2.1.3.2. Other comments to the proposed guidance refer to the baseline as the "base case" or "the incumbent process."

carbon and the LCA would compare the GHG emissions from the new or proposed process to the GHG emissions of the former process that has, or is proposed to be, changed. The function of the LCA would be to identify and measure the change in GHG emissions between the baseline process and the proposed process.

C. Change of Process Should Not Be Required

Some LCA templates or models suggest, however, that the LCA must compare the tested process (the carbon capture and utilization) to the taxpayer's (or the taxpayer's industry's) historic alternative process that does not involve carbon capture and utilization. This may be due to the use of templates designed for use in LCAs that are being prepared in connection with government funded projects for the development of new CCUS technologies in order to compare the carbon footprint of new technologies to that of current, conventional technologies, meaning a change in technology or process.[4]

Section 45Q does not, however, condition a valid claim to the credit on a *change* in a current process of carbon capture and utilization. Section 45Q(f)(5) does not require that the utilization of captured carbon be a new process for the taxpayer; the taxpayer must simply measure the amount utilized through a combination of direct measurement and the LCA. Section 45Q is designed to incentivize carbon capture activity but the credit is available for qualifying carbon capture and utilization activity regardless of whether the activity is new to the taxpayer.[5] The credit can be claimed for utilizing captured carbon in making a product regardless of whether the taxpayer has switched from some other means of making the product. In order to incentivize the installation of carbon capture equipment, section 45Q provides for higher credit amounts for carbon oxide captured using carbon capture equipment that was placed in service post-February 9, 2018, but the credit is available for qualifying amounts captured using equipment installed before that date.[6]

Guidance in the final regulations regarding the standard for the LCA should make clear that it is not necessary for the LCA to identify as a baseline a process that was previously used by the taxpayer or the taxpayer's industry in which captured carbon was not used. We do not believe that the reference in section 45Q(f)(5) to use of an LCA was intended to import into section 45Q(f)(5) a "change of process" requirement. If the LCA were required to be prepared using a baseline that illustrates the difference from a changed process (regardless of whether the LCA

[4] The DOE posted an LCA guidance toolkit on August 30, 2019, on the National Energy Technology Laboratory (NETL) website, entitled "Carbon Dioxide Utilization Life Cycle Analysis Guidance for the U.S. DOE Office of Fossil Energy," accessible at https://www.netl.doe.gov/LCA/CO2U. The DOE's guidance toolkit is intended to provide guidance for preparing an LCA to principal investigators ("PIs") developing CCUS technologies in connection with DOE funding opportunities and is not mentioned in the proposed regulations. In Section 2.1.3.2, the NETL LCA toolkit calls for the baseline or "comparison process" used by the PI to be determined by reference to industry standard practice technology, which refers to current, conventional technology.

[5] Section 45Q(a)(2).

[6] Section 45Q(a)(2). See also section 45Q(f)(6) which deems a taxpayer that has been engaged in capturing of qualified carbon oxide to have newly placed in service equipment in order to obtain the higher per ton credit amounts.

standard is ISO 14044, the NETL template or one of the many other LCA templates and databases that are available), taxpayers that are engaged in qualifying activity but that cannot demonstrate that they previously made the product using non-captured carbon will not be able to provide an LCA that shows the GHG savings from the process they are using.

D. Baseline Should Assume Emission of Carbon Oxide

To prevent the LCA standards from importing such an unintended restriction into section 45Q, we suggest that, in developing regulations regarding the LCA standards, Treasury and the IRS give consideration to providing that the LCA should compare the capture and utilization process to a baseline in which the taxpayer sourced carbon oxide from a fossil carbon source. Such a baseline would provide an appropriate comparison for purposes of the tax credit. Using such an approach to the baseline, the captured carbon oxide used by a taxpayer's existing processes would be assumed instead to have been emitted by the industrial process from which it is captured and the taxpayer would be assumed to have acquired the carbon oxide needed for its process from a non-captured, i.e., fossil, source, such as underground deposits. Such an approach to the baseline would be consistent with the ISO 14044:2006 standard since use of such a baseline is apparently a very common framework for LCAs that fulfill ISO 14044:2006 requirements.[7]

