



The Climate Report 2020:

Greenhouse Gas Emissions from Public Lands

As the world works to respond to the dire warnings issued last fall by the United Nations Environment Programme, the Trump administration continues to open up as much of our shared public lands as possible to fossil fuel extraction.¹ And while doing so, the federal government continues to keep the public (aka the owners of these resources) in the dark on the mounting greenhouse gas emissions that would result from drilling on our public lands.

At the same time, we've seen this administration water down policies and

regulations meant to protect the public and the environment from these exact decisions. New policies have made it cheaper and easier for fossil energy corporations to gain and hold control of public lands. And they have hidden from public view the implications of these decisions for taxpayers and the planet.

This report seeks to pull the curtain back on this situation and shed light on the range of potential climate consequences of these leasing decisions.

¹ UN. 26 Nov. 2019.
[https://www.unenvironment.org/news-and-](https://www.unenvironment.org/news-and-stories/press-release/cut-global-emissions-76-percent-every-year-next-decade-meet-15degc)

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Key Takeaways:

- The federal government cannot manage what it does not measure, yet the Trump administration is actively seeking to suppress disclosure of climate emissions from fossil energy leases on public lands.
- The leases issued during the Trump administration could result in lifecycle emissions from extraction and end-use ranging between 1 billion and 5.95 billion metric tons (MT) of carbon dioxide equivalent (CO₂e). That equates to more than half of the annual emissions of China – by far the world’s worst emitter.²
- Taking into account the potency of shorter-lived climate emissions like methane, lifecycle emissions resulting from the development of these leases could be as high as 6.6 billion MT CO₂e.
- These leasing decisions have significant and long-term ramifications for our climate and our ability to stave off the worst impacts of global warming. Emissions from public lands are on track to drastically exceed the level in line with what leading climate science says is necessary to avoid the worst effects of warming.
- Our public lands and waters are supposed to be managed in the public interest and should play a leading role in our fight against climate change. But under this administration, management decisions are only accelerating the climate crisis and serving corporate greed.

Background

The U.S. Federal Government is one of the largest energy asset managers in the world – responsible for over 2.4 billion acres of subsurface mineral rights, including resources like coal, crude oil, and natural gas.³ In 2018, our public lands and waters produced 39% of total U.S. coal (282 million tons), 21% of total U.S. oil (826 million barrels) and 14% of total U.S. gas (4.3 trillion cubic feet).

The Department of the Interior (DOI) is charged with making decisions about how our public lands and waters are managed, including whether, when and where to lease lands to private companies for fossil energy development, including oil and gas. Since taking office, the Trump administration has offered more than 461 million acres of public lands and waters for oil and gas leasing from January 2017 through January 2020. This

² WRI's Climate Analysis Indicators Tool (CAIT) standardizes historic country-level GHG emissions data for 186 countries. Source: CAIT Climate Data Explorer. 2017. Country Greenhouse Gas Emissions. Washington, DC: World Resources Institute. Available online at <https://www.climatewatchdata.org/ghg-emissions?sectors=410>

³ TWS. "In The Dark: The hidden climate impacts of energy development on public lands." January 2018. Available at: https://www.wilderness.org/sites/default/files/media/file/In%20the%20Dark%20Report_FINAL_Feb_2018.pdf

includes 24,182,066 million onshore acres and 437,485,661 offshore acres.

The federal government does not regularly track climate emissions associated with fossil energy development on public lands, nor has it ever set reduction goals for these emissions.

Previous analysis from The Wilderness Society's Federal Lands Emissions Accountability Tool (FLEAT) modeling (confirmed by a 2018 report from the United States Geological Survey) found that the lifecycle emissions from the production and combustion of fossil fuels produced on public lands as a result of the federal leasing program are equivalent to over 20% of total U.S. GHG emissions.^{4 5}

The Trump administration is actively seeking to suppress disclosure of the full sweep of these emissions. Well-established scientific methods for estimating GHG emissions from lease development exist and have been applied by several BLM field offices to analyze the magnitude and severity of potential production and the resulting range of effects on climate change and the environment. But this practice is not in standard use at the agency. Rather, this administration is trying to subvert this type of analysis. In January 2020, Trump's Council on Environmental Quality (CEQ)

proposed a massive rollback of the National Environmental Policy Act (NEPA) giving federal agencies a permission slip to ignore how their own actions might contribute to climate change, dramatically reducing public input in the process.⁶ The changes would essentially allow federal agencies to avoid fully estimating emissions for these leases, enable agencies to skirt accounting for the cumulative effects of emissions across permitted projects, and fail to encourage agencies to identify lower-emitting alternatives.

