



April 18, 2022

To: Council on Environmental Quality
Subject: Comments on Carbon Capture, Utilization, and Sequestration Guidance, 87 Fed. Reg. 8808 (Feb. 16, 2022) (CEQ-2022-0001)

The Institute for Policy Integrity at New York University School of Law¹ (“Policy Integrity”) respectfully submits the following comments to the Council on Environmental Quality (“CEQ”) on its interim guidance document, “Carbon Capture, Utilization, and Sequestration Guidance.”² Policy Integrity is a non-partisan think tank dedicated to improving the quality of government decision-making through advocacy and scholarship in the fields of administrative law, economics, and public policy.

CEQ’s Interim Guidance appropriately highlights many key priorities to assist federal agencies with the regulation and permitting of Carbon Capture, Utilization, and Sequestration (CCUS) activities. **As CEQ updates the guidance document, it should provide additional targeted recommendations for agencies that can help pave the way for stronger CCUS practices.** As the Interim Guidance notes, public opposition and skepticism is a significant barrier to CCUS development and commercialization that could help mitigate the worst impacts of climate change, necessitating clear guidance from CEQ that agencies can implement to improve their CCUS practices.

In particular, **CEQ should revise its Interim Guidance to advise agencies to develop more transparent monitoring, reporting and verification (MRV) programs.** This will help build public confidence in the effectiveness and safety of CCUS, and enable vast improvements in carbon offset and removal regimes that play crucial roles in some states’ net-zero-greenhouse gas laws and many companies’ climate strategies.

Some public opposition stems from confusion over CCUS, which encompasses many different activities that can have vastly different impacts on the climate and on local communities (for instance, point-source carbon capture at a coal plant might entail major local air pollution, while direct air capture (DAC) with carbon utilization is a distinctly different practice that might have limited environmental impacts). **CEQ should explicitly instruct agencies to direct resources to activities and projects with the greatest expected net benefits, including those that most effectively limit lifecycle climate impacts and local environmental impacts.** **CEQ’s guidance should encourage agencies to clearly differentiate between DAC, point-source capture, and other categories of CCUS in both their prioritization decisions and their public communications.**

¹ This document does not purport to represent the views, if any, of New York University School of Law.

² Carbon Capture, Utilization, and Sequestration Guidance, 87 Fed. Reg. 8808 (Feb. 16, 2022) [hereinafter “Interim Guidance”].

Additionally, **CEQ should encourage agencies to overtly prioritize community participation, environmental justice, and the generation of local net benefits in the creation of the four regional DAC hubs established by the Infrastructure Investment and Jobs Act (IIJA).** Agencies should also meticulously track the local benefits and distributional impacts that these hubs generate.

Finally, **CEQ should advise agencies to address discrepancies in lifecycle analysis burdens for CCUS tax credits offered under Section 45Q of the Internal Revenue Code.** The current methods for administering Section 45Q impose a greater burden on developers of carbon utilization projects than on developers of enhanced oil recovery (EOR) projects, creating skewed incentives that could inhibit deep decarbonization. Agencies can help remedy this issue by assisting project developers with certain types of lifecycle analyses, and CEQ's guidance should advise agencies to provide such assistance.

I. CEQ should encourage agencies to develop more robust approaches for MRV and authentication of CCUS activities, and advise that MRV systems be externally verifiable to the extent possible.

Strong and transparent MRV programs are essential to ensure the environmental benefits of CCUS projects, build public trust, protect taxpayers, and enable meaningful market-based solutions to address greenhouse gas emissions. Monitoring and verification of geologically sequestered carbon dioxide is required as part of the EPA's Underground Injection Control Class VI permitting and Greenhouse Gas Reporting Program. However, some major CCUS projects have previously evaded these requirements.³ Agencies will also likely need to develop new MRV programs for carbon utilization projects and expand monitoring efforts for most categories of CCUS projects, including EOR.

CEQ's Interim Guidance briefly notes the need for increased transparency in MRV efforts, and suggests that "agencies such as DOI, DOE, and . . . NOAA should consider expanding existing efforts, and (when feasible) implementing a national program for monitoring deep geologic carbon sequestration."⁴ As it updates the Interim Guidance, CEQ should expand upon and specify this recommendation, directing agencies to prioritize stringent and transparent MRV programs.

