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Survey of Greenhouse Gas Considerations in Federal Environmental Impact Statements and Environmental Assessments for Fossil Fuel-Related Projects, 2017-2018

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Executive Summary

Climate change is already generating enormous costs to the environment and public health both in the United States and around the world. These costs will only escalate over the time with increasing greenhouse gas (GHG) emissions. Under the National Environmental Policy Act (NEPA), U.S. federal agencies must assess the environmental effects of proposals for major federal projects, plans and programs before deciding if they should proceed. To conduct a meaningful environmental review of proposed projects, federal agencies must carefully consider how these projects contribute to climate change and greenhouse gas emissions—particularly for projects concerning fossil fuel extraction, transport, and use. The courts have established that NEPA includes obligations to consider climate change effects. Under the Obama administration, the Council for Environmental Quality sought to clarify those obligations by issuing guidance on how NEPA analysis and documentation should address GHG emissions. The Trump administration has sought to roll back and replace those recommendations, raising new questions about how federal agencies have assessed, and will continue to assess, climate change effects during environmental review.

To evaluate how federal agencies are addressing climate change in environmental reviews under NEPA, this report surveys of federal environmental impact statements (EISs) and environmental assessments (EAs) completed in 2017-2018 for projects related to fossil fuel production, processing, and transport. In total, the report reviews sixteen EISs and ten EAs which met these criteria within the selected timeframe. The report

focuses on fossil fuel project proposals because of their contributions to greenhouse gas emissions.

Top-level findings from the survey include:

- When reviewing proposals for coal, oil, and gas extraction, agencies did typically quantify both direct and indirect emissions from the proposal, including emissions associated with the combustion of the produced fuels. However, in resource management plans that would open federal lands for fossil fuel extraction, the reviewing agency did not quantify emissions.
- There are no instances in which agencies determined that the impact of fossil fuel leasing on greenhouse gas emissions would be "significant" despite predicting that these leases would generate millions of tons of carbon dioxide equivalents (CO_2e).
- Projects found to have "insignificant" environmental effects would collectively contribute substantial greenhouse emissions. Although federal agencies produce EAs exclusively for proposed projects which have been determined not to have significant impacts, the ten EA projects alone would contribute between 654 and 683 million metric tons of CO_2e over their lifetime, approximately one-tenth of the annual GHG emissions of the entire United States.
- Agencies rarely quantify the cumulative emissions of the proposed action when added to other recent and reasonably foreseeable federal leases for fossil fuel production. While the majority of surveyed EISs and EAs disclose

GHG emissions quantitatively, or in some instances only qualitatively, most do not contain a more comprehensive analysis of how fossil fuel production on public lands will affect fossil fuel consumption and greenhouse gas emissions in the aggregate.

- Agencies fail to account for the public health and environmental costs of GHG emissions with a social cost of carbon metric and rarely consider opportunities to mitigate GHG emissions associated with a project. Less than one-sixth of the analyzed environmental reviews mention commitments to reducing GHG emissions. Further, the reviewing agencies do not estimate the social costs to better understand the magnitude of the emissions' impacts in any of the surveyed documents.

Contents

Abbreviations

APD	Application for Permit to Drill
BLM	Bureau of Land Management
BOEM	Bureau of Ocean Energy Management
CEQ	Council on Environmental Quality
CH_4	Methane
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DOD	Department of Defense
DOI	Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FONSI	Finding of No Significant Impact
FSEIS	Final Supplemental Environmental Impact Statement
GHG	Greenhouse Gas
GWP	Global Warming Potential
LNG	Liquefied Natural Gas
MT CO_2e	Metric Tons of Carbon Dioxide Equivalent
OSMRE	Office of Surface Mining Reclamation and Enforcement
PEIS	Programmatic Environmental Impact Statement
RMP	Resource Management Plan
ROD	Record of Decision
SEIS	Supplemental Environmental Impact Statement
USDA	United States Department of Agriculture
USFS	United States Forest Service

I: Introduction

Signed into law in 1970, the National Environmental Policy Act (NEPA) mandates that federal agencies assess the environmental effects of proposals for major federal projects, plans and programs before deciding if they should proceed.[1] This process aims to ensure that all federal agencies and the public are informed of the consequences of federal decisions on ecosystems and public health. If an agency determines that a proposed action is likely to have significant environmental effects, then the agency must prepare and publish an Environmental Impact Statement (EIS). If no significant environmental impacts are identified, an agency can prepare a shorter Environmental Assessment (EA). Following the publication of an EA, the agency prepares either a Finding of No Significant Impact (FONSI) or a full EIS.

