August 3, 2020

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Room 5203
Internal Revenue Service
P.O. Box 7604
Ben Franklin Station
Washington, DC 20044

Submitted Electronically to Federal eRulemaking Portal: IRS REG-112339-19

Dear Secretary Mnuchin and Commissioner Rettig:

The undersigned entities, representing a diverse range of nonprofit organizations engaged on environmental and clean energy policy, submit the below comments relating to the proposed regulations on the section 45Q tax credit, and in particular IRS' request for comments on section 4, "Utilization of Carbon Oxide".

Background

The section 45Q updates made by Congress in the Bipartisan Budget Act of 2018 have encouraged the development of more than two dozen large-scale carbon capture projects. They include a combination of power plants, industrial and direct air capture facilities. Most of these recently announced projects are likely to securely store captured carbon dioxide in geologic formations. Today, underground storage is the most likely destination for captured carbon dioxide based on a combination of factors including economics, technology maturity and scale.

The future market for non-geologic carbon utilization, however, is significant. Some studies forecast that carbon utilization, the conversion of carbon dioxide to commodities, has growth potential in the next decade. One report finds that the mitigation potential of carbon utilization in the concrete industry alone is up to 1.4 billion metric tons by 2030.[1] Carbon utilization markets are also more likely to pay a premium for carbon dioxide over enhanced oil recovery and other geologic uses.

As part of the Bipartisan Budget Act's section 45Q updates, Congress created incentives for non-geologic carbon utilization based upon "an analysis of lifecycle greenhouse gas emissions". The statute is ambiguous whether only reductions from

[1] Center for Climate and Energy Solutions (C2ES). *Carbon Utilization – A Vital and Effective Pathway for Decarbonization*. August 2019.

carbon oxides are eligible for the credit, or if a broader set of greenhouse gases could be considered.

As highlighted by the Internal Revenue Service (IRS) and other commenters, there is little federal precedent for quantifying or issuing credits based on lifecycle greenhouse gas emissions.

In order to maintain the fiscal and environmental integrity of the 45Q tax credit, we appreciate the methodical and deliberate steps the agency is taking to develop a carbon utilization crediting framework, as described in its proposed rule on May 28, 2020. Due to the high volumes of pipeline-quality carbon dioxide that may be produced from 45Q-incentivized carbon capture projects, new carbon utilization projects may arise alongside them. The section below offers recommendations on how to incentivize carbon utilization products and processes that generate environmental benefits, while balancing the need to safeguard taxpayer resources.

Recommendations

Lifecycle analyses should determine 45Q credit eligibility.

We support the IRS' proposed rulemaking to compare the lifecycle greenhouse gas emissions of a product or process relative to a baseline level.

A carbon utilization product or process should only be eligible for 45Q tax credits if it is expected to generate emissions reductions relative to a baseline, thus generating a positive environmental benefit. The agency proposes to use a combination of direct measurement and lifecycle analysis to quantify the amount of utilized carbon dioxide. We support this approach to ensure an incentivized carbon utilization product or process does not result in higher overall greenhouse gas emissions (GHG). Hence, a lifecycle analysis must consider the net greenhouse gas emission impacts of a product or process, including carbon dioxide and other greenhouse gases defined by the Clean Air Act. Greenhouse gases should be compared on a consistent global warming potential basis, such as in Table A-1 of 40 CFR Part 98 subpart A.

Credits should only be generated by volumes of utilized or displaced carbon oxide.

As stated in the above section, a lifecycle analysis should be used to determine *whether* a product or process is eligible for 45Q credits. The *amount* of 45Q credits generated by a given product or process should be correlated to the volume of carbon oxides directly utilized from a qualified facility or displaced from being emitted to the atmosphere. We strongly disagree with another commenter's suggestion that displaced non-carbon oxide emissions should also generate 45Q credits. While addressing all greenhouse gas emissions is important from an environmental perspective for achieving net-zero

emissions by mid-century, 45Q is a technology-specific mechanism designed to catalyze innovation and commercialization of mechanical carbon capture technologies at qualified facilities.

Section 45Q(f)(5)(B) makes clear carbon utilization credits can be generated based on displaced carbon oxide emissions and an associated life cycle analysis. Life cycle analyses can provide a comprehensive overview but have inherent limitations. They are often forced to make assumptions around upstream inputs, product durability, and end-of-life considerations – as well as the baseline product they are displacing.

Crediting non-carbon oxide pollutants has the potential to have a multiplier effect on these uncertainties, and could have unintended market and environmental impacts. Some greenhouse gas emissions have global warming potentials tens to tens of thousands times carbon dioxide. For example, methane and sulfur-hexafluoride are both Clean Air Act-designated greenhouse gas emissions and have 100-year global warming potentials of 24 and 22,800, respectively.[2] If credited at the $35 per ton carbon oxide utilization rate, a single ton of methane displaced would receive $875 in 45Q credits, and sulfur-hexafluoride nearly $800,000.