Strong MRV programs can enable more effective and trustworthy carbon offset regimes, which play important roles in several states' net-zero-emission laws, and can serve as the basis for meaningful market-based solutions to address emissions. While direct emission reductions remain the most important strategy for addressing climate change, emission offsets also play a key role in several state climate laws and in most current corporate efforts to reduce climate impacts. Multiple state laws, including New York's Climate Leadership and Community Protection Act, rely on offsets to cancel out emissions from hard-to-abate sectors and thereby

³ Letter from J. Russel George, Inspector Gen. for Tax Admin., Department of the Treasury, to Sen. Robert Menendez (Apr. 15, 2020), <https://www.menendez.senate.gov/download/report-45q-tigta?download=1>.

⁴ Interim Guidance, 87 Fed. Reg. at 8810.

reach net-zero greenhouse gas emissions.⁵ Improved federal MRV programs for CCUS projects could help these state efforts succeed. Ultimately, the rigor of verification for carbon dioxide removal (CDR) and other high-quality offsets could have a major impact on whether individual states—and perhaps the country as a whole—are able to reach their climate targets.

Voluntary carbon offset markets have grown significantly in recent years due to demand from corporations and consumers, and the market for offsets is expected to increase further.⁶ Yet these markets suffer from key limitations, as many offset credits may not be tied to legitimate or permanent emission reductions.⁷

Newer markets for CDR address some of these flaws, but could still benefit greatly from stronger verification. The promise of CDR projects that can permanently remove carbon dioxide from the atmosphere is beginning to draw major market interest. For instance, a coalition of companies including Google, Meta, Shopify, and Stripe recently announced that it will purchase \$925 million in carbon removal over the next eight years from a range of vendors working to develop new CDR projects.⁸ Most current CDR projects and markets rely on their own verification systems, or depend on verification from third-party, for-profit entities.⁹ This approach could lead to gaps or fraud, especially as the number of projects and market entrants grows.

Federal oversight and verification of CDR could alleviate these concerns and increase public confidence in CDR markets. If federal agencies can create a robust and transparent system to authenticate CDR by the ton, offset regimes could rely on federal authentication, dramatically enhancing their credibility.

A. CEQ should further prioritize the development of strong MRV programs that can avoid past failures, such as possible fraud in the claiming of tax credits under Section 45Q of the Internal Revenue Code.

While the Interim Guidance notes that “[a]gencies have already taken actions in the past decade to develop a robust CCUS regulatory framework,” the regulatory framework for MRV has shown problematic gaps in recent years. A 2020 Treasury Department investigation into CCUS tax credits granted under Section 45Q of the Internal Revenue Code found that, from 2010–2019, more than \$890 million in § 45Q tax credits were improperly provided to entities

⁵ See 2019 N.Y. Sess. Laws 106.

⁶ See Frances Schwartzkopff, “Crazy” Carbon Offsets Market Prompts Calls for Regulation, BLOOMBERG (Jan. 6, 2022), <https://www.bloomberg.com/news/articles/2022-01-06/-crazy-carbon-offsets-market-prompts-calls-for-regulation>.

⁷ See Robert Mendelsohn, Robert Litan & John Fleming, *How to Repair the World’s Broken Carbon Offset Markets*, YALE ENVIRONMENT 360 (Nov. 18, 2021), <https://e360.yale.edu/features/how-to-repair-the-worlds-broken-carbon-offset-markets>; Lisa Song & James Temple, *The Climate Solution Actually Adding Millions of Tons of CO2 Into the Atmosphere*, PROPUBLICA (Apr. 29, 2021), <https://www.propublica.org/article/the-climate-solution-actually-adding-millions-of-tons-of-co2-into-the-atmosphere>.