Such a definition of the baseline would allow taxpayers who would not be making a change to their process for making their products utilizing captured carbon to identify and measure the carbon savings from their process compared to fossil carbon sources. The starting point for the LCA in such cases would be an assumption that the current process uses captured carbon that otherwise would have been emitted. If GHGs are emitted as part of the production process or if captured carbon is used to conduct the production process, such amounts would reduce the net GHG savings analyzed by the LCA but the starting point would assume that the taxpayer, by capturing and utilizing carbon, has displaced that amount from being emitted into the atmosphere.

E. Example of Suggested Baseline Approach

To illustrate the use of the proposed baseline approach, perhaps examples could be included in the regulations along the following lines, recognizing that the LCA process itself would entail more extensive additional considerations:

7 See "A Guideline for Life Cycle Assessment of Carbon Capture and Utilization," L. Muller, A. Katelhon, M. Bachmann, A. Zimmerman, A. Sternberg & A. Bardow, Frontiers in Energy Research (February 14, 2020), accessed at www.frontiersin.org/articles/10.3389/fenrg.2020.00015/full, (hereafter, "Guideline"), stating that "[T]he most common research questions [addressed by CCU LCAs] are. . . 1. What is the environmental impact reduction of a CCU-based product or service *compared to the same product or service derived from fossil carbon sources*?" (emphasis added), p.4.

Example 1:

Facts: Taxpayer produces Product A using Process A. Carbon dioxide is a by-product of Process A. Taxpayer captures the carbon dioxide by-product and then Taxpayer uses it in Process B to make Product B. The captured carbon dioxide is chemically converted and securely stored in Product B. Products A and B have been produced for many years and the Taxpayer's production of Product B has historically used carbon dioxide captured from Process A. Its production method using captured carbon dioxide from Process A to make Product B is used almost uniformly within Taxpayer's industry. Taxpayer's carbon capture equipment was placed in service before February 9, 2018. To make one unit of Product B, Taxpayer must use 1MT of carbon dioxide. In Year 1 Taxpayer captures 200,000MT of the carbon dioxide that is a by-product of Process A. Taxpayer uses the captured carbon dioxide in Process B to make 200,000 units of Product B. Taxpayer arranges for a qualified independent third party to verify its measurements of the amount of carbon dioxide captured and the amount of Product B produced and to prepare an LCA consistent with the standards of ISO 14044:2006. The LCA compares the amounts of carbon dioxide captured by Taxpayer in Process A and utilized by Process B to a baseline in which the carbon dioxide produced as a by-product of Process A is assumed to have been emitted and Taxpayer is assumed to have obtained the carbon dioxide it needed from a non-captured source.

The LCA therefore compares, for every unit of Product B produced:

Baseline: 1MT of carbon dioxide from a fossil, non-captured, source

Tested current process (carbon capture and utilization): 1MT of carbon dioxide captured and utilized

Net amount of carbon dioxide displaced from being emitted into the atmosphere per unit of Product B: 1MT

Units of Product B produced in Year 1: 200,000

Amount of Credit: Taxpayer's section 45Q credit for Year 1 is equal to the amount determined under section 45Q(a)(2) for Year 1 for the per unit MTs of carbon oxide displaced from being emitted times the number of units produced. 1MT per unit x 200,000 units = 200,000MT of captured and utilized qualified carbon oxide.

Example 2:

Facts: The facts are the same as Example 1 except that in Process B, 10% of the captured carbon dioxide is used to run the facility which makes Product B and 90%

of the captured carbon dioxide is chemically converted and securely stored in Product B. Therefore, for every unit of Product B produced, 0.9MT of captured carbon is incorporated into Product B and 0.1MT is used to run the facility. In addition, in the course of performing Process B, the facility emits a greenhouse gas as a by-product of production of Product B. For every unit of Product B produced, 1 ton of methane, with a carbon equivalency of 25, is emitted. The amount of methane emitted does not vary with the source of the carbon oxide used in Process B. In Year 1, Taxpayer produces 200,000 tons of Product B.

