



TO: Bill Sponsors: Senator Hansen, Representative Dickson

Members of the House Energy and Environment Committee:  
Cathy Kipp, Jenny Willford, Ken DeGraaf, Ruby Dickson,  
Gabe Evans, Meg Froelich, Elizabeth Velasco, Stephanie Vigil,  
Mike Weissman, Ty Winter

FROM: The Colorado Renewable Energy Society (CRES)

DATE: March 6, 2023

RE: HB23-1210  
Concerning carbon management, and, in connection therewith, ensuring that carbon management projects are eligible for grants und the industrial and manufacturing operations clean air grant program and providing for the creation of a carbon management roadmap.

Dear Bill Sponsors and Members of the House Energy and Environment Committee:

CRES would like to thank the sponsors of HB23-1210. We are aware of the need for this bill to ensure clarity regarding projects that are eligible for air quality improvement investments as provided in SB22-193. According to the SB22-193 fiscal note, the bill -

“Creates the continuously appropriated Industrial and Manufacturing Operations Clean Air Grant Program Cash Fund and transfers **\$25 million** from the General Fund to the cash fund on June 30, 2022. The CEO is authorized to use a portion of the money in the fund to cover the direct and indirect costs of administering the grant program and for interagency money transfers for technical support provided by the CDPHE and the Department of Natural Resources. The CEO may seek, accept, and expend money from federal sources and from gifts, grants or donations.”

CRES is committed to the same climate protection goals as many in the legislature. It is in this spirit that we offer this letter. We share in your knowledge that time is of the essence. When assessing technologies that are proposed to address the climate crisis, we ask that you commit to carefully avoid taking easy, analytical-light, and agnostic “all of the above” approaches.

Pertinent to HB23-1210, we note that SB22-193 included eight voluntary projects that are eligible for grant money. **These six are clearly needed - we support them.**

- energy efficiency projects
- renewable energy projects
- beneficial electrification projects
- transportation electrification projects, and
- projects producing or utilizing clean hydrogen
- methane capture projects

**Our concern with HB23-1210 is limited** to that portion that pertains **to the guidance the legislation sends to the CEO and the selected contractor, as they prepare a Carbon Management Roadmap**. We suggest that the legislature make amendments as indicated below to provide guidance that the Roadmap's analysis **should not be skewed** to prematurely favor granting **state incentives, resources, and financial support** to:

- carbon capture at industrial facilities
- direct air capture

We seek your agreement that we do not have the time, should not get distracted by, and **should not consider spending Colorado taxpayers' money on carbon capture and direct air capture**. We hold this view because the preponderance of evidence based on decades of experience, and the **underlying physics**, points out that these so-called "climate solutions" are energy and financially wasteful (often to an extreme), despite the injection of politically-rigged massive federal subsidies. These technologies are **de minimis** non-starters, requiring **parasitic power** to operate. And these technologies are being promoted at the very time when the legislature needs to be strategic about crafting policies that advance **real solutions** to address the climate crisis.

NREL's and RMI's picturesque presentation on carbon capture and direct air capture was delivered to your Committee on February 9. We note that the presentations **strategically avoided** providing the Committee with a **reality check concerning the price and scale** of the enterprise.

Respectfully, we hope to fill that gap by reminding you that there are 420ppm of CO<sub>2</sub> in the atmosphere, and that number is growing at 2.5ppm per year. That's the scale.

**Here's the key fact, which was not revealed by NREL and RMI:**  
**1ppm of CO<sub>2</sub> weighs 8 billion tons.** That's also the scale.

Multiply 8 billion tons by a deliberately chosen low-ball, very aspirational price of \$100/ton. That's the price.

**Do the math. Then recognize that to remove 1ppm of CO<sub>2</sub> using carbon capture will cost a minimum of \$800 billion.**

**Ignoring the CO<sub>2</sub> growth rate in the atmosphere, if carbon capture was employed with the intent to reduce atmospheric CO<sub>2</sub> from 420 to 419ppm, that would cost \$800 billion.**

Are you still on board with carbon capture?

Recipients of the largesse from carbon capture and direct air capture money from the Treasury Department's Section 45Q direct pay hand out, and the DOE's financial commitment to "all of the above" approach through the Inflation Reduction Act, carbon capture proponents (in this case, NREL's presentation to the Committee) would hardly want to bring the **reality of price and scale** to the Committee's attention. That would be counterproductive, as it would only serve to risk eroding any enthusiasm for the enterprise.