⁸ See Robinson Meyer, *We’ve Never Seen a Carbon-Removal Plan Like This Before*, THE ATLANTIC (Apr. 13, 2022), <https://www.theatlantic.com/science/archive/2022/04/big-tech-investment-carbon-removal/629545/>

⁹ See Verifier Application Requirements for Agricultural Projects, NORI, <https://medium.com/nori-carbon-removal/verifier-application-requirements-for-agricultural-projects-e5758319e2f5>; Verra Standards and Programs, VERRA, <https://verra.org/verra-standards-and-programs/>.

that failed to meet the MRV requirements under EPA’s Greenhouse Gas Reporting Program, Subpart RR.¹⁰ Since these entities did not have approved MRV plans in place, it is unclear whether they completed the carbon sequestration activities for which they claimed tax credits, or if leaks or other problems arose. Such examples threaten to undermine the environmental benefits of CCUS and erode public trust. They also present a direct financial threat to taxpayers and the federal government in the form of lost tax revenue. Recently updated IRS regulations may help deter evasion of MRV programs in future tax credit claims under § 45Q.¹¹ Regardless, CEQ should strongly emphasize the importance of rigorous MRV programs so that agencies take steps to prevent other similar problems in the future.

B. CEQ should underscore the need for MRV programs to be externally verifiable whenever possible.

CEQ should direct agencies to make MRV program data publicly available when possible—including data about project performance, leaks or environmental impacts, inspections, safety precautions, and other information. The Interim Guidance repeatedly notes the importance of building public confidence in the effectiveness and safety of CCUS projects.¹² Making MRV efforts transparent and visible to the public can help build such confidence.

As it updates this guidance, CEQ should also advise agencies to emphasize oversight and verifiability in MRV programs, as this has been a limitation of some existing programs. As one example, EPA’s current Greenhouse Gas Reporting Program relies extensively on reports and data submitted by project operators, often with limited oversight. For instance, operators of Class VI wells used for geological carbon sequestration must submit semi-annual reports about well operation including the amount of carbon dioxide injected.¹³ This information is hosted on EPA’s Geologic Sequestration Data Tool, along with operators’ data about internal testing and monitoring, emergency responses, and other matters. The vast majority of this data is available only to operators and permitting authorities, not to the general public.¹⁴ The public also has limited visibility into the extent of oversight that exists to verify operators’ data. Agencies administering MRV programs should make information about projects and related oversight available to local communities and the public at large to the greatest extent possible.

CEQ’s Interim Guidance appropriately suggests that “EPA could consider enhancing reporting for CCUS and carbon capture and utilization (CCU) in proposed rule revisions to the Greenhouse Gas Reporting Program.”¹⁵ As it updates this guidance, CEQ should expand upon this language to directly recommend changes that enable both regulators and the general public to assess project performance.

¹⁰ Letter from J. Russel George, *supra* note 3.

¹¹ See Credit for Carbon Oxide Sequestration, 86 Fed. Reg. 4728 (Jan. 15, 2021) (to be codified at 26 C.F.R. pt. 1).

¹² *E.g.*, Interim Guidance, 87 Fed. Reg. at 8811 (“Enabling commercialization of CCU and CDR will ultimately require increased transparency to build public confidence in the emissions reductions associated with these projects and their durability.”)

¹³ See 40 C.F.R. § 146.91.

¹⁴ See *Geological Sequestration Data Tool Fact Sheet*, ENVTL. PROT. AGENCY (last updated Nov. 2019), https://www.epa.gov/sites/default/files/2019-12/documents/gsd_t_factsheet_nov2019_508comp.pdf

¹⁵ Interim Guidance, 87 Fed. Reg. at 8810.

C. CEQ should advise the Department of Energy and/or other agencies to proactively analyze and help develop technologies that can monitor and verify carbon storage and utilization efforts, and detect leaks.

Programs to analyze MRV technology gaps and stimulate the development of useful technologies are critical, given the nascency of geological carbon storage and carbon utilization (and the potential for unanticipated problems or fraud). Geological carbon sequestration is a very new practice. As of April 2022, there are only two active and nine pending Class VI wells (which are used for this geological carbon sequestration) in the United States.¹⁶ Very few carbon utilization projects have advanced beyond the pilot stage. Given the dearth of existing projects, agencies have had limited opportunities to thoroughly evaluate MRV practices and identify technological needs. CEQ's guidance can help emphasize this as a priority.