The LCA therefore compares, for every unit of Product B produced:

Baseline for production of Product B: 1MT of carbon dioxide from a fossil, non-captured, source and 1MT of methane emitted = 26MT carbon or carbon equivalent emitted

Tested/current process (carbon capture and utilization): 1MT of carbon dioxide captured, 0.9MT of carbon dioxide utilized, .1MT of carbon dioxide emitted, 1MT of methane emitted = 25.1MT emitted

Net amount of carbon dioxide displaced from being emitted into the atmosphere per unit of Product B: 0.9MT

Units of Product B produced in Year 1: 200,000

Amount of Credit: Taxpayer's section 45Q credit for Year 1 is equal to the amount determined under section 45Q(a)(2) for Year 1 for the per unit MTs of carbon oxide displaced from being emitted times the number of units produced. 0.9MT per unit x 200,000 units= 180,000MT of captured and utilized qualified carbon oxide.

F. Baselines and Boundaries for LCAs in Connection with Use in a Commercial Market

You requested comments about baselines and boundaries to ensure consistency in application among taxpayers. In this regard, we also address issues that may be presented by the need to prepare an LCA for commercial markets utilization rather than a chemical conversion utilization in order to ensure equivalency of procedure as between those two different methods of claiming the credit. Those comments are presented further below in connection with the discussion of commercial markets utilization.

II. Section 45Q(f)(5)(A)(iii): Commercial Markets

Section 45Q(a)(2) and (a)(4) provide for a credit for capture of qualified carbon oxide which is utilized by the taxpayer in a manner described in subsection (f)(5). Section

45Q(f)(5) provides that utilization of qualified carbon oxide means: (i) fixation of the captured carbon oxide through photosynthesis or chemosynthesis; (ii) chemical conversion of such qualified carbon oxide to a material or chemical compound in which the 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 in EOR), *as determined by the Secretary of the Treasury*.

The proposed regulations did not address the third category of utilization ("commercial markets") but in the NPRM Preamble there is a request for comments on the topic.[8]

A. Determination of Existence of Commercial Markets

1. Determination Limited to Existence, Not Purpose or Use

We note first that, in developing rules in this area, the Secretary's discretion does not appear to be unlimited. The statute includes in the sanctioned forms of utilization: "the use of such qualified carbon oxide for any purpose for which a commercial market exists . . . as determined by the Secretary." Because the statute is explicit that *any* purpose using qualified carbon oxide is creditable, the determination of the Secretary seems to be limited to whether a commercial market exists for that purpose. The statute does not charge the Secretary with determining whether a purpose for which the carbon oxide is used is a utilization that is eligible for the credit, since any purpose is permissible, and the statute gives no indication that the Secretary is to impose requirements regarding the nature of the utilization.

Accordingly, we suggest that the correct statutory interpretation is that the use of the qualified carbon oxide for *any* purpose is a utilization that is eligible for the credit if there is a commercial market for that purpose. Therefore, to best encourage the activity section 45Q was designed to incentivize, we believe Treasury and the IRS should develop guidance in which they acknowledge the existence of specific commercial markets for captured carbon oxide or, at a minimum, describe the manner in which they expect to make the determination of the existence of such commercial markets, perhaps by defining the meaning of the term "commercial market" for this purpose.

2. Precedent

The IRS has not previously had to determine the existence of, or define, a "commercial market" since the term is found nowhere else in the Internal Revenue Code other than section 45Q. In our research, the most similar provision we could find is that of section 48B(d)(3)(C), which relates to the selection criteria for awarding competitive certification to qualified investment in qualifying coal gasification projects. In that context, the recipient of the certification must document to the satisfaction of the Secretary that a market exists for the products of the proposed project as evidenced by contracts or written statements of intent from potential customers. The provision is designed to support the recipient's assertion that a market will exist

[8] NPRM, p.30.

in the future, however, and not to document the current existence of a market. A similar requirement could be developed for section 45Q commercial markets, such as a requirement that the claimant submit documentation of sales contracts evidencing its market, but, because the bulk of the current commercial markets are objectively observable, a documentation requirement for each claimant would seem to be an additional unnecessary paperwork burden.