We provide just two examples, out of many studies, that detail the extent of what were **foreseeable technical and financial problems** with carbon capture and direct air capture, **yet proceeded irrespective of the warnings** - the analyses of the highly-respected Institute for Economic and Financial Analysis<sup>1</sup> and Taxpayers for Common Sense.<sup>2</sup>

Because carbon capture and direct air capture projects are burdened with a host of problems documented over the years, we suggest that these projects **deserve special fiduciary legislative consideration and oversight**, as distinct from the first six eligible projects, which do pencil out.

Specifically, we urge the House Energy and Environment Committee to amend the language to ensure that the CEO and contractor operate under a clear legislative intent that the Roadmap must contain credible, comprehensive cost/benefit analyses of anticipated performance and energy consumption of carbon capture and direct air capture, and must include an analysis of carbon capture's direct tie to pipelines and injection, along with their attendant consequences.

It is apparent that the HB23-1210's original language does not anticipate the need to distinguish questionable carbon capture and direct air capture projects from the other (environmentally responsible) six projects. Absent a change in legislative language, an impression will be created that the State is desirous of inviting carbon capture and direct air capture industries to operate in Colorado. The invitation would be made without adequate **due diligence** of the negative implications for pipeline siting and safety, the efficacy of CO2 injection, and without offering evidence that their operations would result in anything other than **an increase in CO2**.

When amended, the legislation will present a more balanced guidance to the CEO and the contractor that the legislature has not pre-determined that the Roadmap should, as the bill currently states to **“attract,” “encourage,” “support,” “catalyze,” “apply gap funding or other support,” and “foster”** these two questionable enterprises. We suggest that the legislature should not signal to the carbon capture and direct air capture entrepreneurs that they **might expect Colorado taxpayers to provide gap funding to their operations**.

We ask Colorado legislators to exercise their **fiduciary obligations to taxpayers** by acknowledging, at the front end, that there may be **serious, readily anticipated financial risks should carbon capture and direct air capture projects operate in the state**. We recommend legislative guidance to those who will prepare the Roadmap that they should conduct their research in a manner that strikes a balance between whatever perceived “positives” that industry asserts, and an honest accounting of the potential pitfalls of having carbon capture and direct air capture industries operate in Colorado. The projects should be fully analyzed, especially if **they intend to operate using taxpayer dollars**. Colorado taxpayers should not be placed in a position where they may be left to pick up the pieces of failed operations.

Accordingly, we propose the following amendments (**indicated in bold**) to HB23-1210:

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(3) IN CREATING THE ROADMAP, THE QUALIFIED ORGANIZATION SHALL ENSURE THAT THE ROADMAP ~~IDENTIFIES~~ **CONDUCTS**

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<sup>1</sup> <https://ieefa.org/resources/carbon-capture-ccs-ccus-ccu>

<sup>2</sup> <https://www.taxpayer.net/climate/45q-issue-brief-nearly-90-percent-of-carbon-sequestration-tax-credits-based-on-insufficient-reporting-and-fraudulent-claims/>

- (a) **A FULL ANALYSIS OF THE ECONOMIC, ENERGY, HEALTH, SAFETY, AND ENVIRONMENTAL RISKS, COSTS, AND BENEFITS, INCLUDING OPPORTUNITY COSTS, THE POTENTIAL WASTE OF PUBLIC CAPITAL, AND NET WASTE OF ENERGY RESOURCES, BEFORE CARBON CAPTURE AND DIRECT AIR CAPTURE INDUSTRIES' ATTEMPT TO IN COLORADO DRAW ON COLORADO'S NATURAL RESOURCES, INDUSTRY, TALENT, LABOR FORCE, AND DEVELOPMENT CAPABILITIES.**
- (b) **THE FOLLOWING PROJECTS ARE EXEMPT FROM THE FULL ANALYSIS AS DESCRIBED IN (a): ENERGY EFFICIENCY, RENEWABLE ENERGY, BENEFICIAL ELECTRIFICATION, TRANSPORTATION ELECTRIFICATION, PROJECTS PRODUCING OR UTILIZING CLEAN HYDROGEN, AND METHANE CAPTURE PROJECTS.**

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(I) ~~COLORADO STATE POLICIES INCENTIVES, THAT~~

(A) ~~ATTRACT-DISCOURAGE~~ COMPANIES TO DEVELOP OR DEPLOY ~~CARBON CAPTURE AND DIRECT AIR CAPTURE CARBON-MANAGEMENT~~ IN THE STATE;

(B) ~~ENCOURAGE-DISCOURAGE NON-COST-EFFECTIVE~~ DEVELOPMENT OF ~~NEW-CARBON CAPTURE AND DIRECT AIR CAPTURE CARBON-MANAGEMENT~~ TECHNOLOGIES;