Although the underlying calculations and assumptions supporting lifecycle analyses are continually refined, the uncertainties associated with the limitations of lifecycle analysis make crediting non-carbon oxides prohibitively significant. It would also be inconsistent with the crediting mechanisms for geologic storage that maintain a narrower focus on carbon oxides.

Credits should be the lesser of utilized and displaced emissions.

We recommend products and processes generate 45Q credits based on the lesser of directly utilized emissions and the amount of carbon oxide determined to be displaced by a life cycle analysis.

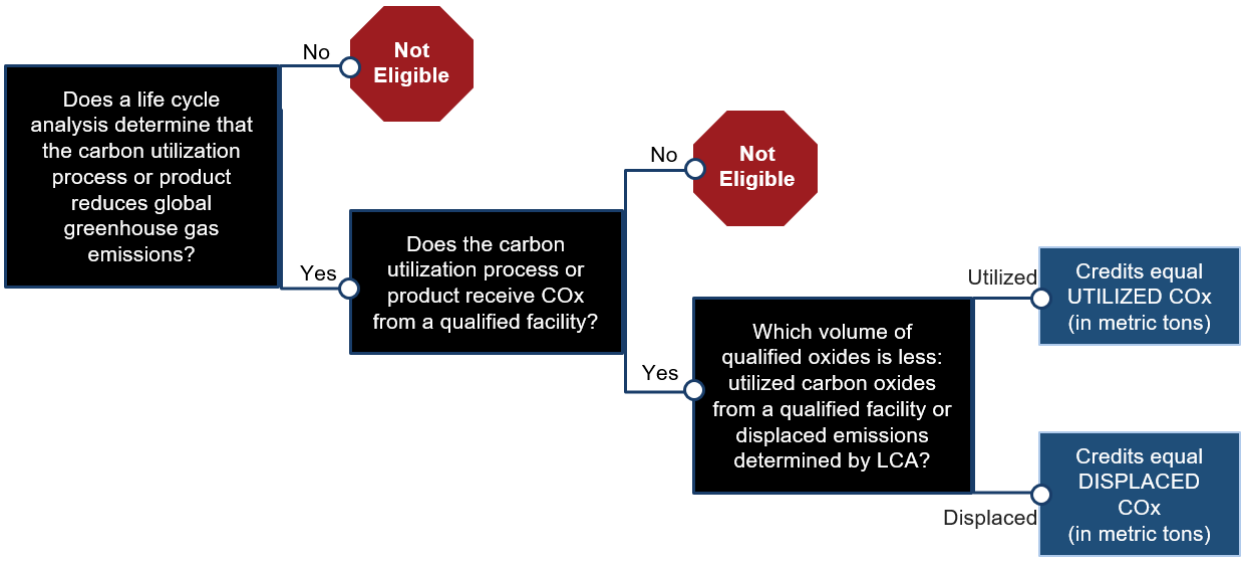
Our proposal would set a cap on the number of credits that can be claimed by a product or process, equal to the volume of utilized carbon oxides that originated from mechanical carbon capture equipment at a qualified facility. Those credits would then be compared to displaced emissions calculated by the lifecycle analysis. This approach would be consistent with the 45Q accounting methods for the secure geologic storage of carbon dioxide. In geologic storage, the maximum amount is how much carbon dioxide is received from a qualified facility. The net amount of credits that be claimed is this maximum less any operational losses, e.g. from pumps and valves.

[2] Table A-1 of 40 CFR Part 98 subpart A.
Note: The Intergovernmental Panel on Climate Change's Fifth Assessment Report finds that the global warming potentials for methane and sulfur hexafluoride are 28 and 23,500, respectively.

Lifecycle emissions should be based on the full product lifecycle.

We support the IRS proposed rule that calculates lifecycle emissions based on the aggregate quantity of greenhouse gas emissions related to the full product lifecycle relative to a baseline, for certain products and processes. A more holistic perspective is needed to account for key factors such as product longevity and durability relative to the status quo. Although a full product lifecycle approach can increase the number of considerations, relative to a more limited analysis with narrower boundary conditions, a more comprehensive analysis is appropriate in many circumstances.

Simplified decision tree:



Example:

A cement manufacturing facility emits 100,000 metric tons of carbon dioxide in a taxable year. Equipment located at the facility captures 50,000 metric tons of carbon dioxide for a utilization process that turns the captured carbon dioxide into a synthetic fuel. A lifecycle analysis determined that the synthetic fuel produced with the captured carbon dioxide will displace greenhouse gas emissions relative to the baseline case (the lifecycle emissions of a conventional fuel) equal to 75,000 metric tons of CO2-e. The lifecycle analysis found that, of the 75,000 metric tons CO2-e displaced, 35,000 metric tons are from displaced methane and 40,000 metric tons are from displaced carbon oxides. In this example, utilized carbon oxide emissions are 50,000 metric tons and displaced carbon oxide emissions are 40,000 metric tons. Since 45Q credits are based on the lower of utilized and displaced carbon oxide emissions, the synthetic fuels process would generate 40,000 metric tons worth of credits.

Sincerely,

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