In two other contexts, the presence of a market will affect the tax treatment of equity[9] and debt[10] interests, respectively, however, in both cases special definitions of "market" are provided that would not seem to be applicable to the question of section 45Q commercial markets.

Without precedent for interpretation, principles of statutory construction would apply the plain meaning of the words.[11] The phrase "commercial market" is ordinarily taken as a reference to any market for goods or services that are purchased or available for purchase by the public or nongovernmental entities.[12] Apart from the qualification that trades in the market not be with governmental or nonpublic entities, characterization as a commercial market does not appear to depend upon any particular threshold size or volume of transactions.

3. Criteria for Determining Existence of Commercial Market

If the IRS would like to develop rules for the determination of existence of commercial markets for the use of captured carbon oxide, one question would be whether there could be taxpayer abuses that such rules should restrict. In that regard, if the determination of the existence of a commercial market is dependent upon a certain minimum volume or number of transactions, taxpayers could attempt to meet the minimums by creating transactions with related parties for artificial prices. In order to prevent reliance on such transactions, the rules should provide that the determination of existence of a commercial market cannot be supported by transactions between related parties. Beyond that, however, it would appear that a commercial market should be found to exist when there are sales for such purpose in any amount, volume or number as long as there are sales between nongovernmental, unrelated parties.

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[9] For purposes of determining whether a partnership is a publicly traded partnership, partnership interests are readily tradeable on a "secondary market" if "taking into account all of the facts and circumstances, the partners are readily able to buy, sell, or exchange their partnership interests in a manner that is comparable, economically, to trading on an established securities market." Treas. Reg. section 1.7704-1(c).

[10] "A debt market exists with respect to a debt instrument if price quotations for the instrument are readily available from brokers, dealers, or traders." Treas. Reg. section 1.1092(d)-1(b)(2)(ii).

[11] *Robinson v. Shell Oil Co.*, 519 U.S., 336, 340 (1997) ("[The] first step in interpreting a statute is to determine whether the language at issue has a plain and unambiguous meaning with regard to the particular dispute in the case."); *Wichita Ctr. for Grad Medical Ed., Inc. v. U.S.*, 917 F.3d 1221 (10th Cir. 2019).

[12] The Computer Language Company Inc., definition of "commercial market," available at https://encyclopedia2.thefreedictionary.com/commercial+market (defining "commercial market" as "the sale of products and services to end users and public and private companies, but not to governmental agencies").

Section 45Q does not require that a market have a minimum volume or frequency of transactions in order to be considered to be a commercial market for purposes of section 45Q(f)(5). Accordingly, the Secretary could in theory apply whatever standards the Secretary thinks appropriate to determination of existence of a commercial market. Such standards should, however, be objective, measurable and knowable. For example, if the Secretary wishes to require that in order to qualify as a commercial market, a certain number of transactions must have occurred, consideration should be given to how taxpayers will be able to determine whether that test has been satisfied since much business transaction information will remain confidential to the parties involved.

It might be possible for transaction volume requirements to be based on information that is publicly available. We presume that, through either the Commerce Department, the Energy Information Agency, the Congressional Research Service, the Office of Management and Budget (OMB) that administers the industrial census or other administrative agencies, the Service has access to information regarding sales of carbon oxide into various markets and the volumes of such gas that is sold.[13]

If commercial markets are defined in terms of the use that is made of the captured carbon, however, reliable information to support the determination may be more difficult to obtain. If the captured carbon oxide is sold to an industrial gas distributor who, in turn, sells the gas to an end user, it may be more difficult to determine the exact use to which the gas is put. One might assume that a sale to a beverage manufacturer is being used to produce beverages and that a sale to a hospital system is being used to perform surgery but determination of exact amounts for specific uses may be difficult.