The Department of Energy (DOE) is well suited to lead these efforts, as DOE already engages in similar energy technology development work (including for CCUS) through ARPA-e, the Loan Program Office, and the Carbon Negative Shot, among other examples. CEQ should encourage DOE to prioritize MRV technology in such efforts.

CEQ should advise agencies to analyze MRV technology needs and conduct tests of new technologies at the DAC hubs established in the IIJA. These large-scale, federally funded projects will offer a unique opportunity to analyze operational processes and explore how technology could strengthen MRV programs.

In particular, CEQ should advise agencies to explore the use of externally verifiable sensors as well as blockchain technology. Sensors with remote monitoring capabilities could help authorities track and quantify the volume of carbon dioxide that a project captures, transports, or injects, potentially automating key parts of the MRV process and increasing oversight capabilities. Blockchain technology could potentially be used to record each ton of carbon dioxide stored or utilized in a far more transparent manner. Blockchain is already being used to increase traceability in some carbon offset/removal markets, though current efforts have had mixed success.¹⁷ Incorporating this approach into a strong federal MRV program could be highly beneficial. Agencies could explore applications of such technologies at the DAC hubs and in other contexts.

D. A robust federal MRV program could potentially offset its costs with administrative fees, or possibly even create significant new federal revenue streams.

As it updates its guidance, CEQ should direct agencies to pursue beneficial MRV program improvements even if they entail cost increases, as some of these costs can (when

¹⁶ See *Class VI Wells Permitted by EPA*, ENVTL. PROT. AGENCY, <https://www.epa.gov/uic/class-vi-wells-permitted-epa> (last visited Apr. 12, 2022).

¹⁷ Nori, a Seattle-based company, uses blockchain technology to track carbon sequestered through cropland management and sell related carbon removal credits. See *How the Nori Marketplace Works: Generating NRTs*, NORI, <https://nori.com/generate-nrts>. Another company, Toucan, is creating a blockchain registry of existing carbon offsets, though this effort has highlighted many problems in existing offset markets. See Andrew Kersley, *A Crypto Company Thinks It Can Help Fight Climate Change*, WIRED (Feb. 17, 2022), <https://www.wired.co.uk/article/toucan-crypto-carbon-credits>

legally permissible) be recouped through administrative fees. Given that CCUS projects subject to MRV oversight already generate value for developers in the form of § 45Q tax credits and/or credits in offset markets, an administrative fee model for MRV activities has financial merit. Other agency programs, such as several of EPA’s lead-based paint activities, use an administrative fee model.¹⁸ Agencies might be constrained by statutory limits in some such efforts, though future legislation could potentially codify administrative fees for MRV programs.

As demand for carbon removal/offsets grows, federal agencies overseeing MRV programs could also consider novel options to generate federal revenue. The Interim Guidance highlights the desirability of federal procurement for CDR and CCU. Federal agencies with expertise in MRV programs could potentially procure large numbers of projects and sell removal/utilization credits through a federal market or novel financial instrument.

II. CEQ should advise agencies to focus their resources primarily on CCUS activities and projects with the greatest expected net benefits, such as prioritizing CDR and other tools that can best reduce or offset emissions.

As the Interim Guidance appropriately notes, “There are important differences between point-source carbon capture and carbon dioxide removal from the ambient air.”¹⁹ Per Congressional direction, CEQ categorizes the full range of related technologies under the banner of CCUS. In practice, agencies will need to make resource allocation decisions that prioritize certain technologies and approaches over others, and this should be done by comparing the net benefits that various technologies are expected to generate.

CEQ’s guidance can better indicate which CCUS activities are most deserving of federal resources, or identify methods for selecting these priority areas. In particular, environmental concerns surrounding point-source capture from fossil-fuel-fired power plants and EOR may make these approaches less desirable than CDR, CCU, and CCS from industrial sources without low-carbon substitutes. Forthcoming environmental reviews and existing lifecycle analyses can be helpful in shaping or adapting these prioritization decisions.

A. CEQ should more clearly indicate which CCUS activities constitute federal priorities, or at least identify methods to select these priority areas.

As the Interim Guidance notes, the motivation for pursuing CCUS is to address climate change. Given that different categories of CCUS activities can have very different impacts on greenhouse gas emissions (ranging from potentially negative to positive) as well as very different impacts on local pollution and wellbeing, further clarity is needed on which activities agencies should most actively prioritize. Clarifying these distinctions can help guide agency resource allocation and public communications.