(C) ~~SUPPORT PROTECT COLORADO TAXPAYERS BY DICOURAGING~~ THE EXPANSION OF ~~CARBON CAPTURE AND DIRECT AIR CAPTURE CARBON-MANAGEMENT~~ COMPANIES IN THE STATE;

(D) ~~CATALYZE-DISCOURAGE~~ PRIVATE INVESTMENT AND MARKET DEVELOPMENT IN ~~CARBON CAPTURE AND DIRECT AIR CAPTURE CARBON-MANAGEMENT BY APPLYING~~ FOR GAP FUNDING OR OTHER SUPPORT FOR ~~CARBON-MANAGEMENT INVOLVING PRIVATE SECTOR PROVIDERS AND BUYERS;~~

(E) ~~FOSTER-DISCOURAGE~~ ~~CARBON CAPTURE AND DIRECT AIR CAPTURE CARBON-MANAGEMENT~~ PROJECTS IN THE STATE.

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(A) CARBON MANAGEMENT PROJECTS THAT POSE RISKS TO HEALTH, OPPORTUNITY, AND QUALITY OF LIFE IN ~~DISPROPORTIONATELY IMPACTED COMMUNITIES~~ **THROUGHOUT THE STATE** ARE EXCLUDED FROM MANAGEMENT FUNDING.

In summary, **we strongly favor the State's encouragement of the first six** eligible air quality improvement investments as provided in SB22-193 (energy efficiency projects, renewable energy projects, beneficial electrification projects, transportation electrification projects, and projects producing or utilizing clean hydrogen). They proactively and economically make substantial improvements to the environment.

In contrast, we have **serious reservations about the economic, safety, and environmental viability of carbon capture and direct air capture projects**. They should be analyzed by the Roadmap in a separate manner from the first six. That is because the first six make economic and environmental sense. Carbon capture and direct air capture programs do not.

We recommend a legislative approach to ensure that a Carbon Management Roadmap is conducted in a professional, analytical manner that **quantifies the risks**, along with any benefits, before Colorado gives further consideration to inviting, and possibly providing gap funding, to carbon capture and direct air capture projects.

Thank you for your consideration of our information and recommendations. We look forward to further dialogue on this important topic.

Sincerely,

Vincent P. Calvano  
CRES Policy Committee  
Colorado Renewable Energy Society

**BEFORE THE COLORADO HOUSE OF REPRESENTATIVES**

**HEARING TO EXAMINE BILL 24-38-1199, Carbon Management**

**WRITTEN SUBMISSION OF  
BENJAMIN LONGSTRETH  
ON BEHALF OF CLEAN AIR TASK FORCE  
MARCH 9, 2023**

Clean Air Task Force (CATF) appreciates the opportunity to provide a written submission to the Colorado General Assembly on Bill 24-38-1199, Carbon Management.

Carbon management, particularly the capture and safe geologic storage of carbon dioxide, is a key tool for protecting our climate and reducing carbon pollution in Colorado and globally. Investments in carbon capture and other carbon management technologies can also strengthen Colorado's industrial sector and support expansion of well-paying jobs in the state. A state roadmap for carbon management can identify key opportunities and accelerate the deployment of carbon capture projects in a deliberate way, considering perspectives of the State, communities, industry, advocates, utilities, and other important stakeholders.

Clean Air Task Force (CATF) is a global nonprofit organization working to safeguard against the worst impacts of climate change by catalyzing the rapid development and deployment of low-carbon energy and other climate-protecting technologies

### **The Scale and Urgency of the Climate and Technology Challenge**

The size of the climate challenge is staggering. We are already seeing the impacts of climate change in Colorado and around the world. Yet global energy and industrial production continue to release over 37 billion tonnes per year of carbon dioxide pollution.<sup>1</sup> To prevent the worst impacts of climate change, we must both cut carbon pollution rapidly and develop techniques to remove carbon dioxide from the atmosphere. Over time, it will be necessary not just to hit net-zero emissions, but also to achieve additional carbon dioxide removal to bring atmospheric carbon dioxide back to safe levels.

Colorado has a strong history of climate leadership in the face of this challenge. Now the state has an opportunity to show global leadership on a key climate strategy by taking steps to conscientiously advance carbon management as a valuable climate solution.

### **The Need for a Low-Carbon Technology Portfolio**

To maximize our chance of meeting the climate challenge within our limited window of time, we need a broad tool kit of technologies and policies. Our technology tool kit will require the continued development and deployment of technologies such as advanced renewable energy, nuclear fission and fusion, carbon capture utilization and storage (CCUS), low-carbon fuels, and geothermal/superhot rock. Numerous modeling efforts studying pathways to decarbonization, including both U.S. decarbonization modeling for the Princeton Net-Zero America study and the synthesis of decarbonization modeling conducted by the International Panel on Climate Change, indicate that we may need a wide range of clean technologies to address emission sources across our economy, including CCUS.

