



Building a Legacy

The Biden Administration's
Climate Action on Public Lands

April 2024

Executive Summary

The Biden administration has prioritized tackling climate change with historic measures to reduce United States (US) consumption of fossil fuels through actions such as the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA). These two pieces of legislation mark the largest investment in climate action in US—and arguably world—history. To help maximize and speed up US and global emission reductions, in parallel with demand-side actions that directly reduce the amount of fossil fuels consumed, the environmental community has pushed for federal actions to manage public lands in ways that help tackle the climate crisis. The administration has repeatedly acknowledged that management of public lands should be part of the climate solution. Now, in the administration's fourth year in office, this report takes stock of the potential impact of the administration's work on projected greenhouse gas (GHG) emissions stemming from federal public lands.¹ Here is what we find:

Reduction of future federal fossil fuels in the Lower 48:

Over 99% of federal onshore fossil fuels managed by the US Department of the Interior (DOI) Bureau of Land Management (BLM) come from the Lower 48 states. The estimated impact of actions on fossil fuel policy taken and pursued over the past three plus years could result in a combined 40% reduction in lifecycle emissions from BLM-managed coal, oil and gas in the Lower 48.² That's around 390 million metric tons of carbon dioxide equivalent per year (MMT CO₂e). To put the number in perspective, that's equivalent to the emissions coming from all US passenger cars in 2021.³ The actions leading to this result include: reducing demand for fossil fuels by shifting the energy landscape to renewables via investments in the IRA; reducing new oil and gas leasing by over 90% and using planning efforts to limit areas available for development more securely over the long term; and modernizing fiscal terms for oil and gas leases.

Limited areas available for fossil fuel development in the Arctic:

By significantly reducing the land available for oil and gas production, the current management plans for the Arctic significantly reduce the worst-case scenario of future emissions from drilling in the Arctic. These plans could mean at least a 65-75% reduction for the Arctic Refuge and a 50% reduction for the Western Arctic below prior plans focused on maximizing extraction (around -9 MMT CO₂e/year and -6 MMT CO₂e/year, respectively).⁴ This would result in significant additional avoided carbon emissions on top of those calculated in the section above.

Boosted responsibly sited renewables:

With around 10 GW operating, 37 projects representing 7.3 GW approved since 2021, and 66 projects in the review pipeline representing over 32 GW of clean energy – with 193 more at the application stage – BLM announced on April 11, 2024, that they had surpassed the statutory goal of permitting 25 GW of renewable energy on public lands by 2025.⁵ Along with the incentives and regulations in BLM's Renewable Energy Rule, the administration's BLM Draft Solar Programmatic Environmental Impact Statement (PEIS) plan paves the way for coordinated solar application areas to boost utility-scale renewable energy on federal lands across 11 states in locations with fewer environmental and community conflicts. The solar projects resulting from the plan could avoid or displace up to 123 MMT CO₂e per year of fossil fuel emissions by 2045—the equivalent to the emissions from 32 coal-fired power plants every year.^{6, 7}

The estimated impact of actions on fossil fuel policy taken and pursued over the past three plus years could result in a combined 40% reduction in lifecycle emissions from BLM-managed coal, oil and gas in the Lower 48.

Conserved carbon stored in old-growth forests:

Protecting old-growth and mature forests provides important carbon storage benefits. Over 60% of all forested lands managed by DOI and the US Department of Agriculture (USDA) are either old-growth or mature forests.⁸ The administration has prioritized conserving and restoring old-growth and mature forests on National Forest System Lands as part of the US climate strategy.

Altogether, the administration's record on utilizing public lands to help tackle climate change is strong. It is pulling the right levers, but the world needs the federal government to do more to reduce the supply of fossil fuels and at a faster pace.⁹ Most urgently, the administration must continue to finalize the suite of rulemakings—BLM's Renewable Energy, Public Lands, Oil and Gas, and Western Arctic Rules—to update their management of public lands and ensure that these lands are a part of the climate solution. Future administrations should further align their oil and gas policies with national climate commitments and climate impacts to public land resources by factoring lifecycle emissions from production into decision-making for our public lands.

Table of Contents

- 03** **Reducing Emissions Stemming from Federal Onshore Fossil Fuels**
- 07** **Boosting Renewables**
- 08** **Protecting Natural Carbon Storage**
- 09** **The US Federal Government Can Do More to Use Legal Authority to Curb Lifecycle Emissions from Public Lands**
- 10** **Appendix**
- 11** **Endnotes**

Reducing Emissions Stemming from Federal Onshore Fossil Fuels

Despite the sizeable contribution of greenhouse gas emissions stemming from fossil fuels produced on federal lands, historically the federal government neglected to track, project and report on these emissions on an annual basis.¹⁰ This changed under the Biden administration (Box 1).

PROGRESS:

For the first time in history, the administration has measured, projected, reported and updated a public annual assessment of lifecycle emissions of federal lands each year.

We cannot address what we do not measure. Transparent and frequent reporting of historic and projected trends from federally managed lands is critical for developing US climate and energy policy given the many aspects of federal mineral leasing and production that can be regulated directly by the Department of the Interior. In response to Executive Order 14008¹¹ calling on federal agencies to “drive assessment, disclosure, and mitigation of climate pollution” in every sector of the US economy, BLM has published a report each fall since 2021 with the estimated emissions attributable to coal, oil and gas development that is occurring and is projected to occur on federal lands.¹² Collectively referred to as BLM’s GHG Specialist Report, these reports aim to meet the assessment and disclosure goals of E.O. 14008.¹³

Box 1. *Following Executive Order 14008, the Biden administration began annually measuring, projecting, reporting and updating a public annual assessment of lifecycle emissions of federal lands.*

In 2022, around 43% of US coal, 13% of US oil and 9% of US gas production came from the onshore federal mineral estate.¹⁴ Lifecycle emissions of federal onshore oil, gas and coal represent around 15% of US-wide annual emissions since 2015.¹⁵ To examine the potential climate impact of the current administration’s management of federal onshore fossil fuels, we first focus on what actions could mean for Lower 48 federal onshore oil, gas and coal (where over 99% of historic federal onshore fossil fuel production comes from). Then we turn to future production potential in the Arctic and discuss potential impacts of actions taken or pursued currently compared to what oil and gas development could be if policy goals shifted in the Arctic.

Despite the sizeable contribution of greenhouse gas emissions stemming from fossil fuels produced on federal lands, historically the federal government neglected to track, project and report on these emissions on an annual basis. This changed under the Biden administration.

Reducing Emissions from Oil, Gas and Coal in the Lower 48

For the Lower 48, the combined estimated impact of actions taken and pursued over the last three years discussed below could represent around a 40% reduction in lifecycle emissions from Lower 48 BLM-managed coal, oil and gas (Figure 1).¹⁶

Decreasing demand for federal fossil fuels

The current administration fought for and passed the IRA in August 2022, establishing robust government support for renewable energy, electric vehicles and advanced technologies to combat climate change. The large investments

in and incentives for electrification and expansion of low-carbon generation included in the IRA will hasten the shift away from fossil fuels by decreasing demand for them. This could mean over a 20% decline in lifecycle emissions from federal coal (around -76 MMT CO₂e/year) and a 3% decline for lifecycle emissions from federal onshore oil and gas (around -18 MMT CO₂e/year).¹⁷

Decreasing oil and gas leasing by over 90%

In early 2021, the administration paused issuing new oil and gas leases from the federal mineral estate.¹⁸ DOI won a victory in a leasing pause case in Wyoming federal district court, upholding Interior's considerable discretion over the oil and gas leasing program.¹⁹ Another district court

Admin actions could represent around a 40% reduction in lifecycle emissions from Lower 48 federal onshore oil, gas and coal