Some activities or projects could have minimal climate benefits while creating or exacerbating local pollution, especially for overburdened communities. Point-source carbon

¹⁸ *E.g.*, 40 C.F.R. § 745.92.

¹⁹ Interim Guidance, 87 Fed. Reg. at 8809.

capture at conventional power plants will almost always be environmentally inferior to zero-carbon generation options, due in part to the energy penalty from capture equipment and the difficulty of capturing 100 percent of emissions.²⁰ As an extensive body of research has clarified and EPA has highlighted, fossil-fuel-fired power plants create enormous local pollution burdens, especially for minority, low-income, and indigenous populations.²¹ If plants use carbon-capture technology but continue to emit local pollutants like sulfur dioxide, nitrogen oxides, and particulate matter, local communities could face continued public health costs.²² Agencies should carefully evaluate the full range of expected environmental and economic costs and benefits of such projects to determine the extent to which they will serve the public interest, and allocate agency resources that support them accordingly. The Interim Guidance section on “Understanding Environmental Impacts” highlights important areas of analysis that can clarify the local and global environmental effects of different CCUS activities. CEQ should more clearly articulate that the findings from this analysis should help dictate agency prioritization decisions.

EOR, which is currently the end use for the vast majority of carbon-capture projects, has highly uncertain effects on emissions. In 2019, EPA estimated that “most of the CO₂ captured from industrial processes (66 percent) and nearly all of the CO₂ produced from natural sources (96 percent)” was used for EOR.²³ The amount of carbon dioxide that remains sequestered after each EOR injection cycle is contested, with some estimates as low as 30-40% and others upwards of 90%.²⁴ Although lifecycle emissions often vary by EOR project characteristics, it is disputed whether EOR projects on a system basis are generally carbon neutral, negative, or positive.²⁵ While EOR projects might help develop infrastructure and technical knowledge that enable future progress on other CCUS activities with greater emission-reduction potential, EOR

²⁰ Yan Wang, Zhen Pan et al., *Life Cycle Assessment of Combustion-Based Electricity Generation Technologies Integrated with Carbon Capture and Storage: A Review*, 207 ENV'T RES. 112,219 (2022).

²¹ *Power Plants and Neighboring Communities*, ENV'T PROT. AGENCY (last updated Feb. 15, 2022), <https://www.epa.gov/airmarkets/power-plants-and-neighboring-communities>.

²² *Carbon Capture and Storage Could Also Impact Air Pollution*, EUROPEAN ENV'T AGENCY (2011), <https://www.eea.europa.eu/highlights/carbon-capture-and-storage-could>.

²³ *Greenhouse Gas Reporting Program (GHGRP)*, ENVTL. PROT. AGENCY, <https://www.epa.gov/ghgreporting/capture-supply-and-underground-injection-carbon-dioxide> (last updated Oct. 6, 2021).

²⁴ Compare ANGELA C. JONES, CONG. RES. SERV., CO₂ UNDERGROUND INJECTION REGULATIONS: SELECTED DIFFERENCES FOR ENHANCED OIL RECOVERY AND GEOLOGICAL SEQUESTRATION 1 (2020), <https://crsreports.congress.gov/product/pdf/IF/IF11578> (“According to a 2019 National Energy Technology Laboratory report, between 30% and 40% of the CO₂ is generally considered to be stored after each injection cycle, depending on the reservoir characteristics.”) with Vanessa Núñez-López & Emily Moskal, *Potential of CO₂-EOR for Near-Term Decarbonization*, 1 FRONTIERS IN CLIMATE 1, 4 (2019) (citing Stephen L. Melzer, *Carbon Dioxide Enhanced Oil Recovery (CO₂ EOR): Factors Involved in Adding Carbon Capture, Utilization and Storage (CCUS) to Enhanced Oil Recovery* (2012)) (“A large fraction of the CO₂ injected becomes trapped within the formation and cannot be produced back to the surface along with the produced reservoir fluids. In fact, the current operational experience is that 90–95% of the purchased CO₂ remains geologically trapped.”)

