

EARTHWORKS

March 31, 2021

Air Pollution Control Division
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80246
Comments submitted via email to cdphe.commentsapcd@state.co.us

Dear APCD:

Thank you for the opportunity to submit comments on the Colorado Air Pollution Control Division (the Division)'s 2021 Greenhouse Gas Inventory Report (the Inventory). We appreciate that the Division has moved to annual revisions of the Inventory (as opposed to the previous 5-year intervals), which will provide for more detailed and regular tracking of emissions trends over time.

Earthworks is a national nonprofit organization committed to protecting communities and the environment from the impacts of mining and energy development while seeking sustainable solutions. For nearly 30 years, we have fulfilled our mission by working with communities and grassroots groups to reform government policies, improve corporate practices, influence investment decisions, and encourage responsible materials sourcing and consumption.

Earthworks' comments are focused on the section of the Inventory related to the oil and gas sector and the imperative of making the Inventory more comprehensive and publicly available. The following recommendations will allow CDPHE to more accurately track the greenhouse gas (GHG) emissions from oil and natural gas production so that state agencies, researchers, and the public can properly assess Colorado's progress towards its emission reduction goals. Importantly, the state will need to adjust emission reduction goals and regulations if CDPHE and other agencies find that existing measures are falling short.

1. Oil and Gas Emissions are Significantly Higher with the Inventory Revision

In section 1.7 of the Inventory, the Division presented re-estimations of historical emissions using a new oil and gas emissions calculation methodology; and then compared the new estimates to the emissions estimates that were based on a previous methodology (pp. 23-25). The 2005 oil and gas sector emissions estimates increased significantly from 8.083 MMT carbon dioxide equivalent (CO_2e) in the old mode (exhibit 1-11) to 20.166 MMT CO_2e in the new model (exhibit 1-12)—a 150% increase.

Dedicated to protecting communities and the environment from the adverse impacts of mineral and energy development while promoting sustainable solutions.

1612 K St. NW, Suite 904
Washington, DC 20006
202.887.1872
EARTHWORKS.ORG

earthworksaction
@earthworks

carbon neutral • 100% PCW

The fact that the 2005 emissions estimate increased so significantly due to a change in methodology indicates that oil and gas sector emissions are higher than the state has presumed in the past, and continually increasing. Notably, the same change occurred when New Mexico revised the methodology used to estimate greenhouse gas emissions from the oil and gas sector—with volumes four times higher in a 2020 report than was previously estimated using national data.[1]

This trend is unsurprising given the fact that, as Colorado's Greenhouse Gas Pollution Reduction Roadmap (the Roadmap) clearly stated (p. vi), oil and gas production is among the top four sources of emissions in Colorado, and the industry overall is the largest source of non-combustion sources in the state. The logical conclusion to draw is that Colorado should be much more aggressive in cutting GHG emissions.

The size of the estimation change in the Inventory is especially important because Colorado uses 2005 GHG estimates as the baseline for the emission reduction goals established in the state Climate Action Plan. For example, using the originally calculated 2005 emission levels (8 MMT) as a baseline, an emissions reduction goal of 50% by 2030 would call for a 4 MMT reduction in CO_2e (from 8 MMT to 4 MMT per year). A 90% reduction by 2050 would call for a 7.2 MMT reduction in CO_2e (8 MMT to 0.8 MMT per year).

However, because the revised methodology changed the 2005 emissions estimate to 20 MMT, a 4 MMT reduction by 2030 would be only 20% (from 20 MMT to 16 MMT per year). A 7.2 MMT reduction by 2050 would be only a 36% reduction (from 20MMT to 12.8 MMT per year).

Both of these reduction levels would fall far short of the state's established and legally required goals. Therefore, CDPHE, the Energy Office, and other state agencies should revise and strengthen their oil and gas sector emission reduction strategies in order to realize Colorado's climate goals.

Furthermore, the 2019-year emissions and forward-looking projections in the Inventory were derived from the Roadmap (p.1). Now that the 2021 Inventory has adopted a new methodology for oil and natural gas emissions, the Division should ensure that the Roadmap's emissions projections are updated to reflect the new methodology; in other words, that the Roadmap and Inventory use consistent estimates.