Recent court decisions have determined that federal agencies are legally required to include climate impacts of a proposed action such as a lease sale. Judges across the country have ruled that the federal government bypassed NEPA when approving projects on public lands without fully disclosing the impact on greenhouse gas emissions and climate.⁷ However, agency attempts to comply with these directives have fallen well short of applying leading practices to this analysis, and agencies are not currently directed to make a decision in line with climate protection regardless of the results.

⁴ TWS. "Federal Lands Emissions Accountability Tool." Available at: <https://www.wilderness.org/articles/article/federal-lands-emissions-accountability-tool>

⁵ Merrill, M.D., Sleeter, B.M., Freeman, P.A., Liu, J., Warwick, P.D., and Reed, B.C., 2018, Federal lands greenhouse emissions and sequestration in the United States—Estimates for 2005–14: U.S. Geological Survey Scientific Investigations Report 2018–5131, 31 p., Available at: <https://pubs.er.usgs.gov/publication/sir20185131>

⁶ CEQ. 2020. "Press release: CEQ issues proposed rule to modernize its NEPA regulations." January 2020. Available at: <https://www.whitehouse.gov/wp-content/uploads/2020/01/20200120-Final-NPRM-Press-Release.pdf>

⁷ Cases that have required federal agencies permitting fossil fuel extraction on public lands to consider the climate and GHG implications of the decision in their NEPA analyses include: High Country Conservation Advocates v. U.S. Forest Service, 52 F. Supp. 3d 1174 (D. Colo. 2014); Montana Env'tl. Info. Ctr. v. U.S. Office of Surface Mining, 274 F. Supp. 3d 1074 (D. Mont. 2017); Wild Earth Guardians v. BLM, 870 F.3d 1222 (10th Cir. 2017); Western Org. Res. Councils v. BLM, 2018 U.S. Dist. LEXIS 48500 (D. Mont. Mar. 23, 2018); Wild Earth Guardians v. Zinke, 368 F. Supp. 3d 41 (D. D.C. 2019); and Citizens for Clean Energy and The Northern Cheyenne Tribe v. U.S. Dep't of the Interior, 2019 U.S. Dist. LEXIS 67259 (D. Mont., Apr. 19, 2019).

Analysis of Emissions from Trump Leases

In the absence of comprehensive emissions assessments of these actions by the Department of the Interior, The Wilderness Society conducted its own analysis in order to understand the range of potential climate consequences of these leasing decisions.

Methods

Our analysis evaluates the GHG emissions from lease parcels sold between January 2017 and January 2020. To determine emissions, we combined location-specific lease sale data with formation-specific assumptions used by the Energy Information Administration (EIA) to estimate potential production from the leased parcels, and then applied standard emission factors employed by the Environmental Protection Agency (EPA) to estimate GHG

emissions resulting from these lease sales.⁸ We generated three development scenarios using assumptions underpinning the EIA's *Annual Energy Outlook 2019*. We employ a number of conservative assumptions in this analysis. Potential production and resulting emissions from these lease sales could very well be even higher than these estimates. Please see the technical appendix for a full description of the methods used in this analysis.

Findings

Since January 2017, the Trump administration has sold 4,928 parcels (or more than 9.9 million acres) of public lands to oil and gas companies for development, including more than 5 million acres onshore and more than 4.9 million offshore acres.

⁸ Using location-specific parameters is key to increasing the robustness of projected production estimates, and, thus, better-informed life cycle emissions analysis. Using information from a

representative gas or oil well in these regions further simplifies the process for the federal government to estimate emissions potential from lease sales.