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<sup>1</sup> <https://www.nature.com/articles/d41586-022-03721-5>

## **Carbon Capture is a key part of the Technology Portfolio**

CCUS can play an important decarbonization role across many of the hard-to-reach areas of our energy sector. Within the power sector, CCUS can provide a source of clean, firm (i.e., dispatchable on demand) electricity supply. For the industrial sector, CCUS is an essential technology to enable deep emissions reductions at many industrial facilities. For example, in industrial sectors such as steel and cement, carbon dioxide is produced as process emission, rather than simply as part of a combustion process. This means that even if it were possible to replace the all industrial combustion with electricity (which is very unlikely), there still would be carbon dioxide from process emissions. CCUS also can be applied to the production of zero-carbon fuels such as hydrogen or ammonia.

More broadly, CCUS and direct air capture will play a crucial role in decarbonizing our global energy system. In its Net Zero scenario, the International Energy Agency finds that carbon capture is a key technology and projects that, to stay on track to meet a 2050 net-zero target, the world should be capturing and storing 1,286 million metric tons of carbon dioxide annually by 2030.<sup>2</sup> Similarly, the latest IPCC report published in April 2022 affirmed that carbon capture is an essential technology to limit warming to 1.5 degrees Celsius.<sup>3</sup>

## **The Need for Carbon Management Policy in Colorado**

Carbon management is a key opportunity for Colorado. According to the National Energy Technology Laboratory (NETL) Carbon Storage Atlas, Colorado has 131 gigatons of saline storage potential. NETL and the Colorado Geologic Survey have identified deep saline rock layers appropriate for storing carbon dioxide located below an impermeable cap rock in the Denver Basin and Canyon City Embayment as well as in the Piceance and Sand Wash basins in northwest Colorado.<sup>4</sup>

Colorado is also home to a range of industries and electricity generation facilities that are strong candidates for adding carbon capture. The industrial sector, with 12.9 million metric tons of carbon pollution, is the third-largest source of CO<sub>2</sub> emissions in Colorado, behind electricity generation and transportation.<sup>5</sup> Some industrial facilities, like the cement facility in Florence, Colorado, are already undertaking front-end engineering studies of carbon capture retrofits.<sup>6</sup> There are also carbon capture opportunities in the power sector, which currently emits approximately 28 million metric tons of carbon pollution in the state.

Smart planning can accelerate adoption of carbon management projects and reduce the costs of deployment. Carbon management planning can allow multiple sources to share carbon dioxide transportation and geologic storage infrastructure, significantly lowering costs. The

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<sup>2</sup> <https://www.iea.org/reports/carbon-capture-utilisation-and-storage-2>

<sup>3</sup> <https://www.catf.us/2022/04/what-does-latest-ipcc-report-say-about-carbon-capture/>

<sup>4</sup> <https://coloradogeologicalsurvey.org/publications/co2-sequestration-potential-colorado/>

<sup>5</sup> <https://www.eia.gov/environment/emissions/state/>

<sup>6</sup> [https://netl.doe.gov/sites/default/files/netl-file/21CMOG\\_CCUS\\_Jelen.pdf](https://netl.doe.gov/sites/default/files/netl-file/21CMOG_CCUS_Jelen.pdf)

process of creating a statewide carbon management plan should also help to indicate how current federal incentives like the 45Q tax credit for geologic storage of carbon dioxide can drive deployment of carbon capture projects in Colorado and whether additional supportive policies and state funding is necessary to achieve the level of investment in carbon management needed for the state to meet its climate goals. The federal 45Q tax credit, which was raised to \$85 per ton as part of the Inflation Reduction Act, will cover much of the cost of CCUS for many sectors and in some cases may cover the full costs. This is important as it means that a relatively small additional contribution from the state can make the difference for projects that fall just over the costs that 45Q would cover.

Carbon capture can also boost good jobs in Colorado. Rhodium group has estimated that in the Rocky Mountain, Midwest and Gulf regions near-term deployment of carbon capture could generate 64,000 jobs through investments in carbon capture and 43,000 jobs from carbon capture retrofit operations.<sup>7</sup>

Importantly, deployment of carbon capture also provides an opportunity to improve air quality in the State. As the United States Department of Energy and Environmental Protection Agency have explained, significant reductions in sulfur dioxide and nitrogen dioxide pollution can be achieved as co-benefits of adding carbon capture equipment.<sup>8</sup>

In summary, carbon capture utilization and storage and carbon management is a key tool for decarbonization in Colorado, with economic and air quality benefits. Smart planning can accelerate progress and set the stage for investments by government and the private sector to deploy carbon capture at scale. CATF looks forward to continuing to work with the State and stakeholders as Colorado develops smart carbon management policies.