This report surveyed recent EISs and EAs for proposed projects related to fossil fuel production to assess how federal agencies are measuring and evaluating the significance of greenhouse gas (GHG) emissions as part of their environmental review. The federal agencies which produced these EISs and EAs include the US Department of the Interior (DOI), the US Department of Defense (DOD), and the US Department of Agriculture (USDA).[2]

[1] National Environmental Policy Act of 1969 (NEPA) § 102, 42 U.S.C. § 4332 (2018).
[2] Within DOI, the reviewing agencies include the Bureau of Land Management (BLM), the Bureau of Ocean Energy Management (BOEM), and the Office of Surface Mining (OSMRE). Under DOD, the reviewing agency is the US Army Corps of Engineers. Within the USDA, the reviewing agency is the United States Forest Service (USFS).

The report evaluates sixteen EISs and ten EAs prepared pursuant to NEPA and issued in 2017 and 2018.[3] The sixteen Trump-era EISs are all related to fossil fuels, as they either directly pertain to the extraction of fossil fuels or to opening lands to enable fossil fuel extraction. The sixteen Trump-era EISs include nine fossil fuel extraction projects, as well as six Greater Sage-Grouse Resource Management Plans and EISs and one offshore acoustic testing project in the Gulf of Mexico. The nine fossil fuel extraction EISs include three coal mining projects, three onshore oil leases, two offshore oil leases in the Gulf of Mexico (one multi-sale programmatic environmental impact statement (PEIS) and one project-specific supplemental environmental impact statement (SEIS)), and one natural gas production and pipeline project. The Greater Sage-Grouse Resource Management Plans (RMPs) modify previous RMPs issued in 2015 under the Obama administration, primarily reducing environmental protections for the sage-grouse and increasing the availability of federal lands for extractive activities. The acoustic testing project would use the measurement of sound emissions to identify suitable locations in the Gulf of Mexico for activities such as offshore oil and gas extraction as well as offshore renewable energy production.

If approved as proposed, these projects will support a large volume of fossil fuel extraction. Among the EISs, the proposal for Rosebud Mine Area F would enable 70.8 million tons of coal to be extracted over the lifetime of the project.[4] The Nanushuk

[3] These sixteen EISs and EAs are a sampling of environmental reviews related to fossil fuel extraction and infrastructure issued in 2017 and 2018. The sixteen EISs reviewed tier to seven older Programmatic Environmental Impact Statements (PEISs), which are referenced in the report where necessary or helpful to the analysis. The sixteen EISs represent all the fossil fuel extraction-related EISs issued in 2017 and 2018. The ten EAs are for proposed coal, oil, and gas production leases and plans and were issued between 2017-2018.
[4] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=262700.

Project alone would be responsible for 120,000 barrels of oil production per day.[5] In aggregate, the maximum estimated lifetime direct and indirect emissions from the analyzed proposed fossil fuel extraction projects as disclosed by the EISs (not including the sage-grouse RMPs or acoustic testing project) would be 1.36 billion metric tons of carbon dioxide equivalents (CO_2e), or roughly 21% of total direct US GHG emissions in 2017.[6]

Among the ten EAs are four oil and gas lease parcel sales, five modifications to coal plans or leases, and one coal mining plan. All of the EAs were issued in 2017 and 2018 during the Trump administration. Many of the reviews are tiered to or reference EISs, RMPs, and Records of Decision (RODs) published in previous years. If approved, the proposed projects related to the ten EAs would be responsible for producing a sizable quantity of GHG emissions, even though they represent only a sampling of the projects proposed in 2017 and 2018 related to fossil fuel production, processing, and transport. These ten EAs would produce an estimated maximum of 668 million metric tons of CO_2e, or approximately 10% of total direct US GHG emissions in 2017.[7]