	2017		2018		2019	
	# of parcels	# of acres	# of parcels	# of acres	# of parcels	# of acres
Wyoming	472	390,635	624	646,865	1,000	1,195,502
Utah	64	69,519	219	336,643	176	224,779
Colorado	113	102,192	103	67,981	71	51,382
New Mexico (TX/OK/KS)	89	22,510	273	141,722	126	63,985
Alaska	7	79,998	16	174,044	92	1,051,216
Montana/Dakotas	119	45,218	81	48,758	159	90,641
Nevada	43	78,427	35	61,944	46	67,759
Eastern States	35	2,684	59	6,786	23	7,012
Arizona	-	-	2	3,040	-	-
Sum Onshore	942	791,183	1,412	1,487,783	1,693	2,752,276
Gulf of Mexico	229	1,288,432	280	1,548,933	358	1,983,227
Alaska (Cook Inlet)	14	76,615	-	-	-	-
Sum Offshore	243	1,365,047	280	1,548,933	358	1,983,227
National Total	1,185	2,156,230	1,692	3,036,716	2,051	4,735,503

Figure 1a. Federal oil and gas leases sold at auction by year between January 2017 and January 2020

	# of parcels	# of acres
Wyoming	2,096	2,233,002
Utah	459	630,941
Colorado	287	221,555
New Mexico (TX/OK/KS)	488	228,217
Alaska	115	1,305,258
Montana/Dakotas	359	184,617
Nevada	124	208,130
Eastern States	117	16,482
Arizona	2	3,040
Sum Onshore	4,047	5,031,242
Gulf of Mexico	867	4,820,592
Alaska (Cook Inlet)	14	76,615
Sum Offshore	881	4,897,207
National Total	4,928	9,928,449

Figure 1b. Federal oil and gas leases sold at auction between January 2017 and January 2020

The Wilderness Society researchers found that more than 88% of the lower-48 onshore acres leased under the Trump administration to date are located over six major basins (Greater Green River Basin, Powder River Basin, Uinta-

Piceance, Paradox Basin, Big Horn Basin and Permian Basin). These basins are responsible for a large portion of the oil and gas production in the western US that occurs on public lands.

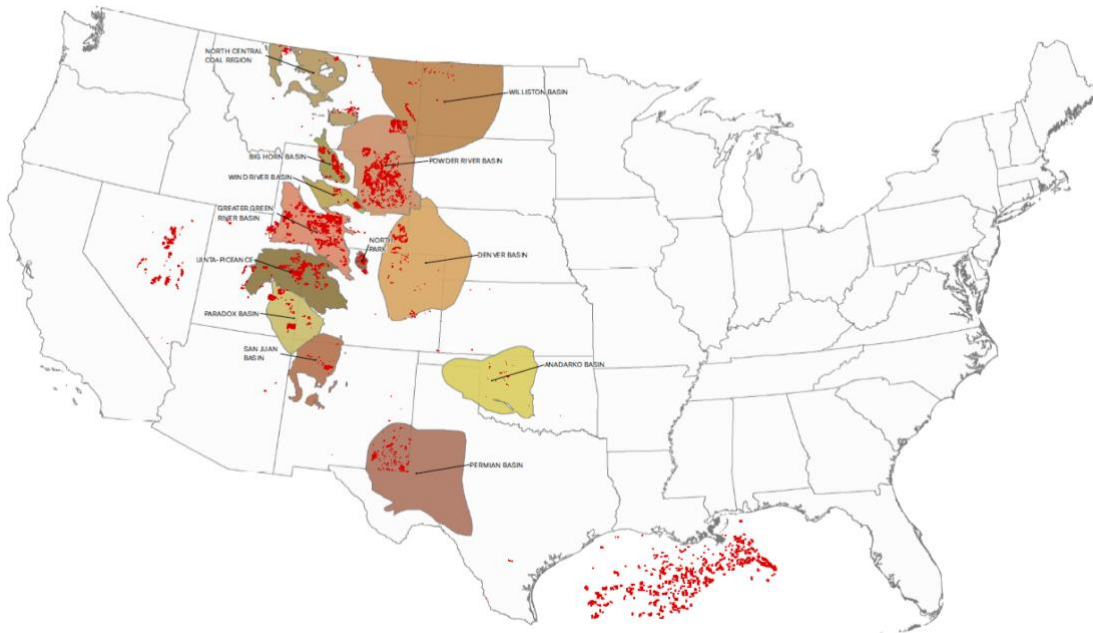


Figure 2. Federal oil and gas leases sold at auction between January 2017 and January 2020, overlaying major oil and gas formations.

The potential climate impact of leasing decisions is significant. Looking at three production scenarios under varying future market conditions, The Wilderness Society researchers found that development of these leases could result in lifecycle emissions between 1 billion and 5.95 billion MT CO₂e (see Figure 3).⁹ Of these potential emissions, onshore leasing during this period accounts for roughly 62% of total estimated emissions (3.68 billion MT CO₂e) while offshore leasing accounts for 38% (2.27 billion MT CO₂e). (See

Figure 4 for further breakdown by states and offshore regions.)