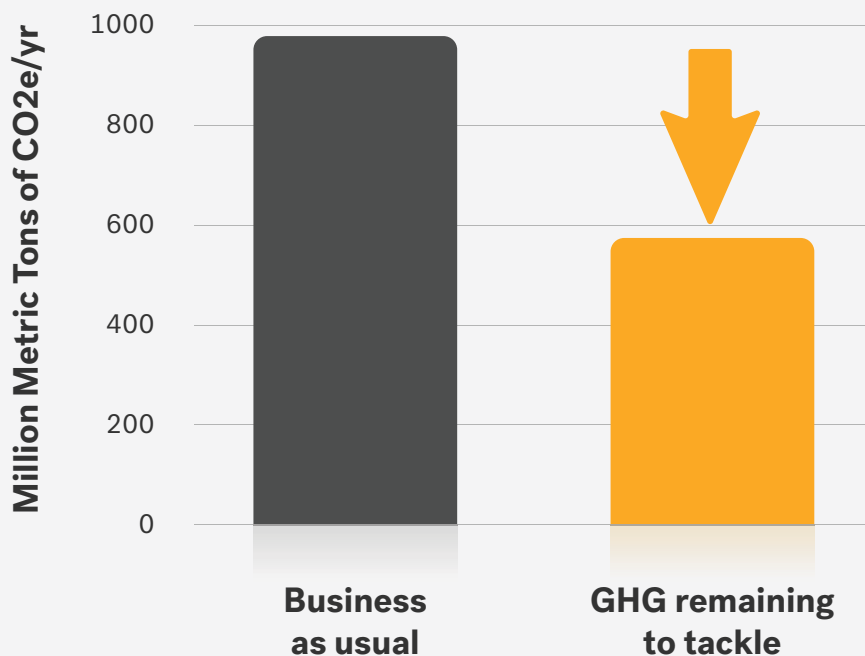


Figure 1. The combined estimated impact of actions taken and pursued under the Biden administration could represent around a 40% reduction in lifecycle emissions from Lower 48 BLM-managed coal, oil and gas.

in Louisiana²⁰ ruled differently, however, and the administration resumed leasing. Since then, using its discretion, starting in June 2022 DOI has dramatically reduced the amount of acreage offered for sale: BLM has reduced the amount of acreage offered each year in onshore oil and gas lease sales by 96% below the amounts offered under the previous administration each year between January 2017 and January 2021.²¹ In addition to significantly reducing the amount of acreage offered in lease sales in the Lower

48, the average acreage sold each year under the current administration is well below the five previous four-year periods and 91% lower than the previous administration²² (see Figures 2a and 2b). Reductions in acres offered and sold have continued while the Interior Department has met its legal obligations regarding leasing under the “tethering” provisions of the IRA, which require that BLM offer some acreage for leasing in order to process renewable energy permits on public lands.

Average acres sold for oil and gas on BLM-managed lands per year in the Lower 48

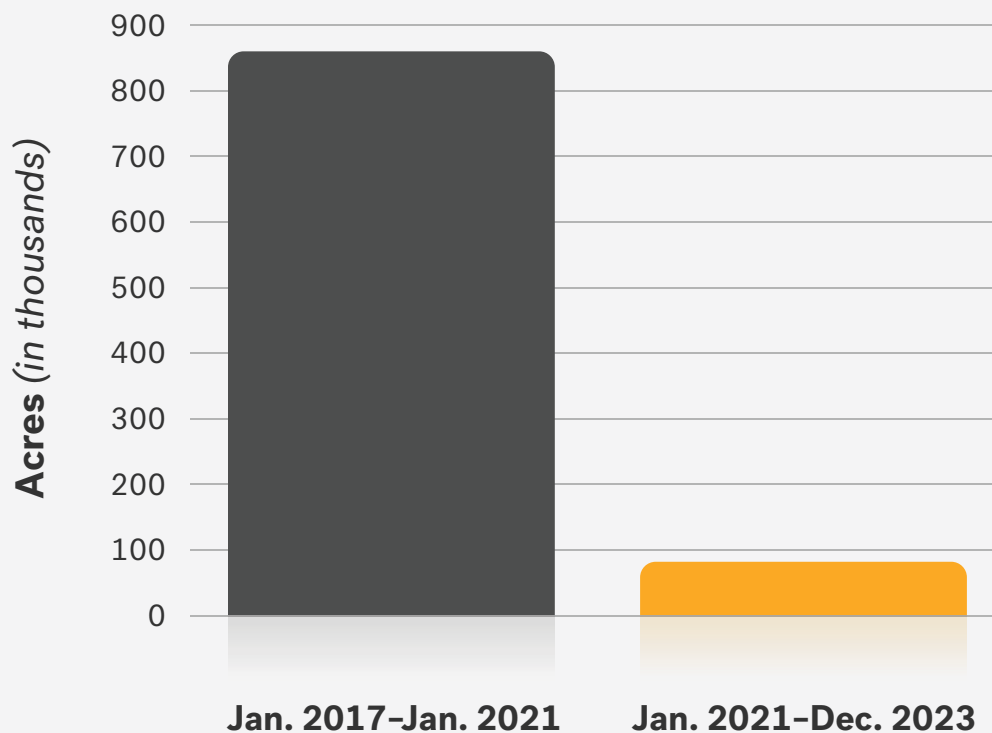


Figure 2a. Comparing annual average Lower 48 acres sold under the previous administration (Jan. 20, 2017–Jan. 21, 2021) and the current administration (Jan. 22, 2021–Dec. 31, 2023).²³

Average annual acres sold for oil and gas on BLM-managed lands in Lower 48

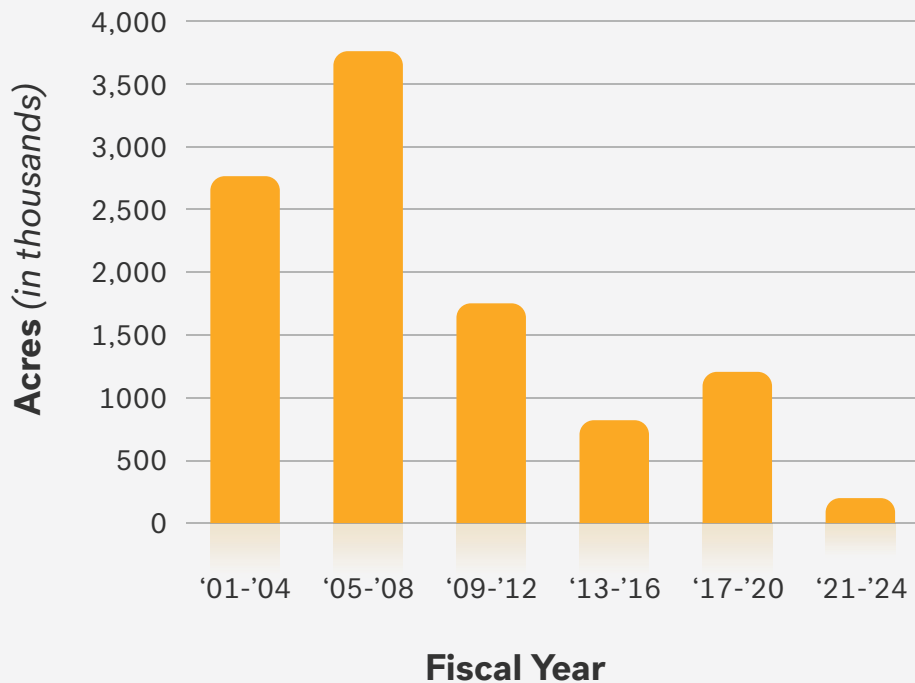


Figure 2b. Comparing average oil and gas acreage sold in the Lower 48 since fiscal year (FY) 2001.²⁴ On average per fiscal year, the federal government sold around: 2.8 million acres between FY2001-FY2004; 3.8 million acres between FY2005-FY2008; 1.7 million acres between FY2009-FY2012; 814 thousand acres between FY2013-FY2016; 1.2 million acres between FY2017-FY2020; and 153 thousand acres between FY2021-FY2023.