4. Guidance Process for Commercial Market Determination

Due to difficulties in obtaining information that would allow taxpayers to determine whether a market meets any particular definition for "commercial markets," it would be extremely helpful if the final regulations (or re-proposed regulations) include specific acknowledgement of those commercial markets for carbon oxide that the Secretary has determined exist.

A statement in the regulations that recognizes the existence of such markets would mean that taxpayers would not have to ask for individual guidance as to the treatment of each of the markets into which they sell. To the extent that regulations specifically provide that commercial markets are deemed to exist (for example, for food and beverage manufacturing),

[13] North American Industry Classification System (NAICS) Code 325120 covers "Industrial Gas Manufacturing," which includes establishments primarily engaged in manufacturing industrial organic and inorganic gases in compressed, liquid and solid forms. Data reported under this NAICS code is used by federal statistical agencies to collect, analyze and publish statistical data regarding these industries and could also elicit significant information about the markets, although such data may not isolate statistics related to carbon oxide as opposed to other industrial gases.

taxpayers would be relieved of the need to obtain private guidance or letter rulings on each possible market.

Because the statute gives no indication as to the basis upon which the Secretary is to determine existence of markets, a practice of issuing private letter rulings with respect to sales into particular markets based on discretionary authority of the Secretary would not provide the certainty of outcome taxpayers need and could cause government resources to be burdened with a large number of requests for private letter rulings on similar or identical facts.

Alternatively, the IRS could issue guidance in the form of periodic notices in which it recognizes the existence of certain commercial markets for carbon oxide. Whatever practice is adopted with respect to the determination of the existence of commercial markets, given the constant research and scientific advancements that are being made in uses for carbon oxide, such practice should accommodate such new uses and allow them to be quickly recognized for purposes of this provision.

5. Examples of Commercial Markets

From our understanding of the commercial markets into which carbon oxide is sold today, we believe that a list of active markets for the sale of carbon dioxide would include, at a minimum, the following:

- Food and Beverage
    - Beverage carbonation (soda, beer)
    - Food preparation (cooling through use of CO2 "snowing")
    - Flour and dough cooling
    - Freezing and chilling, refrigeration, dry ice
    - Greenhouse growing (injection of CO2 to promote photosynthesis)
    - Meat processing, packing and mixing (e.g., injection of liquid CO2 to promote uniform cooling, use of carbon monoxide for slaughtering)
- Health and Medical
    - In laparoscopic surgery, for insufflation
    - As a respiratory stimulant

- Liquid CO2 for cryosurgery

- Pulp and Paper (used to enhance pulp yield)
- Water and Wastewater Treatment (as a solvent, to reduce pH)
- Welding and Metal Fabrication
- Agricultural and Fertilizer (greenhouse flooding with carbon dioxide, carbon dioxide as an ingredient in many fertilizers, including urea)
- Diesel Exhaust Fluid (carbon dioxide an ingredient in DEF)
- Fire Extinguishers[14]

All of these uses are significant, legitimate and longstanding commercial uses for carbon oxide which, if not supplied through captured carbon, would have to be supplied some other way, such as through the production of carbon dioxide out of non-captured, fossil or natural carbon dioxide-bearing formations.[15] When carbon oxide is displaced from being emitted into the atmosphere in order to sell it into such markets, the utilization requirements of section 45Q(f)(5)(A)(iii) should be considered to have been satisfied.