To put that in context, high rates of development of these leases could result in lifecycle emissions that equate to more than half of the annual emissions of China – by far the world’s worst emitter.¹⁰ Even under a conservative “low-development scenario,” potential emissions of these leases sold so far under the Trump administration are equivalent to the total annual emissions of Brazil (roughly 1 billion MT CO₂e).

⁹ Taking into account the potency of shorter-lived climate pollutants like methane, lifecycle emissions resulting from the development of these leases could be as high as 6.6 billion MT CO₂e.

¹⁰ WRI’s Climate Analysis Indicators Tool (CAIT) standardizes historic country-level GHG emissions data for 186 countries.

Source: CAIT Climate Data Explorer. 2017. Country Greenhouse Gas Emissions. Washington, DC: World Resources Institute. Available online at <https://www.climatewatchdata.org/ghg-emissions?sectors=410>

	Low	Reference	High
Onshore	274	2,459	3,684
Offshore	732	1,367	2,271
Total	1,006	3,826	5,955

Figure 3. Estimated lifecycle greenhouse gas emissions resulting from federal oil and gas leases sold at auction under the Trump administration in varying development scenarios (Million Metric Tons of CO₂e)

	Total Jan. 2017 - Jan. 2020	2017	2018	2019
Wyoming	1,528,618,863	267,412,223	442,816,460	818,390,179
Utah	1,329,011,201	146,434,500	709,103,257	473,473,445
Colorado	224,027,720	103,332,539	68,739,719	51,955,462
New Mexico (TX/OK/KS)	147,043,488	14,503,518	91,313,530	41,226,440
Alaska	357,654,157	21,920,277	47,689,851	288,044,029
Montana/Dakotas	73,874,013	18,093,865	19,510,387	36,269,761
Nevada	13,272,450	5,001,290	3,950,169	4,320,991
Eastern States	10,597,328	1,725,715	4,363,152	4,508,462
Arizona	28,735	-	28,735	-
Sum Onshore	3,684,127,956	578,423,927	1,387,515,260	1,718,188,768
Gulf of Mexico	2,111,928,889	564,469,418	678,596,394	868,863,076
Alaska	158,748,000	158,748,000	-	-
Sum Offshore	2,270,676,889	723,217,418	678,596,394	868,863,076
National Total	5,954,804,844	1,301,641,346	2,066,111,654	2,587,051,845

Figure 4. Lifecycle emissions of federal oil and gas leases sold at auction under Trump in a high development scenario (Metric Tons of CO₂e)

Discussion

The federal government has broad discretion over how our public lands and waters are put to use, but it cannot manage what it does not measure. Continuing to lease public lands and waters for oil and gas development without considering the climate impacts will make certain that we miss our emission reduction targets.

In its “Special Report” released in October 2018, the Intergovernmental Panel on Climate Change (IPCC) recommended reducing global emissions by at least 45% from a 2010 baseline by 2030 for a chance at limiting warming below 1.5 degrees Celsius above pre-industrial

levels--the line in the sand to avoid catastrophic climate change.¹¹

Applied to federal lands, our projections show that, at the current pace of leasing, emissions from the production and combustion of fossil fuels (oil, gas, and coal) sourced from public lands are projected to fall well short of this 2030 target. Currently emissions from the production and combustion of fossil fuels produced on public lands are projected to decline by only 19% by 2030, far short of the 45% minimum decrease needed for US public lands to be on pace with what scientific consensus says is needed to avoid a 1.5°C rise (see Figure 5).