Reducing the number of acres leased for new oil and gas development matters for climate. Fewer acres leased means fewer acres that eventually get drilled. And less drilling means fewer emissions stemming from public lands. If the federal government were to continue the pre-Biden administration leasing approach out to 2050, most of the oil and gas emissions from that period (over 75%) could come from new leases.²⁵ In contrast, sustaining the current administration’s approach of limiting new oil and gas leasing could help further reduce lifecycle emissions from Lower 48 federal fossil fuels by around 280 MMT CO₂e per year.²⁶

Even if future leasing ramps back up to pre-Biden administration levels, the significant reduction in new acreage sold between 2021 and 2024 will likely continue to impact the levels of lifecycle emissions from BLM-managed lands for many years because the bulk of production from onshore oil and gas leases typically does not come online until 10 years after a lease sale.²⁷ In other words, a lot of the production from leases sold in 2023 will not come online until after 2032 when global demand for oil and gas should also be declining, especially if global emissions are on a trajectory to reach net zero by 2050.

Limiting areas available for fossil fuel development

The current administration has fought to limit areas available for fossil fuel development in important cultural sites, wildlife areas and on land with low oil and gas development potential. These actions benefit conservation and cultural preservation.

BLM is also making strides at the land use planning stage. Resource management plan (RMP) revisions and amendments for landscapes in the Lower 48 have the potential to reduce annual lifecycle emissions by around 12 MMT CO₂e per year below business-as-usual scenarios (see Table 1). Given how long it typically takes to modify an RMP, removing areas available from even being considered for lease sale nominations via the planning process makes conservation and climate gains more durable.

Potential lifecycle emissions reductions from BLM lands under final or pending Biden administration decisions compared to continuing previous management actions		
	Metric tons CO₂e per year	Status or timing of expected completion
Greater Chaco Region mineral withdrawal ²⁸	337,000	Finalized June 2023
Eastern Colorado RMP ²⁹	56,000	Finalized January 2024
Rock Springs RMP ³⁰	8,269,000	Final expected in spring 2024
Colorado River Valley and Grand Junction RMP ³¹	2,042,000	2024
Thompson Divide mineral withdrawal ³²	260,000	Finalized April 2024
Colorado Big Game Corridor RMP Amendment ³³	680,000	2024
Uncompahgre RMP ³⁴	582,000	2025
Total of selected plans	11,889,000	

Table 1. Plans finalized or in-progress under the Biden administration’s first term could reduce annual emissions stemming from BLM areas by around 12 MMT CO₂e per year.

Modernizing fiscal terms for oil and gas leases

The administration has increased fees to make oil and gas development on public lands more fiscally responsible by charging rates more in-line with those applied to development on state lands. Passage of the IRA in 2022 included many of the royalty and additional fee provisions broadly recommended by DOI in a November 2021 report.³⁵ On April 12, 2024, BLM released its final Oil and Gas Rule to update the federal oil and gas program, including with the provisions from the IRA. The rule also codified higher

fiscal terms for new and reinstated oil and gas leases. These terms, namely a higher royalty rate, could reduce emissions stemming from the Lower 48 federal mineral estate on the scale of around 10 MMT CO₂e on average per year when combined with the other actions in this section of the report (and as much as 15 to 25 MMT CO₂e reduction per year on average when analyzed in isolation).³⁶

To help tackle upstream methane emissions from BLM-managed lands, BLM released a Final Methane Waste Prevention Rule in March 2024.³⁷

Reducing Emissions from Oil and Gas in the Arctic

Arctic Refuge

The administration has been addressing the serious legal deficiencies with the previous administration's environmental analysis of a statutorily mandated leasing program on the coastal plain of the Arctic National Wildlife Refuge (the Arctic Refuge), the January 2021 lease sale plan, and the issuance of leases. In 2021, BLM suspended the oil and gas leases issued in the Arctic Refuge pending a review of the program's environmental impact. In 2023, the administration canceled the remaining, unlawfully issued leases and issued a draft supplemental environmental analysis for the coastal plain leasing program. The proposed new analysis for the congressionally mandated leasing program plan could result in placing necessary and strong conservation guardrails on the second lease sale that BLM is still legally required to hold in the Arctic Refuge before the end of 2024 because of the 2017 Tax Cuts and Jobs Act.³⁸ If any leases are issued as part of the sale, the conservation alternative analyzed by DOI could reduce total lifecycle emissions over the life of any future leases by around 75% below the prior administration's leasing plan.³⁹

Production levels in the coastal plain are highly speculative in large part due to huge uncertainties in the resource potential.⁴⁰ However, these estimates help to show the relative potential lifecycle emissions of the conservation alternative compared to what lifecycle emissions could

be under an unconstrained leasing program in the Arctic Refuge similar to the previous, flawed plan (and the highly unlikely market conditions that could make exploration and development feasible).⁴¹ In reality, few companies could foot the bill needed for exploration, both monetarily and in terms of cost to their reputation. As of August 2023, 29 global financial institutions (including all major American and Canadian banks) and many insurers had pledged not to finance or insure oil and gas projects in the Arctic.⁴² Bank of America later amended its policy and stated that future development proposals would be subjected to greater scrutiny by the bank.⁴³

Western Arctic

In 2022, the administration scrapped the 2020 Integrated Activity Plan (IAP) for the Western Arctic in Alaska that had opened much of the region to oil and gas development under the previous administration.⁴⁴ BLM returned management to the 2013 IAP, which reduced land available for new oil and gas leasing by about 37% and reduced potential lifecycle emissions that could occur by almost 50% compared to potential emissions under the 2020 IAP.⁴⁵

In September 2023, BLM proposed a new rule expanding protections for designated Special Areas and surface resources in the Western Arctic. This proposed rule could further reduce future development and resulting emissions in the area, stemming the tide of oil and gas expansion and halting substantial adverse impacts to this globally significant region and its climate.⁴⁶

Boosting Renewables

For the US to meet its critical climate goals while achieving a stable, fair and carbon-free energy economy, between 3,000 to 5,800 GW of renewable generating capacity must be added by 2050.⁴⁷ To put the scale of the buildout needed into perspective, as of fall 2023, the US had a combined 276 GW of solar, wind and geothermal in operation (including around 8 GW operating on public lands and waters).^{48, 49}

The administration's progress to ramp up responsible renewable energy projects on public lands is evident. By April 2024, the current administration's BLM had approved 37 projects representing 7.3 GW and had an additional 32 GW from 66 clean energy projects in the review pipeline.⁵⁰ Because of this work, BLM has already surpassed the Energy Act of 2020 goal of permitting 25 GW of renewable energy on public lands by 2025, a goal that's also a tenet of the current administration's strategy to achieving 100% carbon-free electricity nationwide.

In January 2024, the administration released its proposed BLM Draft Solar Programmatic Environmental Impact Statement (PEIS) to update and expand the 2012 Western Solar Plan to incorporate an additional five states.⁵¹ The Solar PEIS will provide planning consistency across BLM-administered lands in 11 western states (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming).⁵² The administration's plan paves the way for smart, utility-scale solar generation on federal lands in locations with fewer environmental and community conflicts, and establishes mandatory mitigation measures designed to avoid, minimize and offset adverse project impacts. The plan identifies low-conflict areas for development by using a set of resource-based criteria to screen public lands and exclude critical habitat, lands with wilderness characteristics, National Conservation Lands and other sensitive areas. BLM is also focusing on solar development near existing and planned transmission infrastructure.