The majority of the EAs and EISs included in this survey disclosed the estimated direct and indirect emissions that would be generated as a result of the proposed fossil

[5] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=260614.
[6] For calculation of cumulative emissions of surveyed proposed project, see total CO_2e emissions calculation in Table 1 (Pages 12-14). In 2017, the EPA estimates that U.S. greenhouse gas emissions totaled 6.46 billion metric tons of carbon dioxide equivalents. United States Environmental Protection Agency, Inventory of US Greenhouse Gas Emissions and Sinks, *available at* https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.
[7] For calculation of cumulative emissions of surveyed proposed project, see total CO_2e emissions calculation in Table 2 (Pages 15-16). In 2017, the EPA estimates that U.S. greenhouse gas emissions totaled 6.46 billion metric tons of carbon dioxide equivalents. United States Environmental Protection Agency, Inventory of US Greenhouse Gas Emissions and Sinks, *available at* https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.

fuel production activities, including downstream emissions from the combustion of the produced fuels. In many cases, the estimated emissions impact was quite large. (See Table 1.) However, there was no instance in which a federal agency concluded that the emissions impact would be significant. The discussion of significance tended to be quite limited, and agencies did not use available tools such as the social cost of carbon (SCC) to better evaluate the magnitude of the emissions impact.[8] Additionally, in most cases, agencies did not examine the cumulative impact of the proposal when added to other recent and reasonably foreseeable fossil fuel leasing approvals (such as those issued in the same region or by the same agency as the proposal under review). There were some instances in which agencies discussed potential mitigation measures for reducing GHG emissions, but agencies did not firmly commit to undertaking such measures.

Methodology

This report analyzes the consideration of greenhouse gas emissions in the identified EISs and EAs related to fossil fuel production. The EISs were obtained from the comprehensive EIS database of the Environmental Protection Agency (EPA). All of the EISs pertaining to fossil fuel extraction during 2017 and 2018 were evaluated. The EAs were sourced directly from the websites of the agencies which conducted the reviews. The EAs were selected in order to represent a range of types of projects and geography around the US. The results were recorded in individual Excel spreadsheets for each

[8] There was only one EIS in which the agency quantified the social cost of carbon associated with the projected emissions. *See* Liberty and Production Plan EIS.

environmental review. The spreadsheets were then compiled into an Excel workbook which is on file with the Sabin Center.

The analysis evaluated the environmental review documents across three major categories: the effects of the proposed action on climate change, the effects of climate change on the proposed action, and the cumulative and market impacts of fossil fuel production. These categories were selected to accomplish two overarching objectives. First, the categories ensure that the review captured not only how fossil fuel-related projects will contribute to climate change, but also how the effects of climate change could affect these projects. Second, these categories ensure analysis of whether agencies considered GHG emissions only within the scope of the project or in the context of emissions from larger geographic areas and within the national energy market as a whole. The survey assessed the following elements of each document reviewed (all emissions refer to GHG emissions):

<u>Effects of Proposed Action on Climate Change</u>

1. Scope of proposed action (connected actions and tiered documents)
2. Direct emissions
3. Indirect emissions
4. Alternatives
5. Significance
6. Mitigation (of GHG emissions)

Effects of Climate Change on Proposed Action

1. Effects of climate change
2. Alternatives
3. Adaptation measures

Cumulative Emissions and Market Impacts of Fossil Fuel Production

1. Cumulative emissions disclosure
2. Analysis of energy market impacts and net emissions

Table 1 lists all of the fossil fuel-related EISs analyzed for the survey. The table includes the specific project type, the lead agency that drafted the environmental review, and the total direct and indirect lifetime GHG emissions estimate in metric tons (MT) of CO_2e associated with each project as listed in the EIS or EA. The CO_2e estimates listed are based on the lifetime emissions provided in the individual EISs and EAs. Table 2 provides the inventory of fossil fuel-related EAs analyzed. The table includes the specific project type, the lead agency that drafted the environmental review, and the total direct and indirect GHG emissions estimate in metric tons (MT) of CO_2e associated with each project.