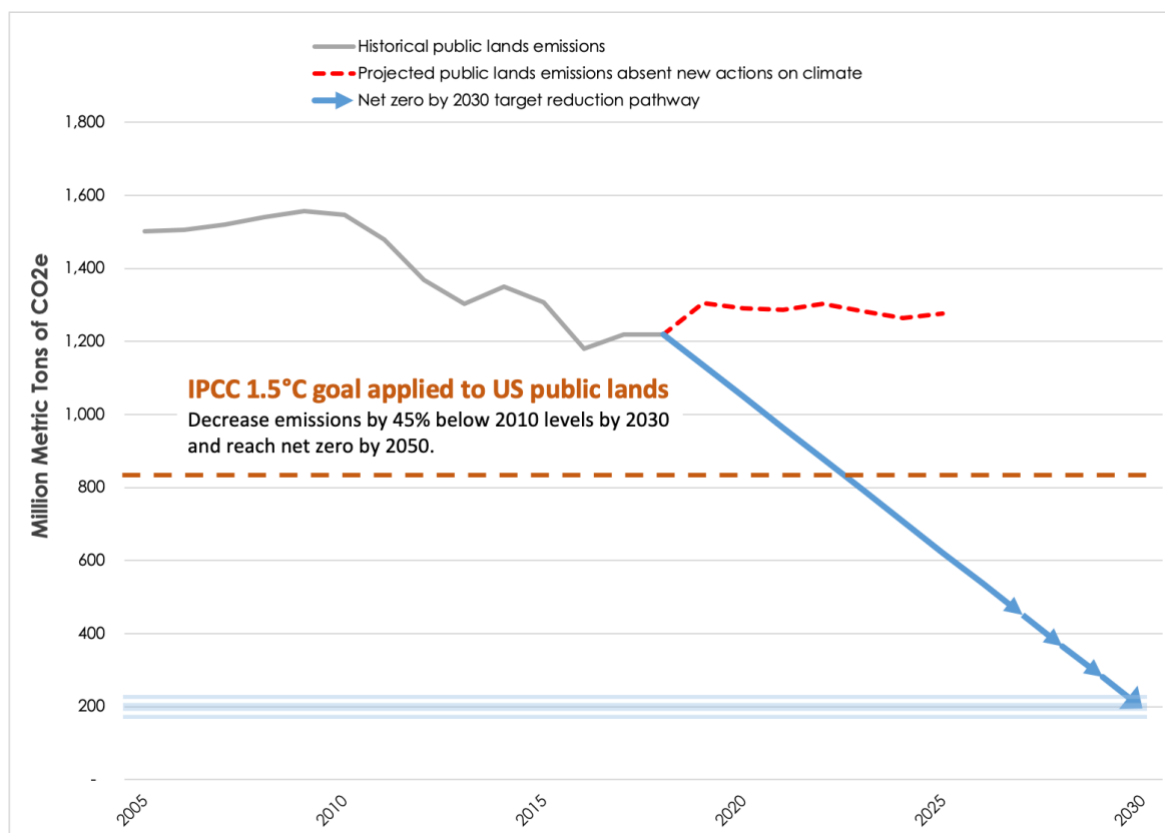


Figure 5. Public lands emissions must be reduced

¹¹ IPCC, 2018. “Special Report on Global Warming of 1.5 °C.” (Intergovernmental Panel on Climate Change, 2018). Available at <https://www.ipcc.ch/sr15/>

What's worse, this administration is removing key policies necessary to understand the scope of this problem and make climate-smart decisions. This administration is working to obscure climate impacts from the public requiring agencies to ignore well-established methods that have been employed by a number of federal agencies for over a decade. Instead, the administration is blindly accelerating the rate of leasing fossil energy resources without regard to the climate impacts, racking up a significant carbon debt that will limit the decision space to reduce emissions for future administrations and make solutions more expensive.

The full sweep of this administration's actions reaches beyond just land management decisions. Directing the federal government lease at this pace with utter disregard for climate emissions limits sends chilling signals to the market and the public about the urgency of action to reduce carbon emissions.

Climate Plan for Public Lands

We need a comprehensive climate plan for public lands to ensure these lands are a leading part of the climate solution. A key part of that plan is taking aggressive action to meaningfully reduce emissions from fossil energy development. We must start equitably managing

a steep decline in emissions from fossil fuel energy—and the public lands should be leading the way, ahead of the pace demanded by current climate science by setting a goal of net zero emissions by 2030.

The Department of the Interior has a number of tools at its disposal.¹² These include drastically reducing needless methane pollution by reinstating a federal methane and natural gas waste regulation informed by science-based recommendations; eliminating production subsidies and loopholes for fossil energy; requiring developers to mitigate climate impacts; and rapidly phasing down leasing and production. Additionally, the federal government should protect major carbon storing landscapes and invest in programs, incentives, and partnerships that promote responsible renewable energy development and public land restoration to create new sustainable economic opportunities.

The management of these lands and mineral resources is entirely in the hands of our elected leaders and agency officials. As the largest single land holder and energy asset manager in the nation, the federal government must ensure our public lands and waters are managed for climate progress.

¹² Nathan Ratledge, Steven J. Davis and Laura Zachary. "Public lands fly under the climate radar." *Nature Climate Change*. vol.