2. The Division Should Adopt the AR 5 20-year GWP for methane

To determine the climate impact of different greenhouse gases, scientists calculate their inherent warming ability in relation to carbon dioxide (CO_2), the climate pollutant that is generally emitted in the largest volumes. CO_2 is assigned a value of "1" and other gases are given values relative to that baseline, called Global Warming Potential (GWP). This allows for the comparison of the potency of different greenhouse gases and the calculation of overall volumes in terms of "carbon dioxide equivalent" (CO_2e).

---

[1] New Mexico Interagency Climate Change Task Force, NM Climate Strategy, 2020 Progress and Recommendations.
https://www.climateaction.state.nm.us/documents/reports/NMClimateChangeReport_2020.pdf

The Inventory uses a 100-year timeline GWP, based on an international standard from 2007, a metric that puts methane at 28-36 times worse for the climate than CO_2. [2] For this and future inventories, CDPHE should adopt the more recent 20-year timeline from the IPCC Fifth Assessment Report (AR 5) from 2014 instead.

The difference in GWPs has significant implications for evaluating the gap between emissions that operators report to the CDPHE's GHG inventory and the actual reductions needed to meet climate goals. Using the 100-year GWP has the effect of lowering the projected climate impact of methane emissions and the volume calculated as CO_2e. Using a 20-year GWP for methane is important because it better reflects the real impacts of the gas, which remains in the atmosphere for only about 12 years. [3] With this GWP, methane is defined as 84-86 times as potent for the climate as carbon dioxide.

The Inventory states that the decision to continue to use the AR 4, 100-year GWP is to maintain consistency with current practices across different reporting programs (p.2). In this report, the Division states that the Inventory will continue to use the AR4, 100-year GWP "until national and international standards for reporting are revised" (p. 100).

Instead of waiting for mandatory changes from out of state, the Division should take the lead in updating its emissions methodology to more accurately track its progress towards meeting state climate goals. This approach would be consistent with Colorado's prior willingness to lead on the development of state methane control rules for the oil and gas sector and to establish robust climate emission reduction goals.

The Inventory itself shows that using different GWPs affects emissions reduction projections. Exhibit ES-9 (p.10) shows the Division's GHG percent reduction projections out to 2050 from the 2005 baseline using all four combinations of AR4 and AR5 100 year and 20-year GWP values. This graph shows approximately a 10 percent difference in projected emissions reductions by 2050 when using the AR4, 100-year versus the AR5, 20-year GWP.

It is unclear how the Division reached this conclusion or the basis for comparison. Earthworks would expect a larger difference in projected emission reductions given that 10 tons of methane equals 840-860 tons of CO_2e at the 20-year timescale, but only 280-360 tons at the 100-year timescale. The Division should provide more insight into how the GWP emission projections were calculated and why the difference is relatively small.

Still, even a 10 percent difference in projected emission reductions is significant given the state's ambitious climate goals and the growing gap between those goals and emission realities, in particular with regard to the oil and gas sector. A recently released NRDC and Sierra Club report points out that Colorado is currently not on track to meet its emission reduction targets, even with projections based on the more limited AR4, 100-year GWP.[4]

---

[2] US Environmental Protection Agency, Understanding Global Warming Potentials, https://www.epa.gov/ghgemissions/understanding-global-warmingpotentials

[3] Intergovernmental Panel on Climate Change, Fifth Assessment Report, Climate Change 2013: The Physical Science Basis, Contribution of Working Group I.

[4] Evolved Energy, GridLab, Natural Resources Defense Council, and Sierra Club, *Committing to Climate Action: Equitable Pathways for Meeting Colorado's Climate Goals*, 2020..

3. The Division should make the Inventory more comprehensive and accessible

In Earthworks' 2020 report, *Loud and Clear: What public regulatory complaints reveal about Colorado's oversight of oil and gas pollution and whom it serves*, we examined Colorado's pollution tracking systems and developed a series of recommendations to expand their coverage and improve their accessibility.[5]

The following recommendations relate to both the Inventory and overall state emissions data. These changes would enable the Division and the public to more easily assess Colorado's progress towards its emissions goals and adjust emissions reduction policies and regulations if they are falling short.

