



Response to public comment: Using carbon management under the Cap-and-Invest Program

Dear Washington Department of Ecology,

RMI (founded as Rocky Mountain Institute) appreciates the opportunity to provide feedback on the integration of carbon management within Washington's Cap-and-Invest Program. As an independent, non-partisan, non-profit organization founded in 1982, RMI has a long-standing commitment to transforming energy systems through market-based solutions. Our work spans electricity, transportation, buildings, and industry. In 2022, we launched the [Carbon Dioxide Removal Initiative](#) to catalyze the development and deployment of carbon dioxide removal (CDR) in partnership with industry, government, and the scientific and academic community. We bring deep expertise in evaluating and supporting CDR approaches and policy frameworks that enable their responsible scale-up.

For Washington to align with its requirement to achieve net-zero emissions in 2050, the state should **support the development, deployment, and scaling of CDR solutions in the state**, in addition to deep decarbonization efforts. Washington has already begun supporting CDR in the state by defining it in the Climate Commitment Act, encouraging the consideration of CDR protocol development in the Cap-and-Invest program, completing a CDR study for the state, and prioritizing the development of and investment in CDR in the Washington Comprehensive Climate Action Plan.

To achieve these goals, RMI advises Ecology to uphold the following principles in the Washington Cap-and-Invest Program and in policy generally. These principles inform the remainder of our response.

- Be inclusive of the portfolio of CDR pathways.
- Define CDR as net-negative, additional, and verified.
- Incentivize CDR portfolios that deliver on several objectives: feasibility, durability, scalability, and social and environmental sustainability.
- Account for durability by upholding science-aligned durability criteria.
- Allow for legal / financial flexibility in achieving durability criteria, including the allowance of [contracted durability mechanisms](#).
- Provide additional policy and commercialization support for emerging CDR pathways.
- Incorporate update cycles to CDR standards and protocols to ensure alignment with the latest science and empirical data on the performance of removal pathways.
- Do not undermine or delay decarbonization efforts.

Feedback Area 1: Carbon management within the Cap-and-Invest Program

- 1) **Which engineered carbon management pathways do you think present the greatest opportunity for Cap-and-Invest Program compliance? For example, point source carbon capture and storage, carbon capture and utilization, and technological carbon dioxide removal. Why?**

A variety of carbon management pathways are likely to be well-suited for Washington. For CDR specifically, pathways span a variety of maturities, feedstocks, costs, and potential scales, and Washington has the opportunity to pursue several of these pathways due to its diversity of natural and built resources, including marine approaches (e.g., direct ocean capture, ocean alkalinity enhancement), biogenic approaches (e.g., biochar/bio-oil, biomass burial), and others (e.g., enhanced rock weathering, direct air capture, in situ mineralization). RMI's [State CDR Atlas](#) compiles data from over 80 metrics, to give users insights into the opportunity states have across 8 CDR categories based on each state's infrastructure, natural resources, and workforce. Although a high-level tool, it rates Washington as having a high opportunity for almost all types of CDR due to its natural resources, feedstocks, and infrastructure.

- 2) **What additional clarity is required for effective deployment of engineered carbon management for Cap-and-Invest Program compliance? What is the most important? What is the most pressing?**

There are open questions around what types of CDR will broadly be integrated, how protocols will be developed and harmonized with the larger CDR ecosystem and market, and how safeguards will be enacted, i.e., to ensure a CDR project does not deter from decarbonization, is high-quality (e.g., net-negative, additional, verified), and achieves the climate impact it claims. Additional clarity on the timeline for CDR integration would also be helpful. This comment period marks an important start to answering these questions, and it will be helpful for Ecology to publish its proposed plans for CDR integration and standards after the close of this public comment.

Project developers today will need confidence that the projects they deploy will remain viable under both future rules under the C&I system and, often, the broader voluntary carbon market. Ecology could provide clarity on which standards and methodologies will be applicable and how these standards were chosen, what requirements projects must meet regarding leakage, permanence/durability, life-cycle emissions accounting, and social and environmental safeguards. Such clarity would enable developers to make more informed investment decisions, reduce the risk of stranded project development costs, facilitate access to financing and offtake agreements, and promote greater alignment between the C&I framework and

emerging best practices across carbon markets.

3) Do you have any specific questions regarding the treatment of different carbon management pathways under the Cap-and-Invest Program?