9:89-93. February 2019. Available at <https://www.nature.com/articles/s41558-019-0399-7>

Technical Appendix

The Department of the Interior provides federal onshore historic lease sales data in a geographic information system (GIS)-ready format through BLM's Navigator website along with detailed records of the lease locations using the Public Land Survey System.

To estimate per-well direct emissions at the well site and to calculate future potential development, the authors matched geolocations of the lease parcels sold from January 2017 through January 2020 with major oil and gas formations (as shown in Figure 2).

To estimate the number of wells and associated oil and gas production volumes that could reasonably occur on these lease parcels for the reference scenario, the researchers use formation-specific factors from the EIA's National Energy Modeling System (NEMS) Oil and Gas Supply Module (OGSM). The main OGSM inputs include anticipated well densities, estimated ultimate recoveries (EUR) per well, and type curve analyses of existing wells in a region. The OGSM includes the latest sub-play specific factors to calculate basin specific EUR per well. These factors include the production profile of individual wells over time (initial production rates and the production decline curves for representative wells), the cost of drilling and operating those wells, and the revenues generated by those wells.

The authors use standard EPA-based calculation methods and emission factors to

account for the reasonably foreseeable downstream emissions that would result from the processing, refining, and ultimate combustion of oil and gas. Anticipated production estimates are characterized by uncertainty due to a number of unknown future market conditions but are useful to understand the potential GHG emissions that could occur under a given range of possible prices of oil and technological progress that enable varying levels of development. The decision to drill in an area is highly dependent on the price of oil and the rate of technological improvements can have significant impact on the costs of development. Uncertainty is especially high in new geological emerging plays where relatively few wells have been previously drilled. To assess a range of development scenarios given future market uncertainties, the researchers also model high and low price/technology scenarios.

The onshore reference "middle" scenario uses average regional well spacing and EUR per well from EIA's Assumptions to the Annual Energy Outlook (AEO) 2019: Oil and Gas Supply Module.

For the onshore low scenario, the authors use a very conservative assumption that only one well will be drilled per parcel. On BLM managed lands, a lease is terminated if a lessee fails to produce oil and gas within 10 years. As such, assuming that any individual lease parcel will contain a minimum of one well is a fairly conservative assumption.

Consistent with AEO 2019 High Oil and Gas Resource and Technology case, for the onshore high scenario the authors adjust resource assumptions using 50% higher EUR per well than the reference case to simulate more domestic crude oil production.

In addition to the OGSM, for offshore, researchers use the production levels for the low, middle, and high oil price and technology scenarios used by BOEM for the 2017–2022 Program and 2012–2017 Program cases as derived from exploration and development (E&D) scenarios prepared by BOEM for Programmatic EIS documents.

This analysis covers the three major greenhouse gases associated with oil and gas systems: carbon dioxide, methane, and nitrous oxide. A highly potent greenhouse gas, methane emissions cause around 1/4th of the impacts of a changing climate that we are currently experiencing today.

The authors use standard EPA assumptions regarding methane leakage rates from the oil and gas system. However, it is important to note that a number of studies have found that EPA (using industry self-reported emission rates) largely underestimates methane leakage, particularly for major oil fields such as those that overlay large swaths of public lands in the West.

Emissions are reported in units of carbon dioxide equivalent (CO_{2e}) using global warming potentials (GWP). The Wilderness Society uses a GWP of 25 for methane from the IPCC Fourth Assessment Report (2007) based upon a 100-year time horizon in order to be consistent with the standard method used by the US government and to easily compare the range of foreseeable emissions resulting from these leases to other regional and federal emission estimates. Methane only lasts for about 13 years in the atmosphere, but the damage it causes is about 86 times greater than CO₂ when reporting over a shorter time period. These damages are irreversible, and The Wilderness Society promotes use of a 10-20-year time horizon to inform near-term actions regarding activities dealing with potent short-lived climate pollutants such as methane.

To estimate direct climate impacts from particular lease sales, the authors use per well emission factors for a representative horizontal oil and gas well in a region employed by BLM regional or field offices for RMP and EIS documents or based on estimates used in major research reports such as the Kleinfelder Report done for BLM in 2013. To simplify, the authors use direct emission factors from a “typical” horizontal oil and gas well for an onshore region. Presenting direct horizontal oil and gas wells emissions estimates represent a more conservative summary of emissions when compared to emissions from a vertical well.