BLM's Draft Solar PEIS projects that solar development and operation on BLM-administered lands over the 11-state planning area could reach 93 GW of generating capacity by around 2045 and the solar projects resulting from the Biden administration's plan could avoid or displace up to 123 MMT CO₂e per year of fossil fuel emissions by 2045.⁵³

To put the potential avoided annual fossil emissions into perspective, BLM notes that 123 MMT CO₂e represents around half of the 2021 GHG emissions from the electric power sector in those 11 states.⁵⁴

In parallel to the updated and expanded Western Solar Plan, BLM has worked in other ways to promote responsible wind and solar development across BLM lands. In 2022, pursuant to the Energy Act of 2020, BLM issued guidance to reduce fees for renewable energy projects and announced the creation of five new Renewable Energy Coordinating Offices to help facilitate the application and permitting process.⁵⁵ On April 11, 2024 the agency also finalized new right-of-way regulations, known as the Renewable Energy Rule, that aim to promote and streamline renewable energy development on those BLM lands that the Western Solar Plan, and a similar plan for wind completed in 2005, identifies as appropriate for such development.⁵⁶ The rule will encourage solar and wind development by reducing capacity fees for all wind and solar projects by up to 80% through 2035, by 60% starting in 2036, by 40% in 2037, and by 20% in 2038 and beyond. The rule also provides BLM with the flexibility to accept non-competitive lease applications inside designated leasing areas.

Protecting Natural Carbon Storage

Protecting old-growth and mature forests provides important carbon storage benefits to help meet US climate goals. In 2022, a historic Executive Order declared protection of old-growth forests to be official policy of the United States and requiring steps for federal agencies to protect old-growth.⁵⁷ In line with the Executive Order, USDA Forest Service has taken numerous steps to conserve and restore old-growth forests on National Forest System Lands as part of US climate strategy including, but not limited to, the following:

- Finalized the administration's Alaska Roadless Rule, repealing the previous administration's 2020 rule, and restoring longstanding protections to 9.37 million acres of the Tongass National Forest.⁵⁸

- Premiered a first-ever inventory of mature and old-growth forests across federal lands.⁵⁹ The report found that over 60% of all forested lands managed by DOI and USDA are either old-growth or mature forests.⁶⁰
- Proposed a first-ever nationwide forest plan amendment to provide consistent direction on how to conserve and restore old-growth forests across National Forest System Lands by amending all 128 forest land management plans collectively in one amendment.⁶¹
- Initiated the process to update the Northwest Forest Plan that will affect an area that contains an estimated one-fourth of the US Lower 48 national forest system's remaining old-growth.⁶²

The US Federal Government Can Do More to Use Legal Authority to Curb Lifecycle Emissions from Public Lands

Altogether, the administration's record on utilizing public lands to help tackle climate change is strong, but the world needs the federal government to do more to reduce fossil fuels and at a faster pace. As the #1 oil, #1 gas and #4 coal producer in the world, the US is a big contributor to the ongoing misalignment between planned fossil fuel production and global production levels consistent with limiting global warming to 1.5°C or 2°C.⁶³

In addition to conservation benefits, research shows that actions to reduce production of fossil fuels, in tandem with demand-side actions like fuel economy standards and electric vehicle incentives, will help the US more effectively address climate change.⁶⁴ Any actions that reduce fossil fuel production on US federal lands will reduce the amount available in the global market, which would result in both lower domestic consumption and less exported and consumed abroad.⁶⁵ Pursuing concurrent and coordinated demand-side and supply-side actions leads to more efficient, and maximum, GHG emissions reductions. Emissions leakage that partially undermines the climate benefit of actions occurs with both demand-side and supply-side policies if a jurisdiction, such as the US, pursues only one type of policy in isolation.⁶⁶ Only when pursuing both demand- and supply-side actions at the same time and with equal ambition can we eliminate leakage, mitigating impacts on energy prices and maximizing emission reductions.⁶⁷

The federal government has additional authorities it can exercise to limit lifecycle emissions from fossil fuel production from federal lands using supply-side actions. For more than a century, BLM has considered numerous factors—including climate—in carrying out its mission. The lands and resources BLM manages are already experiencing and

will continue to bear significant harmful consequences from a warming climate.⁶⁸ These impacts can be mitigated, to some degree, by holding warming as low as possible. BLM can use its legal authority to include lifecycle climate impacts among the factors it considers when making leasing and permitting decisions. The Mineral Leasing Act of 1920, the Federal Land Policy and Management Act and the Naval Petroleum Reserves Production Act give BLM broad legal authority to adopt regulations on how publicly owned resources like oil and gas will be administered. BLM's responsibility to protect public lands and natural resources, and its broader obligation to protect the public welfare and national interest, require consideration of climate change.

The administration could use its authority to mitigate the adverse impacts of climate change on public lands by aligning its oil, gas and coal planning, leasing and permitting decisions with climate science and national climate commitments by factoring lifecycle GHG emissions and related public lands climate impacts into its fossil fuel decisions. Most urgently, the administration must continue to finalize the suite of rulemakings—that includes BLM's Renewable Energy, Public Lands, Oil and Gas, and Western Arctic Rules—to update their management of public lands and ensure that these lands are a part of the climate solution. Together, these rules lay the groundwork to further reduce and avoid emissions on public lands and make way for even more emissions reducing actions in the future.

Appendix

Methods and assumptions for the estimated combined impacts of actions on Lower 48 federal fossil fuel lifecycle emissions

For baseline emissions for federal coal, oil and gas we use the 2022 BLM GHG Specialist Report's "No Inflation Reduction Act" (IRA) case based on US EIA's Annual Energy Outlook (AEO) 2023 projections.⁶⁹ Although the BLM report includes Alaska, the projections assume a continuation of historic low development on federal lands in Alaska out to 2050 and therefore, we refer to this scenario as our Lower 48 baseline.

To first account for the reduction in demand for fossil fuels coming from federal lands due to increased clean energy investments in the IRA, we calculate the annual difference by fuel-type between the Lower 48 baseline and the 2022 BLM GHG Specialist Report's "Reference Case" scenario that includes the IRA.

Second, we estimate the impact of sustaining a reduction in new oil and gas acreage sold that has economic production potential. We apply the percent production by onshore federal well type from Prest 2021 supplemental results to estimate the portion of remaining baseline oil and gas emissions expected to come from new wells on new leases. For this exercise, we assume that the average amount of acreage sold each year between January 2017 and January 21, 2021 represents the business-as-usual acreage amount that results in the portion of baseline emissions from new wells on new leases. Our analysis of BLM lease sale data shows that the average acreage sold each year under the current administration represents a 91% reduction below the previous administration. (The previous administration sold 856,252 BLM-managed acres for oil and gas development in the Lower 48 on average each year between January 2017 and January 21, 2021. In contrast, the current administration sold an average of 77,544 acres per year between January 22, 2021, and December 31, 2023.) We account for the fact that in the Lower 48 baseline only a little over half of the business-as-usual acreage sold (54% or 461,632) would go on to produce at economic quantities.⁷⁰ Given the BLM Oil and Gas Rule will further discourage BLM from offering acres with low development potential, we conservatively assume for our actions scenario that any new acreage sold going

forward would be in areas that will go on to be developed. Combining these assumptions, continuing the current administration's level of new acreage each year could represent around an 83% reduction in acreage sold that has oil and gas potential compared to business-as-usual.⁷¹ For the action scenario's lifecycle emissions coming from new oil and gas leases we assume an 83% decline each year compared to the remaining new oil and gas leases portion of the Lower 48 baseline. To further avoid double counting we assume that the reduced emissions due to Lower 48 planning processes are already part of this reduction.