B. Commercial Market Uses Need Not Involve Secure Storage or Permanent Isolation from the Atmosphere

Section 45Q(f)(5)(A)(ii) addresses utilization of captured carbon oxide by means of chemical conversion into a material or chemical compound in which the carbon is securely stored. In contrast, section 45Q(f)(5)(A)(iii) contains no mention of a secure storage requirement. Therefore, for clause (A)(iii) to have a meaning separate from that of clause (A)(ii), it must address something different than clause (A)(ii). While the former provision requires that the chemical conversion place the carbon oxide in a material or chemical compound in which the carbon is securely stored, the latter provision contains no reference to secure storage as being a required element of the purpose for which there is a commercial market. Accordingly, clause (A)(iii) would

[14] An interesting and extensive list of current applications for carbon dioxide is found at https://en.wikipedia.org/wiki/Carbon_dioxide#Applications. See also https://www.online-sciences.com/earth-and-motion/the-importance-and-uses-of-carbon-dioxide-gas/.

[15] As a striking, current example of the significance of these markets, we refer you to recent news items regarding the distress of food and beverage manufacturers over the CO2 shortage resulting from pandemic-related cutback in ethanol production. See, e.g., https://www.reuters.com/article/us-health-coronavirus-ethanol-beer/beer-may-lose-its-fizz-as-co2-supplies-go-flat-during-pandemic-idUSKBN2200G3 (April 18, 2020); https://www.forbes.com/sites/lanabandoim/2020/04/28/surprising-shortage-of-carbon-dioxide-threatens-food-and-beverage-industries/#3a0e119e1ea3 (April 28, 2020); https://www.desmoinesregister.com/story/news/2020/04/24/iowa-ethanol-plant-restarted-production-help-des-moines-water-works-co-2-levels-covid-19/3014751001/ (April 24, 2020).

seem to cover uses in which captured carbon oxide is not being stored by chemical conversion into another substance.

This interpretation is consistent with the statute's exclusion of use as a tertiary injectant from the commercial markets provision of clause (A)(iii): since carbon oxide that is sold for use as a tertiary injectant is not chemically converted into a material in which it is securely stored and is in general a sale of the gas as such, it would have been encompassed by clause (A)(iii) unless this explicit exclusion were placed in the provision.

The uses covered by clause (A)(iii) that would be different from clause (A)(ii) would therefore seem to be: (i) sales of captured carbon oxide *as such*, i.e., sales in which the carbon oxide has not been converted into another substance, for example, sales in which the gas itself is going to be used to perform a function, such as cooling, or (ii) sales of captured carbon oxide that has been converted into another substance but in which the carbon oxide is not securely stored, for example, sales of a substance that when used or applied, releases carbon oxide, such as dry ice, carbonated beverages or diesel exhaust fluid.

Section 45Q(f)(5)(B) provides that the credit amount is equal to the amount of qualified carbon oxide the taxpayer demonstrates (based on the LCA) was captured and either permanently isolated from the atmosphere or displaced from being emitted into the atmosphere. The uses described above that would be covered by clause (A)(iii) generally do not result in permanent isolation of the captured carbon oxide from the atmosphere. Nevertheless, being "displaced from being emitted into the atmosphere" is a separate, stand-alone basis for determining the amount utilized and one that does not require being permanently isolated from the atmosphere.[16]

Therefore, even though there is not permanent isolation from the atmosphere, the use for any purpose for which there is a commercial market covered by section 45Q(f)(5)(A)(iii) can qualify for the credit by displacing carbon oxide from being emitted into the atmosphere. Accordingly, the commercial market uses under section 45Q(f)(5)(A)(iii) should not be limited to ones in which there is permanent isolation from the atmosphere. We urge the IRS and Treasury to use its regulatory authority in this area to make clear that the use for any purpose for which there is a commercial market can qualify for the credit even though there is not permanent isolation of the carbon oxide from the atmosphere if there is displacement from emission into the atmosphere.

C. The LCA for Commercial Market Uses – Baselines and Boundaries

Under section 45Q(f)(5)(B), an LCA is to be used to measure the qualified carbon oxide utilized in any of the three processes described in section 45Q(f)(5)(A), including utilization

[16] It is an established principle of statutory construction that effect should be given, if possible, to every clause and word of a statute so as to avoid rendering superfluous any provision (i.e., no provision is "mere surplusage"). See, e.g., *Bailey v. United States*, 516 U.S. 137, 146 (1995) ("We assume that Congress used two terms because it intended each term to have a particular, nonsuperfluous meaning.")

for any purpose for which a commercial market is determined to exist. Since clause (A)(iii), for the reasons discussed above, appears to be aimed at utilization of the gas to perform a function or other uses which do not involve permanent storage, the LCA required for commercial market use would necessarily focus on the amount referenced in section 45Q(f)(5)(B)(i)(II), that is, the amount being displaced from being emitted into the atmosphere, rather than the amount that is being permanently isolated from the atmosphere.