RMI would appreciate clarity on the distinction that Ecology makes between “nature-based” and “technology-based” CDR. These terms create confusion because there is a wide portfolio of CDR pathways, which vary in their use of engineered systems and natural resources. For example, in which grouping does Ecology include marine CDR pathways (e.g., ocean alkalinity enhancement and direct ocean capture), geochemical pathways (e.g., enhanced rock weathering), or biomass-based pathways (e.g., biomass burial, biochar, bio-oil)? While these categories of CDR may be useful for conceptual understanding, they are not mutually exclusive, which could lead to confusion if they are used as tools to distinguish CDR types in policy or to inform public comment opportunities. RMI advises that Ecology avoids relying on this distinction and considers CDR holistically, as it does in the Climate Commitment Act. We advise that Washington avoid defining broad classes of CDR pathways (e.g., nature-based versus technology-based) in regulation and instead create regulations at the pathway level (e.g., direct air capture, afforestation) and for cross-pathway considerations (e.g., geologic storage, biomass use, electric energy use).

Feedback Area 2: Carbon management in Washington

4) Do engineered carbon management pathways present a feasible decarbonization strategy for companies/facilities in Washington? For example, point source carbon capture and storage, carbon capture and utilization, and technological carbon dioxide removal. Why? Why not?

It is important to differentiate between emissions reduction, point-source emissions capture and storage, and carbon removal solutions. CDR can be an effective solution for compensating for emissions that are cost prohibitive or technologically infeasible to abate.

5) What are the greatest obstacles to implementing engineered carbon management in Washington and how can the state remove those barriers?

One of the greatest barriers facing emerging CDR is the cost differential that exists between emerging pathways and more mature pathways. This cost differential often starves emerging pathways, especially when they are integrated directly into a market mostly comprised of cheaper, more mature pathways, without accompanying price and commercialization support. It is important that commercialization supports (e.g., contracts for difference, portfolio standards) are implemented for emerging CDR

pathways. By minimizing the cost differential in the near-term, policy can create opportunities for emerging pathways to become cost-competitive and contribute to the market in the long-term. It is important that Washington consider implementing policy and commercialization supports specifically for emerging CDR pathways when integrating carbon management into the C&I program and more broadly when developing policy for CDR in the state.

In addition to demand, each CDR pathway faces uncertainties related to cost and scaling, feedstock use and efficiency, MRV, and other questions that can be answered through additional RD&D. RMI's Applied Innovation [Roadmap](#) identifies barriers that each pathway faces and necessary R&D funding to overcome those barriers.

Washington's Comprehensive Climate Action [Plan](#) proposes actions the state should take to support emerging pathways in Strategy F.4 and F.5. RMI appreciates Washington's progress on CDR through its CCAP and supports these proposed measures on CDR.

For both emerging CDR and engineered carbon management broadly, there remains significant uncertainty around permitting, siting, ownership of generated reductions or removals, carbon dioxide transportation infrastructure, and long-term liabilities. Ecology can reduce investment risk by creating clearer regulatory pathways for project development and coordinating across other relevant regulatory agencies.

6) What potential impacts or harms could engineered carbon management have on communities and Tribes in Washington? How can Washington proactively mitigate these?

Local social and environmental impacts depend heavily on the project pathway and safeguards. These impacts may include those on air quality, energy demand, water use, construction impacts (e.g. noise, traffic, land disturbance), and impacts associated with sourcing feedstock. Eligible projects should be developed through early, ongoing, and transparent engagement with affected communities and Tribal Nations. Where a project may affect land tenure, cultural resources, or treaty-protected resources, the use and continued process of obtaining Free, Prior and Informed Consent (FPIC) should be used as a benchmark for community engagement.

In addition, safeguards such as transparent grievance and redress mechanisms and benefits sharing agreements should be considered. Ecology can draw from lessons learned through voluntary carbon market frameworks, which have extensively tested stakeholder consultation, transparency, and social and environmental risk management for various engineered carbon management pathways. Washington

should consider cumulative impacts as the C&I program scales, including effects on clean electricity demand, water resources, infrastructure, and communities that already face environmental burdens. In addition, clear frameworks for long-term stewardship, monitoring, and liability can help ensure that responsibilities remain appropriately assigned and do not create burdens for communities, Tribal Nations, or future generations. Broadly, clear regulatory requirements, transparent monitoring, and defined long-term liability and stewardship responsibilities will help mitigate social and environmental impacts.

Feedback Area 3: Implementation of the CCA Program Rule

Permanent sequestration as defined in WAC 173-407-110

7) Which sequestration and/or mineralization approaches might meet this definition of permanent sequestration? Why?

If the program rule pertains specifically to point source capture from facilities, a stream of CO₂ would need to be durably stored in a geologic reservoir or mineralized. There are several methods that can store CO₂ streams durably. See RMI's Applied Innovation [Roadmap](#) for a deeper understanding of durable geologic storage and mineralization methods that may meet this definition, depending on project specifics.