Third, we estimate the additional impact of new fiscal terms included in the BLM Oil and Gas Rule on reducing the remaining Lower 48 baseline oil and gas emissions from all wells. We apply the by-year % decline in onshore federal oil and gas emissions due to an 18.75% royalty rate from Prest 2021 supplemental results as a reasonable proxy for the combined impacts of the non-methane increased fees included in the BLM Oil and Gas Rule. Although an increase to 18.75% assumed in Prest 2021 is higher than the 16.67% royalty rate included in the BLM Oil and Gas Rule, the 16.67% royalty rate is also applied to reinstated leases (not just new leases as assumed in Prest 2021) and the rate can be further increased after 2031. In addition, although not expected to have substantial impacts on oil and gas companies' decisions to develop when examined in isolation, collectively the additional fiscal rate increases and changes included in the IRA and the BLM Oil and Gas Rule will further drive up the costs of doing business. As result, applying the by-year percent decline from the Prest 2021 modeling of the impact of increasing the onshore royalty rate to 18.75% is a reasonable proxy for the potential impact of the fiscal terms and additional requirements included in the BLM Oil and Gas Rule.

Endnotes

- 1 The emissions discussed in this report are lifecycle GHG emissions from upstream, midstream and downstream (final use regardless of where combusted) coming from coal, oil and gas from the onshore federal mineral estate managed by the Department of the Interior's Bureau of Land Management. Unless otherwise noted, emissions in this report refer to average lifecycle emissions per year. These estimated emissions impacts of actions are not to be interpreted as the impacts on US-wide emissions.
- 2 See Appendix 1 for methods and assumptions for this calculation.
- 3 US Environmental Protection Agency (EPA). 2023. Fast Facts: U.S. Transportation Sector Greenhouse Gas Emissions. 1990-2021. (June 2023). At 2. <https://www.epa.gov/system/files/documents/2023-06/42of23016.pdf>
- 4 For the Arctic Refuge, see US BLM Coastal Plain Oil and Gas Leasing Program Draft Supplemental Environmental Impact Statement. Vol. 3. Appendix Q. Air Resources Technical Support Document. (August 2023). https://eplanning.blm.gov/public_projects/2015144/200492847/20085217/250091399/Coastal_Plain_Draft_SEIS_Vol3_508.pdf [hereinafter BLM Coastal Plain Vol.3. 2023] Estimated total gross lifecycle emissions of life of leases under Alt. B is around 909 MMT CO_{2e} (140.3 MMT CO_{2e} midstream in Table 2-2; 14.8 MMT CO_{2e} midstream in Table 2-6; 754 MMT CO_{2e} downstream in Table 2-9) and under Alt. D (the conservation alternative) is around 223 MMT CO_{2e}. Alt D. (33.9 MMT CO_{2e} midstream in Table 2-4; 3.6 MMT CO_{2e} midstream in Table 2-8; 185.7 MMT CO_{2e} downstream in Table 2-11). Compared to Alt. B, analysis of the BLM's estimates indicates that pursuing Alt. D could have around 686 MMT CO_{2e} lower lifecycle gross emissions stemming from potential production over 50-70 years, representing a 75% decline below Alt. B. Dividing the total gross emissions for each Alternative by BLM's assumed 51-years for Alt. D and 69-years for Alt. B, we estimate around a 9 MMT CO_{2e}/year difference (a 67% decline) between pursuing Alt. D and Alt. B. [See U.S. BLM Coastal Plain Oil and Gas Leasing Program Draft Supplemental Environmental Impact Statement. Vol. 1. August 2023. https://eplanning.blm.gov/public_projects/2015144/200492847/20085216/250091398/Coastal_Plain_Draft_SEIS_Vol1_508.pdf] As noted in Vol 1. at ES-4: Alternative B mirrors the preferred alternative from the 2019 Coastal Plain Oil and Gas Leasing Program Environmental Impact Statement and the 2020 Record of Decision. Alternative B offers the opportunity to lease the entire program area and includes the fewest acres with no surface occupancy stipulations. Alt. D includes a new suite of lease stipulations and ROPs.

For Western Arctic, [See US BLM. NPR-A Integrated Activity Plan and Environmental Impact Statement. Volume 1. At 96. Table 3-2 https://eplanning.blm.gov/public_projects/117408/200284263/20020342/250026546/Volume%201-ExecSummary_Ch1-3_References_Glossary.pdf] The alternative that the Biden admin chose in 2022 (Alt A) represents around 50% lower potential lifecycle emissions (-445 MMT CO_{2e} total or around -6.3 MMT CO_{2e} per year over 70 years) compared to under the alternative that the Trump admin. chose in 2020 for the NPR-A IAP (Alt. E). Estimates from Table 3-2 for the high-end potential production over 70 years. (49% = (463.517 MMT CO_{2e} - 908.856 MMT CO_{2e})/908.856 MMT CO_{2e})

- 5 BLM. Biden-Harris Administration delivers historic milestones, new actions for clean energy on public lands (April 11, 2024). <https://www.blm.gov/press-release/biden-harris-administration-delivers-historic-milestones-new-actions-clean-energy>

And

BLM. Renewable Energy Projects Approved (as of April 1, 2024). <https://www.blm.gov/programs/energy-and-minerals/renewable-energy/active-renewable-projects#Approved>.

As of April 1, 2024, BLM posted that they had 66 projects representing 32 GW of clean energy under review. 37 of these projects are at the NEPA or pre-NEPA stage of review. 33 of these projects are solar, wind, or geothermal, representing a combined 18,069 MW of renewable energy (16,275 solar, 1,600 MW wind, and 194 MW geothermal). In addition, BLM has 1,357 MW of Gen-Tie projects at the NEPA or pre-NEPA stages of review.

- 6 BLM. Draft Programmatic Environmental Impact Statement for Utility-Scale Solar Energy Development. Vol. 1. January 2024. At p. 5-86 and ES-23. Document #DOI-BLM-HQ-3000-2023-0001-RMP-EIS https://eplanning.blm.gov/public_projects/2022371/200538533/20102762/251002762/2023%20Draft%20Solar%20PEIS%20Volume%201%201-10-2024_508compliant.pdf
- 7 U.S. Environmental Protection Agency (EPA) GHG Equivalencies Calculator. Accessed on 12 March 2024. <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results> [hereinafter EPA GHG Calculator]
- 8 US Department of Agriculture and US Department of the Interior. April 2023.
 “Mature and Old-Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management.” FS-1215a
<https://www.fs.usda.gov/sites/default/files/mature-and-old-growth-forests-tech.pdf>
- 9 SEI, Climate Analytics, E3G, IISD, and UNEP. (2023). The Production Gap: Phasing down or phasing up? Top fossil fuel producers plan even more extraction despite climate promises. Stockholm Environment Institute, Climate Analytics, E3G, International Institute for Sustainable Development and United Nations Environment Programme. At p.48 <https://doi.org/10.51414/sei2023.050>
- 10 In 2018 the United States Geological Survey published a retrospective report that found lifecycle emissions from coal, oil and natural gas produced on federal lands and waters accounted for 1,279 MMTCO_{2e}, 22.4% of US energy emissions, in 2014, the last year covered in their work. The USGS report was meant to establish a methodology for subsequent analysis; however, that annually updated database of historic lifecycle emissions for federal lands and waters has not materialized as of March 2024. See Merrill et al (2018) Federal Lands Greenhouse Emissions and Sequestration in the United States — Estimates for 2005–14: US Geological Survey Scientific Investigations Report 2018–5131. <https://doi.org/10.3133/sir20185131>
- 11 Executive Order 14008: Tackling the Climate Crisis at Home and Abroad. Issued January 27, 2021. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad>
 Specifically, EO 14008 states: “Federal Government must drive assessment, disclosure, and mitigation of climate pollution and climate-related risks in every sector of our economy, marshaling the creativity, courage, and capital necessary to make our Nation resilient in the face of this threat.”
- 12 US BLM. “2020 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends: from Coal, Oil, and Gas Exploration and Development on the Federal Mineral Estate.” (Nov. 2021). <https://www.blm.gov/sites/default/files/docs/2021-11/2020%20BLM%20Specialist%20Report%20-%20GHG%20Emissions%20and%20Climate%20Trends%20%2811-3-21%29.pdf>
 US BLM. “2021 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends: from Coal, Oil, and Gas Exploration and Development on the Federal Mineral Estate.” (released in fall 2022). <https://www.blm.gov/content/ghg/2021/#fed>
 US BLM. “2022 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends: from Coal, Oil, and Gas Exploration and Development on the Federal Mineral Estate.” (released in fall 2023). <https://www.blm.gov/content/ghg/2022/#fed> [hereinafter 2022 BLM Specialist 2023]
- 13 BLM. Fact Sheet. “Analyzing the effects of fossil fuel leasing and development on greenhouse gases.” <https://www.blm.gov/sites/blm.gov/files/docs/2021-10/Fact%20Sheet%20GHG%20Emissions%20Report%2010292021.pdf>