²⁵ See Ryan Gurule, *Captured: Regulating to 1.5C Through Tax, Section 45Q and Escaping from Regressive Pitfalls*, 75 TAX LAWYER (2022) (citing Paulina Jaramillo et al., *Life Cycle Inventory of CO₂ in an Enhanced Oil Recovery System*, 43 ENV'T SCI. TECH. 8,027, 8,031 (2009) (“This study shows, that including all life cycle stages results in significant net emissions. It is important to realize the atmosphere sees these significant GHG emissions and only a small amount of sequestration.”); Núñez-López & Moskal, *supra* note 24, at 5 (“Results of the gate-to-grave CCUS system, in a CO₂-EOR scheme analogous to IEA’s Conventional EOR+ model, indicate that all four CO₂ injection scenarios start operating with a negative carbon footprint and, after years of operation transition into operating with a positive carbon footprint.”)).

may provide limited (or even negative) climate benefits on its own on a lifecycle basis. Furthermore, the § 45Q tax credit already provides major financial incentives for EOR projects. Other less-well-developed approaches with more significant environmental benefits may be more worthy of agency resources.

CEQ's guidance should clearly indicate that agencies should differentiate between CCUS approaches in both their explicit support and their public communications. If some CCUS efforts prove to have problematic impacts on public health, total emissions, equity, or local community wellbeing, agencies should avoid supporting or permitting them, and work to distinguish such projects from CCUS efforts that are net beneficial for the public.

B. To help inform evaluations of different CCUS approaches, CEQ should specify that environmental reviews of CCUS activities should include detailed analysis of lifecycle climate effects, including the scope of potential net carbon removal.

Few past environmental reviews conducted under the National Environmental Policy Act (NEPA) have included detailed information on projects' potential to reduce sectoral emissions or sequester carbon. CEQ's Interim Guidance suggests that agencies could conduct programmatic environmental reviews for categories of potential CCUS projects.²⁶ CEQ should suggest that these reviews, as well as any future project-level reviews, attempt to analyze lifecycle climate effects from a cradle-to-grave perspective, including indirect sectoral effects. By calling for this analysis, CEQ can ensure that agencies provide important information to help evaluate projects (or categories of projects) while also helping develop appropriate methodologies for analyzing emission-reduction potential.

C. In the near term, and until sufficient project-level analyses are available, CEQ should advise agencies to use existing lifecycle analyses of CCUS activities to guide agency prioritization and allocate resources accordingly.

CEQ's Interim Guidance appropriately recommends that agencies "consider consolidating and publishing a repository for life-cycle analysis (LCA) methodology, results, and information related to CCU and CDR, building on existing collaboration through the Federal LCA Commons."²⁷ This effort should be expanded to include other CCUS activities, to facilitate comparisons and help guide agencies' prioritization decisions. As an initial step in this process, CEQ should request that agencies compile the best existing LCAs on various CCUS technologies and use the findings to shape strategies regarding resource allocation for different approaches and projects.

III. CEQ should advise agencies to prioritize community participation, environmental justice, and the generation of local net benefits in the creation of the IIJA's four regional DAC hubs—including by tracking the local impacts that these projects generate.

²⁶ Interim Guidance, 87 Fed. Reg. at 8809.

²⁷ *Id.* at 8811.

The regional DAC hubs outlined in the IIIJA offer a novel opportunity to create new CDR projects and infrastructure with significant federal funding and support. The public reaction to these projects could play a key role in shaping the broader perception of CCUS.

In designing these hubs, agencies should use methodical planning processes that incorporate extensive community involvement and seek to maximize net benefits (including local economic and environmental benefits). The Interim Guidance offers useful recommendations along these lines in its section on “Public Engagement and Interdisciplinary Research.” CEQ should expand upon this section to highlight the importance of developing and using best practices for community outreach and involvement in planning the DAC hubs, specifically. Federal funding and other government support for the DAC hubs could help reduce initial commercial pressure on these projects, and agencies should take advantage of this opportunity by engaging in a robust planning process.

CEQ should also instruct agencies to closely track the performance, associated benefits, and other impacts of these hubs, making this information easily accessible to the public. This tracking should include careful monitoring of the distributional impacts of the projects, including, to the extent practicable, the benefits and adverse impacts experienced by different communities and socioeconomic groups on a granular level.