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<sup>7</sup> [https://rhg.com/wp-content/uploads/2021/04/The-Economic-Benefits-of-Carbon-Capture-Investment-and-Employment-Opportunities\\_Phase-III.pdf](https://rhg.com/wp-content/uploads/2021/04/The-Economic-Benefits-of-Carbon-Capture-Investment-and-Employment-Opportunities_Phase-III.pdf)

<sup>8</sup> <https://www.epa.gov/system/files/documents/2022-09/August%202022%20CCS%20Information%20Session.pdf>



## CONTACT

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March 09, 2023

House Energy and Environment Committee  
Colorado General Assembly  
200 East Colfax Avenue  
Denver, CO 80203

## Re: Support HB23-1210 Carbon Management and L.001 (Dickson)

Chairwoman Kipp, and Members of the Committee:

For more than 30 years WRA has worked alongside non-profit allies and in partnership with Colorado state legislators, regulators, agencies, and the Governor's office to craft smart policy solutions to address climate change. We support policies that help to drive down greenhouse gas emissions, that improve our air quality, that protect the health of our river systems, wildlife, and drinking water, and that support our communities.

Today we write in support of Rep. Dickson's HB23-1210, Carbon Management measure, as amended by L.001.

WRA works to reduce carbon emissions in line with the best science and advocates for investments in clean energy technologies. We understand the need to study a variety of technological solutions needed to help ensure Colorado is making progress on its climate goals.

We must ensure that as these new avenues are explored that Colorado is prioritizing health and safety, and not extending reliance on fossil fuels. In doing this we must also evaluate the full lifecycle of emissions of carbon capture and related technologies and ensure the process for developing a carbon management Roadmap includes sufficient opportunity for stakeholder input.

We appreciate the sponsor's willingness to revise the proposal to include safeguards for health and safety, evaluating the risks of extending the life of fossil fuel infrastructure and co-pollutants, and considering impacts to communities, with a focus on reducing impacts to disproportionately impacted communities.

This bill is a good next step in our state's efforts to continue explore avenues to reduce carbon emissions and move towards a decarbonized economy. We thank Rep. Dickson for bringing this bill forward and House Energy and Environment Committee Members for your consideration. We urge you to vote "yes" on HB23-1210.

Sincerely,

Gwen Farnsworth  
**Deputy Director of State Advocacy**  
Western Resource Advocates  
[gwen.farnsworth@westernresources.org](mailto:gwen.farnsworth@westernresources.org)

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Western Resource Advocates provides on the ground solutions to climate change. WRA works with policymakers and other advocates to advance clean energy; protect air, land, water, and wildlife; and sustain the lives and livelihoods of the West. For more information, visit [WesternResourceAdvocates.org](https://WesternResourceAdvocates.org) and follow us on Twitter [@wradv](https://twitter.com/wradv).

Testimony to the House Energy and Environment Committee on HB23-1210  
Morey Wolfson March 9, 2023

In the past few years, a proposition has emerged that we ought to go beyond RE and EE, and turn our attention to the idea that we can somehow continue to operate coal and gas-fired generation, but minimize the emissions by capturing the CO<sub>2</sub> before it goes in to the atmosphere. Or suggest that we should explore technological ways to pull CO<sub>2</sub> out of the atmosphere.

On the surface, it sounds like a reasonable idea, and ought to be included in a Roadmap for Carbon Management in Colorado.

There are 420ppm of CO<sub>2</sub> in the atmosphere.  
It was at 285ppm before the industrial revolution.

1ppm of CO<sub>2</sub> weighs 8 billion tons.  
But to attach relevance to that fact, we need to place a price for carbon capture and direct air capture. I suggest that we go with \$100/ton - it is a low-ball, highly aspirational number.

We multiply 8 billion tons times \$100/ton.  
Wait! That's \$800 billion.

To bring the concentration of CO<sub>2</sub> from 420 to 419ppm would cost \$800 billion.  
For a quick comparison, the Colorado State budget is \$43 billion.

If not amended, HB23-1210 currently instructs the Roadmap to **“attract,” “encourage,” “support,” “catalyze,” “apply gap funding or other support,” and “foster”** these two questionable enterprises.

Please consider extracting out encouragement for carbon capture and direct air capture from the otherwise smart plan to produce a Carbon Management Roadmap.