Models and frameworks for CCA Program Rule implementation

9) How can and should elements such as monitoring and verification procedures and risk mitigation, compensation, financial assurance, and reversal provisions be factored into Ecology's implementation of the CCA program rule?

To ensure the program rule permanence requirement is met, regulations need to clarify liability (e.g., who is responsible to monitor and replace reversals at what times, how can that liability be transferred or ended, etc.) and enact mechanisms to ensure reversals are replaced (e.g., a trust, insurance, credit stacking). If liability is not assigned and reversals are not replaced, it is possible the project will not achieve the climate impact it is claiming to.

10) How might federal Class VI well or other applicable state or federal standards be leveraged?

Ecology should leverage existing federal and state standards to create a harmonized and cohesive interstate regulatory environment for project developers. However, the physics of storage of CO₂ in mafic and ultramafic reservoirs differs from conventional geologic storage (depleted oil and gas reservoir storage and saline aquifer reservoir storage), in ways that may enable differentiated and/or reduced monitoring requirements while still maintaining secure and safe storage. We advise

Ecology to investigate how these regulations could be tailored to the different storage mechanisms and the feasibility of differentiating requirements given existing regulations, e.g., EPA Class VI regulations.

11) What other methodologies or protocols related to geologic sequestration and/or mineralization should Ecology look at?

To meet the state's climate goals and potentially create an export market for CDR for Washington, it is important that the state align its protocol development with other jurisdictions and, to the greatest extent possible while still ensuring human and environmental safety and integrity of climate impact, streamline and speed protocol development, evaluation, and/or adoption.

As mentioned in RCW 70A.65.170 (rules for offsets), Ecology shall “Take into consideration standards, rules, or protocols for offset projects and offset credits established by other states, provinces, and countries with programs comparable to the program established in this chapter.” Ecology should consider protocols being developed in California under SB 905, the Paris Agreement Crediting Mechanism, the European Union Carbon Removals and Carbon Farming Regulation, and other emissions regulations policies that are integrating CDR. It is important to note that these policies are incorporating CDR through offset protocols, rather than through a mechanism like the CCA Program Rule.

In addition to protocols being developed by other governments, Ecology should consider protocols that meet high-quality standards being developed through the voluntary carbon market.

Ecology could achieve alignment by adopting a high-quality overarching standard for CDR projects that is compatible with other standards (e.g., Paris Agreement Crediting Mechanism, EU CRCF, etc.) and then:

- a. Adopting third-party protocols that meet the standard; or
- b. Conducting its own protocol development. In this case, we urge that private sector and other jurisdictions' protocols are considered to avoid market fragmentation and enable Washington stakeholders' participation in international markets.

Regardless, it is important that accepted methodologies are updated regularly to ensure alignment with the best available science and to enable harmonization with protocols in other jurisdictions.

Strategies to mitigate impacts to communities and Tribes

12) As Ecology works to provide clarity on the CCA Program Rule implementation,

what strategies could mitigate potential harms to communities and Tribes?

To maintain public trust, Ecology should ensure that there are strong procedural safeguards before captured carbon dioxide is exempted from program coverage.

First, Ecology should consider requiring early, meaningful and ongoing partnership with affected communities and Tribal Nations before approving sequestration sites, standards, or project eligibility. Consultation – such as FPIC-informed engagements – should occur early enough to shape siting, monitoring, emergency response planning, and long-term stewardship arrangements.

Second, there should be a transparent and project-specific risk assessment and public disclosure for projects seeking exemption, including information on groundwater protection, induce seismicity risk, leakage pathways (e.g. legacy oil and gas wells), transportation routes, and corrective action procedures. This information should be accessible and understandable to local communities and Tribal Nations, with adequate time budgeted for negotiations.

Third, Ecology should require robust monitoring and reporting. Exemption from program coverage should depend on continued compliance, and not a one-time eligibility determination. Therefore, Ecology should clarify how reversals, leakage, monitoring failures or other non-compliance events would be addressed.

Ecology should also consider mechanisms that encourage meaningful community and Tribal participation in project benefits, particularly where projects are expected to operate over long time horizons or affect local resources and infrastructure.

Transparent benefit-sharing arrangements, workforce development opportunities, local hiring commitments, or other community investment mechanisms (and the monitoring of such agreements) may help ensure that project benefits are understood, equitably distributed, and responsive to local priorities.

When developing these safeguards, Ecology should also take into consideration the potential impacts on project developers and the viability of projects.

RMI appreciates the opportunity to comment, and, as plans continue to evolve, we would appreciate future opportunities to continue reviewing and contributing to them. Thank you.

Sincerely,

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