Table 1: 2017-2018 Fossil Fuel-Related EISs

Project Name	**Project Type**	**Lead Agency**	**Total GHG Emissions (MT CO_2e)**
Western Energy Company's Rosebud Mine Area F[9]	Fossil Fuel Extraction	OSMRE	235,355,989
Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth 2 Development Project: Final Supplemental Environmental Impact Statement (FSEIS)[10]	Fossil Fuel Extraction	DOI	74,006,596
Nanushuk Project[11]	Fossil Fuel Extraction	Army Corps of Engineers	513,290,000 (maximum)
Liberty Development and Production Plan[12]	Fossil Fuel Extraction	BOEM	64,570,000
Alton Coal Tract Lease[13]	Fossil Fuel Extraction	BLM	111,337,750
Normally Pressured Lance Natural Gas Development Project[14]	Fossil Fuel Extraction	BLM	190,217,170
Federal Coal Lease Modifications COC-1362 & COC-67232[15]	Fossil Fuel Extraction	USFS	38,339,650 to 40,293,286
Gulf of Mexico Outer Continental Shelf Lease Sale[16]	Fossil Fuel Extraction	BOEM	126,341,250 (taken from tiered PEIS issued in 2016)[17]
Gulf of Mexico Outer Continental Shelf Lease Sale SEIS[18]	Fossil Fuel Extraction	BOEM	Included in above

[9] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=262700.
[10] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=256362.
[11] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=260614.
[12] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=256207.
[13] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=253488.
[14] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=251808.
[15] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=238724.
[16] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=242803.
[17] *Available at* https://www.boem.gov/National-OCS-Program-for-2017-2022/.
[18] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=242803.

Nevada and Northeastern California Greater Sage Grouse Proposed Resource Management Plan Amendment[19]	Resource Management Plan	BLM	Not disclosed
Oregon Greater Sage Grouse Proposed Resource Management Plan Amendment[20]	Resource Management Plan	BLM	Not disclosed
Northwest Colorado Greater Sage Grouse Proposed Resource Management Plan Amendment[21]	Resource Management Plan	BLM	Not disclosed
Idaho Greater Sage Grouse Proposed Resource Management Plan Amendment[22]	Resource Management Plan	BLM	Not disclosed
Wyoming Greater Sage Grouse Proposed Resource Management Plan Amendment[23]	Resource Management Plan	BLM	Not disclosed
Utah Greater Sage Grouse Proposed Resource Management Plan Amendment[24]	Resource Management Plan	BLM	Not disclosed
Geological and Geophysical Activities on the Gulf of Mexico Outer Continental Shelf[25]	Resource Management Plan	BOEM	Not disclosed
Total Emissions[26]			**1,355,412,041 to 1,353,458,405**

[19] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=262925.
[20] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=263015.
[21] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=262976.
[22] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=262943.
[23] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=262968.
[24] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=262994.
[25] *Available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=236760.
[26] Total emissions calculation only includes projects that disclosed emissions.

Table 2: 2017-2018 Fossil Fuel-Related EAs

Project Name	**Project Type**	**Lead Agency**	**Total GHG Emissions (MT CO_2e)**
Oil and Gas Lease Parcel Sale, December 11, 2018 (Montana)[27]	Oil and Gas Lease Parcel Sale Environmental Assessment	BLM	352,000 to 361,000
December 2018 Competitive Oil and Gas Lease Sale (Nevada)[28]	Oil and Gas Lease Parcel Sale Environmental Assessment	BLM	65,100 to 17,515,600
September 2018 Competitive Oil and Gas Lease Sale (Pecos District Office, New Mexico)[29]	Oil and Gas Lease Parcel Sale Environmental Assessment	BLM	304,361,229
South Fork Federal Coal Lease Modifications UTU-84102 and U-63214 Environmental Assessment[30]	Coal Lease Modification Environmental Assessment	BLM	14,916,013
Bull Mountains Mine No. I Federal Mining Plan Modification Environmental Assessment: Musselshell County and Yellowstone County, Montana [Federal Coal Lease MTM 97988; May 11, 2018][31]	Mining Plan Modification Environmental Assessment	OSMRE	114,300,000 + < 900,000 + < 900,000
Greens Hollow Tract Mining Plan Modification Supplemental Environmental Assessment[32]	Mining Plan Modification Supplemental Environmental Assessment	OSMRE	191,805,267