A. The Division should expand the Inventory to ensure inclusion of the full range of emission sources in the oil and gas sector. Currently, the Inventory's natural gas and oil production section appears to only track estimated fugitive methane emissions from the extraction and production of natural gas and oil, and CO_2 emissions from venting and flaring natural gas (p.68). If direct CO_2 emissions from production and extraction are in fact included (e.g., represented as CO2e alongside methane), then CDPHE needs to make this clear. Otherwise, this limitation omits key sources of emissions (e.g., CO_2 from engines, compressors, and other combustion sources), the inclusion of is necessary to provide a realistic, comprehensive analysis of GHG emissions in Colorado.

B. Any future inventories for ozone-forming pollutants and greenhouse gases should be publicly available online, be searchable by facility name, year, and location, and allow the public to download data. Residents, researchers, and advocates should be able to see which pollutants and levels of pollution operators are reporting to the state and to track changes over time.

4. The Division should include independent measurements and verification of operator submitted numbers

Right now, the Division estimates oil and natural gas emissions by taking monthly production data and calculates emissions using a combination of emission factors, and in the case of natural gas emissions, some gas sampling data and methane flyover study data (pp. 69-71).

Operators should continue to be required to report production data. However, the Division's emission estimates assume that equipment is functioning as designed – which too often is not the case. Several studies demonstrate that measured emissions can be significantly higher than what operators report.[6]

To more clearly understand how much pollution reduction is needed to reach Colorado's climate goals, the Division should expand field measurement projects to determine actual volumes of oil and gas pollution and make those projects publicly available. At a minimum, the Division should conduct

---

[5] Earthworks 2020, *Loud and Clear: What public regulatory complaints reveal about Colorado's oversight of oil and gas pollution and whom it serves*, https://www.earthworks.org/publications/loudandclear-co/

[6] Alvarez, Zavala-Araiza, Lyon, et al. "Assessment of methane emissions from the US oil and gas supply chain." *Science*, 2018; Barkley, Davis, Feng, et al. "Forward Modeling and Optimization of Methane Emissions in the South Central United States Using Aircraft Transects Across Frontal Boundaries." *Geophysical Research Letters*, 2019.

frequent and rigorous volumetric measurements near significant pollution sources (e.g., compressor stations, processing plants, and large well pads), as well as frequent and extensive methane flyover surveys. The Division should compare direct emissions measurements to the estimated measurements to ensure that the emissions calculation methodology is as accurate as possible. All direct measurement data should be publicly available.

In addition, the Division should consider using its methane flyover data and any other potential indications of excessive emissions at particular sites in enforcement actions. This approach is expanding in New Mexico, where the Environment Department has found larger than previously understood leakage rates due to more extensive flyover measurements and leveraged optical gas imaging and other information (including field documentation conducted by Earthworks) to issue violations.[7]

5. The Division should develop an excess emissions inventory

In addition to the existing Inventory, the Division should develop an "excess emissions" inventory to track and assess events that cause pollution above permitted levels (e.g., malfunctions, blowdowns, venting from unlit flares). These events are not currently tracked in the Inventory. Given Colorado's climate goals and expressed commitment to reining in oil and gas pollution, volatile organic compounds, hazardous air pollutants, and greenhouse gases emitted during excess events should be tracked and leveraged by the Division in enforcement actions.

The resulting data and information on agency response to excess emission events should be made publicly available on an annual basis. These data are necessary to determine whether state policies and regulations to rein in climate pollution are actually effective, or not. More data on greenhouse gas releases would also help paint a clearer picture on oil and gas impacts on health, given the role of methane and ethane in the formation of ozone.

Thank you for your time and consideration.

Sincerely,



Nadia Steinzor
Senior Policy Analyst and Research Manager
202-887-1872 x109
nsteinzor@earthworks.org

[7] See December 2020 press release and linked map of findings and actions at https://www.env.nm.gov/wp-content/uploads/2020/12/2020-12-21-Flyovers-reveal-high-leak-rates-in-Permian.pdf