- 14 Analysis of 2022 US-wide production data from U.S. Energy Information Administration (EIA) and federal onshore production data from Office of Natural Resources Revenue (ONRR) Data.
- U.S. EIA. Monthly Energy Review. At Table 1.2 Primary Energy Production by Source. Released on 25 May 2023.
- U.S. DOI. Office of Natural Resources Revenue Data. (ONRR). Calendar year production 2003-2022. https://revenue.data.doi.gov/downloads/calendar_year_production.csv
- 15 Lifecycle emissions of federal fuels from TWS' FLEAT 2023 with methods published in Ratledge, N., Zachary, L., and Huntley, C. Emissions from fossil fuels produced on US federal lands and waters present opportunities for climate mitigation. Climatic Change 171, 11 (14 March 2022) <https://doi.org/10.1007/s10584-021-03302-x>
- Comparison to US-wide total CO_{2e} emissions excluding land use from US Environmental Protection Agency (EPA) Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2021. at Table 2-3. (2023)
- 16 See Appendix 1 for methods and assumptions.
- 17 See Appendix 1.
- 18 On January 27, 2021, President Biden signed Section 208 of Executive Order (E.O.) 14008, which directed a pause on issuing new federal oil and gas leases until a comprehensive review was complete. Presidential Executive Order 14008, 86 Fed. Reg. 7,619 (Feb. 1, 2021) (directing the Secretary of the Interior to “pause new oil and natural gas leases on public lands or in offshore waters pending completion of a comprehensive review and reconsideration of Federal oil and gas permitting and leasing practices in light of the Secretary of the Interior’s broad stewardship responsibilities over the public lands and in offshore waters”).
- 19 W. Energy All. v. Biden, No. 21-CV-13-SWS, 2022 U.S. Dist. LEXIS 171160 (D. Wyo. Sep. 2, 2022).
- 20 Louisiana v. Biden, 543 F. Supp. 3d 388 (W.D. La. 2021), rev'd, 45 F.4th 841 (5th Cir. 2022).
- 21 Analysis of BLM lease sale data for all 50 states.
- 22 Analysis of BLM lease sale data.
- 23 Analysis of lease sale data. The previous administration sold 856,252 BLM-managed acres for oil and gas development in the lower-48 on average each year between January 2017 and January 21, 2021. In contrast, the current administration sold an average of 77,544 acres per year between January 22, 2021, and December 31, 2023.
- 24 FY2001 to FY2022 data from U.S. BLM. Oil and Gas Statistics. Fiscal Year 2022. at Table 4. Number of Acres Leased During the Fiscal Year. Retrieved 1 March 2023. https://www.blm.gov/sites/default/files/docs/2023-02/FY22_Oil%20and%20Gas%20Statistics.zip
- FY2023 data based on analysis of lease sale data for acres sold between October 1, 2022 and September 31, 2023.
- 25 Analysis of supplemental modeling results provided by Dr. Brian Prest in January 2022. Model developed for: Brian C. Prest, Supply-Side Reforms to Oil and Gas Production on Federal Lands: Modeling the Implications for CO₂ Emissions, Federal Revenues, and Leakage, 9 Journal of the Association of Environmental and Resource Economists 681, 688 (July 2022) <https://www.journals.uchicago.edu/doi/suppl/10.1086/718963> [hereinafter Prest 2022a]
- Also previously published as a working paper by Resources for the Future: Brian C. Prest, Supply-Side Reforms to Oil and Gas Production on Federal Lands: Modeling the Implications for CO₂ Emissions, Revenues, and Production Shifts at 7 (Dec. 13, 2021), https://media.rff.org/documents/WP_20-16__Dec_2021.pdf. [hereinafter Prest 2021]
- 26 See Appendix 1.

27 CBO (Congressional Budget Office). 2016. Options for increasing federal income from crude oil and natural gas on federal land. Congressional Budget Office, Washington, DC.

Further explanation at p.685 in Prest 2022a

28 In June 2023 the Biden administration finalized the Greater Chaco Region Withdrawal, prohibiting new oil and gas leasing and development on public lands within a 10-mile zone around Chaco Culture National Historical Park in New Mexico for a 20-year period. BLM assumes that the withdrawal would result in the foregone production of 206,737 bbl of oil and 3,759,416 mcf of natural gas per year (at C-1). We estimated lifecycle emissions by multiplying the foregone production by simplified lifecycle emission factors of 0.0660204 t CO_{2e}/mcf gas and 0.43 tCO_{2e}/barrel of crude oil.

See U.S. DOI. "Proposed Chaco Area Withdrawal" Environmental Assessment. November 2022. at Appendix C. at C-1 https://eplanning.blm.gov/public_projects/2016892/200507928/20070044/250076226/ChacoWithdrawalEA_Compiled_508V3.pdf

29 According to BLM's analysis for the Eastern Colorado RMP, the new alternative (Alt. D) chosen by the Biden administration in January 2024 could decrease GHG emissions stemming from the Royal Gorge Field Office by around 1.64 MMT CO_{2e} over the next 29 years compared to the previously approved plan (Alt. A) or around ~0.056 MMT CO_{2e} per year on average. See "Proposed Eastern Colorado Resource Management Plan & Final Environmental Impact Statement" BLM/CO/PL-23/001. Vol 3. Appendix B - at B-69, Table B.19. (June 2023)

30 In 2023 BLM released a draft Rock Springs Field Office Resource Management Plan, with a proposed conservation alternative that BLM estimates could decrease GHG emissions stemming from new oil and gas drilling in the plan's area by around 40% below the previously approved plan. BLM estimates the total GHG emissions from all BLM-authorized activities as 414.28 million metric tons CO_{2e} for Alt. A and 248.9 MMT CO_{2e} for Alt. B over 20 years. If BLM pursues a management alternative close to Alt. B for Rock Springs, then BLM could decrease GHG emissions stemming from the Field Office by around 8.27 MMT CO_{2e} per year on average for the next 20 years below the previously approved plan (Alt. A). See US BLM. Draft Rock Springs Field Office Resource Management Plan and EIS, vol. 2, tbl. T-4 at T-7.

31 In August 2023 BLM released the Colorado River Valley & Grand Junction RMP draft SEIS with a proposed conservation alternative that could close 75% of the 2 million acres to new oil and gas leasing. If the Biden administration chooses to pursue its announced preferred alternative (Alt. E) or something closer to Alt. F, then BLM could decrease GHG emissions stemming from these field offices by between 6-9% below the previously approved plan. Pursuing BLM's preferred alternative (Alt. E) could result in a reduction of between 14 MMT and 41 MMT CO_{2e} over the life of the plan compared to continuing the previously approved management plan, Alt. B (between -0.74 MMT and -2.042 MMT CO_{2e}/year over 20 years).

See Draft RMP SEIS for Colorado River Valley & Grand Junction. (August 2023) https://eplanning.blm.gov/public_projects/2016085/200525292/20083156/250089338/CRVFO_GJFO_Draft_SEIS_2023_Aug.pdf

To estimate lifecycle emissions we use: # of wells reduced below baseline due to each alternative in Table 2.6-2; low-end and high-end EURs/well for oil and for gas for the region from US EIA AEO OGSM Assumptions; and lifecycle emission factors of 0.43 tCO_{2e}/barrel of crude oil and 0.06602 tCO_{2e}/mcf of gas.