1. Displacement of Emission

Section 45Q(f)(5)(B)(i)(II) requires that, for purposes of determining the amount of qualified carbon oxide utilized by the taxpayer, the amount is equal to the tons which the taxpayer demonstrates, based upon an LCA, were displaced from being emitted into the atmosphere through use of the process described in clause (A)(iii).

Depending on the boundaries for the LCA, however, if the carbon oxide is released back into the atmosphere when it performs its function or it is used, then an LCA that used as boundaries the cradle (the feedstock creation, i.e., the capture of the carbon oxide) and the grave (the consumer's use), would determine that no amount had been displaced from being emitted into the atmosphere. Such a conclusion would appear to be flawed, however, because, if the carbon oxide is necessary to the commercial market, if not obtained from the capture source, the market would obtain it from a non-captured, fossil source, such as production wells, that would be introducing additional carbon oxide into the atmosphere. If captured carbon oxide had not been available to the end user, it would have obtained the carbon oxide it needed from another source. That source would have necessarily involved the introduction of carbon oxide from a non-captured or fossil source, such as natural underground deposits. In other words, the credit should be available for capturing carbon and selling it to a party, even if such party's use does not permanently isolate the carbon oxide from the atmosphere, because, had that party not been able to obtain the carbon oxide from the capturer, it would have obtained it by introducing additional carbon dioxide into the atmosphere from non-captured, natural fossil sources. Therefore, by using the captured carbon oxide, the commercial market has displaced carbon oxide from being emitted and an LCA that looks only at the use of captured carbon that is emitted upon use ignores the emission savings.

2. LCA Ending Boundary and LCA Baseline for Commercial Market Uses

We have two suggestions as to how an LCA could be performed for commercial market uses that would prevent distortions that could arise from the release upon consumer use and that would address the requirement that carbon oxide be displaced from being emitted into the atmosphere.

First, the LCA ending boundary could be set at the facility gate. If a cradle-to-gate rather than a cradle-to-grave analysis is used for the LCA, the analysis would not examine the use

of the product and would not include the release of carbon oxide upon use of the product in the evaluation of the net GHG effect. Excluding the consumer use phase from the LCA has previously been recommended when the consumer's use of the product and its GHG footprint does not vary or change depending upon whether the product is made using captured carbon oxide or carbon oxide that is from a non-captured source.[17] If the GHG footprint of the consumer use is the same regardless of the source of the carbon oxide in the product, then including the consumer use phase in an LCA that compares captured carbon oxide to another source will not result in a net difference, making the inclusion of that phase unnecessary. Setting the LCA boundary at the gate also resolves all of the practical problems associated with obtaining the information necessary to perform an LCA when it is not clear to the seller into the commercial market what the buyer will use the carbon oxide for or how long the carbon oxide will reside in the product before it is released upon use, which may vary from product to product.

Second, as discussed above with respect to the LCA baseline in the case in which carbon oxide is chemically converted into a material or substance in which it is securely stored, the baseline for the LCA in the case of commercial markets use could be a baseline in which the carbon oxide that is captured is instead treated as having been released with the commercial market needs being satisfied through a non-captured source, such as release from a natural fossil deposit. If such baseline assumptions were used, the LCA would compare:

X (the base case):

> the production of carbon oxide as a product or by-product of industrial operations, its release into the atmosphere, the production of additional carbon oxide from natural deposits, its sale into a commercial market, followed by (potentially), its subsequent release upon consumer use in that commercial market;
>
> to

Y (the tested case):

> the production of carbon oxide as a product or by-product of industrial operations, followed by its capture for sale into a commercial market, followed by (potentially) its subsequent release upon consumer use in that commercial market.