IV. CEQ should encourage agencies to help address discrepancies in LCA requirements for the Section 45Q tax credit.

Section 45Q currently imposes a greater burden on developers of CCU projects than developers of EOR projects, creating skewed incentives for project development. Carbon utilization projects (as well as standard geological storage projects) could potentially have more significant climate benefits than EOR projects, given the questions surrounding EOR discussed above. To help ease this burden on developers of CCU projects, CEQ should encourage DOE and/or other relevant agencies to assist developers with required LCAs.

Currently, CCU project developers seeking to obtain tax credits under § 45Q are subject to more onerous requirements than are developers of EOR projects. A taxpayer attempting to obtain a § 45Q credit for utilization of qualified carbon oxide must perform an LCA and substantiate that a commercial market for the utilization method exists. The LCA, which evaluates aggregate greenhouse gas emissions resulting from the utilization method, must be documented in a written report and “demonstrate that the proposed process results in a net reduction of carbon dioxide equivalents when compared to a comparison system.”²⁸ Emissions must incorporate both direct and indirect emissions including the “use of the finished product to the ultimate consumer.”²⁹ The LCA must be performed or reviewed by a qualified independent third-party and conform with ISO 14040 and 10444 standards.³⁰ The written LCA report must be submitted for technical review to the IRS and DOE, and DOE must approve the report before

²⁸ 26 C.F.R. § 1.45Q-4(c)(2).

²⁹ *Id.* § 1.45Q-4(c)(1).

³⁰ *Id.* § 1.45Q-4(c)(3)–(5).

credits can be claimed.³¹ EOR projects are not subject to comparable LCA requirements under § 45Q.³²

Given the benefits of speedier development of CCU projects, agencies should work to ease the LCA burden on developers. DOE already must approve LCAs for CCU projects. CEQ should encourage DOE to provide additional resources to assist with the development of LCAs for CCU projects. These resources can also help developers to use best practices for CCU LCA, in line with recent methodological improvements.³³

Additionally, CEQ should direct agencies to compile and/or conduct new LCAs of EOR as well as meta-analyses of existing EOR LCAs. This will help firmly establish the state of knowledge on EOR's climate impacts. This work may help clarify the proper treatment of EOR in future federal policies, including potential revisions to § 45Q requirements.

Conclusion

CEQ's Interim Guidance highlights a range of important issues, and charts a sensible path that can help develop technologies with the potential to mitigate some of the worst effects of climate change. As it updates this guidance, CEQ should provide additional specificity in key areas to clarify priorities for agencies.

In particular, CEQ should advise agencies to develop more robust approaches for MRV and authentication of CCUS activities so that MRV systems can be externally verifiable to the greatest extent possible. CEQ should also instruct agencies to focus their resources primarily on CCUS activities and projects with the greatest expected net benefits. This may entail prioritizing CDR and related efforts, and potentially deprioritizing point-source capture at conventional power plants as well as EOR.

Additionally, CEQ should encourage agencies to overtly prioritize community participation, environmental justice, and the generation of local benefits in the creation of the IJJA's four regional DAC hubs. In doing so, it should instruct agencies to meticulously track the local benefits and other impacts that these projects generate. Finally, CEQ should encourage agencies to help address discrepancies in LCA requirements for the § 45Q tax credit by offering resources for CCU developers.

Respectfully,

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³¹ *Id.* § 1.45Q-4(c)(6).

³² See Gurule, *supra* note 25, at 35 (“[O]nly Other Commercial Qualifying Activities require a life-cycle analysis demonstrating aggregate net displaced GHG emissions. A similar life-cycle analysis requirement would not constitute an undue burden on any other category of activity, as is evidenced by the very studies that demonstrate reductions in GHG emissions that may be possible through CCUS for oil and gas production or electricity production from fossil fuels.”)

³³ See Arno Zimmermann et al. *Techno-Economic Assessment & Life Cycle Assessment Guidelines for CO2 Utilization*, University of Michigan Library (2020), <https://deepblue.lib.umich.edu/handle/2027.42/162573>.