32 To approximate a reasonable range of production and lifecycle emissions due to the proposed withdrawal of 224,704 acres from future leasing we make the following assumptions. For a low estimate, we assume an EUR of 0 MMb of crude oil/well and 0.112 Bcf of natural gas/well and assume only 1 well per parcel (23 foregone wells). For the high estimate, we assume a high of 8 wells per square mile (or 2,809 foregone wells based on the acreage), 0.292 MMb crude oil/well and 0.990 Bcf natural gas/well. We use simplified lifecycle emission factors of 0.43 tCO_{2e}/barrel of crude oil and 0.06602 tCO_{2e}/mcf of gas. With these assumptions, we calculate that the annual average emissions reduced due to the Thompson Divide Withdrawal over 20 years could be between 0.009 MMT and 0.026 MMT. See Draft EA Thompson Divide Withdrawal. (December 2023) <https://www.fs.usda.gov/project/?project=63679>

- 33 The Colorado Big Game Corridor Amendment has the potential to reduce annual lifecycle emissions by around 680,000 metric tons CO₂e per year. If BLM chooses a conservation alternative close to what it analyzed for the conservation alternative (Alt. D) in the 2022 Draft RMPA and EIS, then GHG emissions stemming from new federal oil and gas between 2025 and 2050 could be 0.68 MMT CO₂e lower/year compared to continuing current management (Alt. A). See Draft Resource Management Plan Amendment and Draft Environmental Impact Statement for Big Game Habitat Conservation for Oil and Gas Management in Colorado. Vol. 3. Appendix I. at Table 3-8 and Table 3-18. https://eplanning.blm.gov/public_projects/2018400/200525996/20088828/250095010/Draft%20Volume%203_Appendices%20E-N.pdf
- 34 A settlement agreement requires BLM to consider a stronger alternative than that of Alternative B.1 in the 2020 Uncompahgre Field Office RMP, but Alt. B.1 is the closest data available to approximate the potential impact of a revised plan. Based on BLM's projected natural gas production difference across the alternatives, we estimate that emissions stemming from the field office could be around 11.64 MMT CO₂e lower over 20 years if BLM pursues a management plan closer to Alt. B.1 (or a reduction of around 0.582 MMT CO₂e per year compared to Alt. E). See US BLM. Uncompahgre Field Office Proposed RMP Revision and Final EIS. Vol. 2 At p.4-456, Table 4-83 https://eplanning.blm.gov/public_projects/lup/62103/175697/214067/Uncompahgre_Proposed_RMP_Final_EIS_-_Volume_II.pdf We use a simplified lifecycle emissions factor for gas of 0.06602 tons CO₂e/mcf.
- 35 US Department of the Interior. 2021. "Report on the Federal Oil and Gas Leasing Program." November 2021. <https://www.doi.gov/sites/doi.gov/files/report-on-the-federal-oil-and-gas-leasing-program-doi-eo-14008.pdf>
- 36 See Appendix 1 for further explanation. Estimate based on scaled Prest 2021 supplemental annual results for an increase from 12.5% to 18.75% onshore royalty rate. See Prest 2021 at Table A.7. for summary results of a baseline and high oil and gas price assumption scenario.
- 37 Estimates of the emissions reductions expected due to the provisions included in the Final Rule were not available at the time this report was finalized. However, BLM estimated that provisions in the Draft BLM Methane Waste Prevention Rule could reduce around 263,470 tons of methane from being released into the atmosphere per year (or - 6 MMT CO₂e/year in net emissions). See US BLM. Environmental Assessment: Waste Prevention, Production Subject to Royalties, and Resource Conservation Rule. (November 2022) at Table 3-3. DOI-BLM-HQ-3100-2023-0002-EA <https://www.regulations.gov/document/BLM-2022-0003-0003>
- See Final BLM Waste Prevention Rule when available in docket BLM-2022-0003 on www.regulations.gov
- 38 Coastal Plain draft SEIS. 2023.
- 39 See BLM Coastal Plain Vol.3. 2023."Alt. B" mirrors the alternative chosen by the previous administration in the 2020 Record of Decision for the Final Environmental Impact Statement for the Coastal Plain Oil and Gas Leasing Program, Alaska and "Alt. D" is the conservation alternative. Estimated total gross lifecycle emissions of life of leases under Alt. B is around 909 MMT CO₂e (140.3 MMT CO₂e midstream in Table 2-2; 14.8 MMT CO₂e midstream in Table 2-6; 754 MMT CO₂e downstream in Table 2-9) and under Alt. D (the conservation alternative) is around 223 MMT CO₂e. Alt D. (33.9 MMT CO₂e midstream in Table 2-4; 3.6 MMT CO₂e midstream in Table 2-8; 185.7 MMT CO₂e downstream in Table 2-11). Compared to Alt. B, analysis of the BLM's estimates indicates that pursuing Alt. D could have around 686 MMT CO₂e lower lifecycle gross emissions stemming from potential production over 50-70 years, representing a 75% decline below Alt. B potential total emissions or around 9 MMT CO₂e/year difference.
- 40 As noted by BLM in the draft SEIS. Vol. 1 p.1-3: "there is tremendous uncertainty regarding potential exploration and development in the Coastal Plain. Any development scenario at this point is highly speculative given that it is unknown whether or where future leases will be issued, whether or where exploratory drilling may occur under leases, and whether or where economically developable oil and gas discoveries may be made. This uncertainty is due in part to the remoteness and lack of previous exploration and development of the Coastal Plain; its harsh environment and challenging engineering considerations; and the extended time it has taken to go from leasing to development in other regions of the North Slope of Alaska, including in the National Petroleum Reserve-Alaska (NPR-A)."

Vol. 1 p.3-2: “In making these assumptions, the BLM and USFWS have striven to minimize the chance that the resultant impact analysis would understate potential impacts; therefore, the hypothetical development scenarios (Appendix B) are intended to represent optimistic high-production, successful discovery, in a situation of favorable market prices.”

41 BLM says that in order to minimize the chance that a resultant analysis will understate potential impacts, BLM models the management alternatives using assumptions that maximizes the magnitude and speed of production, assumes ongoing favorable market prices, and ongoing high consumer demand. Yet it is important to note that a rough comparison of the 2023 D-SEIS to other production projections for the Coastal Plain suggests that perhaps the BLM could be assuming relatively lower-end production levels compared to other assessments. For air-quality and climate purposes, this could mean that they could be potentially underestimating emissions. It appears that in the 2023 D-SEIS BLM actually assumes total production amounts that are closer to what BLM under the Trump administration assumed for their low-end case and it is a good deal lower than what EIA previously projected would be economically recovered per year even under its low-ANWR case. By taking the per-year combustion-based emissions for Alt B we are able to roughly calculate that in this assessment BLM assumed around 1.75 billion barrels of oil (BBO) produced over 70 years (around 744 million barrels out to 2050, depending on when production begins). So even though BLM calls this a high-development scenario, it appears to actually assume total production amounts that are closer to what BLM under the Trump administration assumed for their low-end case over 70 years (1.5 BBO for low-end case and 10 BBO for high-end case).

42 As of August 29, 2023, 20 international insurers had publicly committed to not insure and 29 global financial institutions had pledged not to finance oil and gas projects in the Arctic Refuge.