In this manner, the LCA would demonstrate that the use of captured carbon oxide in the tested case Y displaces from being emitted into the atmosphere the carbon oxide that is produced to satisfy the commercial market in the base case X.

[17] See Guideline, *supra* n.7, at 6.

3. Example of Suggested Baseline Approach for Commercial Markets Use

To illustrate application of the suggested baseline, perhaps an example could be included in the regulations along the following lines, recognizing that the LCA process itself would entail more extensive additional considerations:

Example 1 (Commercial Markets Use LCA Baseline):

Facts: Taxpayer produces Product A using Process A. Carbon dioxide is a by-product of Process A. Taxpayer captures the carbon dioxide by-product and sells it to Y. Y is an industrial gas distributor who sells the captured oxide to a variety of customers for functions ranging from use in food and beverage operations, dry ice manufacture and fertilizer manufacture. Taxpayer arranges for a qualified independent third party to verify its measurements of the amount of carbon dioxide captured, the amount it sells to Y and the amount Y sells to its customers. In Year 1, Taxpayer captures 300,000MT of carbon dioxide and sells it to Y. Y sells 300,000MT of carbon dioxide to its customers. The qualified independent third party also prepares an LCA. The LCA compares the amounts of carbon dioxide captured by Taxpayer in Process A to a baseline in which it is assumed that (i) Taxpayer emitted the carbon dioxide produced as a by-product of Process A and (ii) Y's customers obtained the amounts of carbon dioxide they purchased from a non-captured, fossil source, such as production from natural deposits.

The LCA therefore determines the amount of carbon oxide that has been displaced from being emitted into the atmosphere by comparing:

Base Case (X): 300,000MT of carbon dioxide produced as a by-product and emitted with no capture, an equal amount (+300,000MT) produced from non-captured, natural underground deposits in order to supply commercial market, followed by release into the atmosphere upon consumer use for a total emitted amount of 600,000MT;

to

Tested Case (Y): 300,000MT of carbon dioxide produced as a by-product and captured, an equal amount sold into commercial market, followed by release into the atmosphere upon consumer use.

Net amount of carbon dioxide displaced from being emitted into the atmosphere (X-Y) = 300,000MT

Amount of Credit: Taxpayer's section 45Q credit for Year 1 is equal to the amount determined under section 45Q(a)(2) for Year 1 per ton of qualified carbon oxide times 300,000.

Summary of Comments

1. Treasury and the IRS should give consideration to providing that the LCA should compare the capture and utilization process to a baseline in which the taxpayer would be assumed to have emitted the carbon oxide and obtained the carbon oxide used in its process from a non-captured source.

2. A commercial market should be found to exist when there are sales of carbon oxide in any amount, volume or number as long as there are sales between unrelated, nongovernmental parties.

3. Due to difficulties in obtaining information that would allow taxpayers to determine whether a market meets any particular definition for "commercial markets," the final regulations (or re-proposed regulations) should include specific recognition of those commercial markets for carbon oxide that the Secretary has determined exist in order to avoid the need for individual taxpayer rulings.

4. The regulations should clarify that commercial market uses under section 45Q(f)(5)(A)(iii) need not involve secure storage or permanent isolation from the atmosphere of captured carbon oxide.

5. The boundary for LCAs that evaluate the greenhouse gas emissions of carbon oxide sold into commercial markets should end at the production facility gate.

6. For LCAs that determine the amount of carbon oxide displaced from being emitted into the atmosphere by reason of sale into a commercial market, the base case (against which the tested process is compared) should treat the captured carbon oxide as released and the commercial market needs satisfied through a non-captured, i.e., fossil, source, such as release from a natural underground deposit.

Thank you for the opportunity to comment on the proposed regulations. If you have any questions regarding these comments or would like to discuss any of the issues addressed, please contact us at the above number.

Respectfully Submitted,

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