Insurance Industry Scorecard. 2023. <https://ourarcticrefuge.org/wp-content/uploads/2023/08/insurance-scorecard-2023.pdf>

43 Gwich'in Steering Committee and Gwich'in Youth Council Respond to Bank of America's Quiet Arctic Policy Shift; GSC Requests Meeting with Bank Leadership. 14 Feb. 2024. <https://ourarcticrefuge.org/gwichin-steering-committee-and-gwichin-youth-council-respond-to-bank-of-americas-quiet-arctic-policy-shift>

44 US BLM. NPR-A IAP Record of Decision. (25 April 2022) https://eplanning.blm.gov/public_projects/117408/200284263/20058238/250064420/2022_NPRA_IAP_ROD_508.pdf?utm_source=newsletter&utm_medium=email&utm_campaign=wp_climate202&wpisrc=nl_climate202

45 See US BLM. NPR-A Integrated Activity Plan and Environmental Impact Statement. Volume 1. At 96. Table 3-2 https://eplanning.blm.gov/public_projects/117408/200284263/20020342/250026546/Volume%201_ExecSummary_Ch1-3_References_Glossary.pdf The alternative that the Biden admin chose in 2022 (Alt A) represents around 50% lower potential lifecycle emissions (445 MMT CO₂e total or around 6.3 MMT CO₂e per year over 70 years) compared to under the alternative that the previous administration chose in 2020 for the NPR-A IAP (Alt. E). Estimates from Table 3-2 for the high-end potential production over 70 years. (49% = (463,517 MMT CO₂e - 908,856 MMT CO₂e)/908,856 MMT CO₂e))

46 “Biden-Harris Administration Takes Major Steps to Protect Arctic Lands and Wildlife in Alaska.”

U.S. Department of the Interior, September 6, 2023. <https://www.doi.gov/pressreleases/biden-harris-administration-takes-major-steps-protect-arctic-lands-and-wildlife-alaska>.

And

Bureau of Land Management. “Management and Protection of the National Petroleum Reserve: Alaska.” Regulations.gov, 2023. <https://www.regulations.gov/document/BLM-2023-0006-0001>.

47 Princeton University's Net Zero America report. 2021. Slide #245 range for E+ to E+RE+ scenarios.

- 48 US Energy Information Administration (EIA). Electric Power Monthly. Table 6.1. Electric Generating Summer Capacity Changes (MW). As of end of September 2023. https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=table_6_01
- 49 FY22 BLM solar projects https://www.blm.gov/sites/default/files/docs/2023-03/PROJECT_LIST_SOLAR_FY2022.pdf
 FY22 BLM Wind Project list https://www.blm.gov/sites/default/files/docs/2021-11/PROJECT%20LIST%20WIND_October%202021.pdf
 Geothermal as of Sept. 30, 2023 https://www.blm.gov/sites/default/files/docs/2023-11/energy_renewable_GeothermalProjectInfo_20230930.xlsx
- 50 BLM. Renewable Energy Projects Approved (as of April 1, 2024). <https://www.blm.gov/programs/energy-and-minerals/renewable-energy/active-renewable-projects#Approved>.
 As of April 1, 2024, BLM posted that they had 66 projects representing 32 GW of clean energy under review. 37 of these projects are at the NEPA or pre-NEPA stage of review. 33 of these projects are solar, wind, or geothermal, representing a combined 18,069 MW of renewable energy (16,275 solar, 1,600 MW wind, and 194 MW geothermal). In addition, BLM has 1,357 MW of Gen-Tie projects at the NEPA or pre-NEPA stages of review.
- 51 BLM. Draft Programmatic Environmental Impact Statement for Utility-Scale Solar Energy Development. Vol. 1. January 2024. Document #DOI-BLM-HQ-3000-2023-0001-RMP-EIS https://eplanning.blm.gov/public_projects/2022371/200538533/20102762/251002762/2023%20Draft%20Solar%20PEIS%20Volume%201%201-10-2024_508compliant.pdf
 [hereinafter, BLM Draft Solar PEIS 2024]
- 52 BLM Draft Solar PEIS 2024 At ES-5.
 Note, the only BLM-administered areas that will not be subject to the PEIS in the 11-state planning area include lands covered by the decision area of the Desert Renewable Energy Conservation Plan (DRECP) Amendment to the California Desert Conservation Area Plan, Bishop RMP, and Bakersfield RMP.
- 53 BLM Draft Solar PEIS 2024 At 5-86 and ES-23.
- 54 BLM Draft Solar PEIS 2024. At 5-86 and ES-23.
- 55 “Establishment of Renewable Energy Coordination Offices.” Bureau of Land Management, May 31, 2022. <https://www.blm.gov/policy/ib-2022-040>.
- 56 Rights-of-Way, Leasing, and Operation for Renewable Energy. Proposed Rule. <https://www.regulations.gov/document/BLM-2023-0004-0001>
- 57 Executive Order 14072. <https://www.whitehouse.gov/briefing-room/presidential-actions/2022/04/22/executive-order-on-strengthening-the-nations-forests-communities-and-local-economies>
- 58 US Forest Service, USDA. 88 FR 5232. 27 January 2023. <https://www.federalregister.gov/documents/2023/01/27/2023-01483/special-areas-roadless-area-conservation-national-forest-system-lands-in-alaska>
- 59 U.S. Department of Agriculture and U.S. Department of the Interior. April 2023.
 “Mature and Old-Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management.” FS-1215a
<https://www.fs.usda.gov/sites/default/files/mature-and-old-growth-forests-tech.pdf>

- 60 U.S. Department of Agriculture and U.S. Department of the Interior. April 2023.
 “Mature and Old-Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management.” FS-1215a
<https://www.fs.usda.gov/sites/default/files/mature-and-old-growth-forests-tech.pdf>
- 61 U.S. Department of Agriculture. Dec. 2023. “Biden-Harris Administration Proposes First-of-its Kind National Forest Plan Amendment to Conserve and Steward Old Growth Forests.” <https://www.usda.gov/media/press-releases/2023/12/19/biden-harris-administration-proposes-first-its-kind-national-forest>
- 62 U.S. Department of Agriculture. Dec. 2023. “Biden-Harris Administration Proposes First-of-its Kind National Forest Plan Amendment to Conserve and Steward Old Growth Forests.” <https://www.usda.gov/media/press-releases/2023/12/19/biden-harris-administration-proposes-first-its-kind-national-forest>
- And
- Forest Service. 2020. “Alaska Roadless.” <https://www.regulations.gov/docket/FS-2021-0007>
- 63 SEI, Climate Analytics, E3G, IISD, and UNEP. (2023). The Production Gap: Phasing down or phasing up? Top fossil fuel producers plan even more extraction despite climate promises. Stockholm Environment Institute, Climate Analytics, E3G, International Institute for Sustainable Development and United Nations Environment Programme. at p.48
<https://doi.org/10.51414/sei2023.050>
- 64 Brian C. Prest, Partners, Not Rivals: The Power of Parallel Supply-Side and Demand-Side Climate Policy. Resources for the Future (Apr. 2022). [hereinafter Prest 2022b]
- 65 Prest 2022b
- 66 On their own, demand-side policies generate emissions leakage by reducing the price of fossil fuels, making it cheaper for consumers in other countries or jurisdictions to burn more. On their own, supply-side policies generate leakage by causing oil prices to rise, which encourages producers to extract more oil outside of the regulated region. These shifts in consumption or production outside of the regulated regions are called leakage. It occurs with either type of policy pursued on its own.
- 67 Prest 2022b
- 68 E.g., USGCRP, 2023: Fifth National Climate Assessment. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA.
<https://doi.org/10.7930/NCA5.2023>.
- 69 2022 BLM Specialist 2023 at Figure 7-2
- 70 According to BLM statistics: “About 23 million Federal acres were under lease to oil and gas developers at the end of FY 2022. Of that, about 12.4 million acres are producing oil and gas in economic quantities.” [0.54 = 12.4 million/23 million] From BLM website accessed on 12 March 2024. <https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/about>
- $54\% \times 856,252 = 461,632$
- 71 $[-0.83 = (77,544 - 461,632) / 461,632]$