[27] *Available at* https://eplanning.blm.gov/epl-front-office/projects/nepa/108993/160291/195985/Environmental_Assessment_December_11_2018_Lease_Sale.pdf.
[28] *Available at* https://eplanning.blm.gov/epl-front-office/projects/nepa/112280/160464/196208/DOI-BLM-NV-L000-2018-0002-EA_Final.pdf.
[29] *Available at* https://eplanning.blm.gov/epl-front-office/projects/nepa/103545/160256/195950/Sept_2018_Lease_Sale_EA_10-21-18_final.pdf.
[30] *Available at* https://eplanning.blm.gov/epl-front-office/projects/nepa/89382/148046/181900/South_Fork_Federal_Coal_Lease_Final_EA_6.12.18.pdf.
[31] *Available at* https://www.wrcc.osmre.gov/programs/federalLands/NEPA_SignalPeak_EA_080318-051118.pdf.
[32] *Available at* https://www.wrcc.osmre.gov/programs/federalLands/NEPA_SufcoMine_EA.pdf.

The Falkirk Mining Company ½ Section 10 Federal Coal Mining Plan Supplemental Environmental Assessment[33]	Coal Mining Plan Supplemental Environmental Assessment	OSMRE	6,348,120
Cherry Creek Development Plan Oil and Gas Wells, Access Roads, and Utilities (McKenzie County, North Dakota, January 2018)[34]	Oil and Gas Development Project Environmental Assessment	USFS	22,408
Federal Coal Lease Modification and Mine Permit Revision and Renewal: King II Mine, Colorado[35]	Coal Lease Modification and Mine Permit Revision and Renewal Environmental Assessment	BLM	20,346,229 to 30,519,343
February 2017 Oil and Gas Lease Sale[36]	Oil and Gas Lease Parcel Sale Environmental Assessment	BLM	1,249,065
Total Emissions[37]			**639,849,420 to 668,282,034**

[33] *Available at* https://www.wrcc.osmre.gov/programs/federalLands/NEPA_FalkirkMine_Environmental_Assessment.pdf.
[34] *Available at* https://www.fs.usda.gov/nfs/11558/www/nepa/104761_FSPLT3_4175710.pdf.
[35] *Available at* https://eplanning.blm.gov/epl-front-office/projects/nepa/70895/127910/155610/King_II_Lease_Mod_Final_EA_2017-1012.pdf.
[36] *Available at* https://eplanning.blm.gov/epl-front-office/projects/nepa/61831/81752/95974/2016.09.16_2017OGLS_FINAL.pdf.
[37] Total emissions calculation only includes projects that disclosed emissions.

II: Analysis of Survey Results

This section summarizes the trends found among the environmental review documents regarding the scope of direct and indirect emissions disclosure, methods to calculate greenhouse gas emissions, alternatives and mitigation strategies, consideration of cumulative impacts across multiple leasing decisions, determinations of significance, and use of the social cost of carbon. The analysis considers these trends separately across the EISs and then the EAs. While the survey is not a comprehensive review of all relevant fossil fuel-related environmental reviews completed in 2017-2018, it reveals a trend toward minimal consideration of climate change impacts during environmental review.

Scope of Direct and Indirect Emissions Disclosure

To assess how robustly the environmental review documents considered GHG emissions associated with the proposed projects, this analysis evaluates disclosure of both direct and indirect emissions. More specifically, the scope of analysis encompasses and distinguishes between disclosure of *direct emissions* generated by the proposed action and occurring concurrently in the same place where the action is located and *indirect emissions* caused by the action and reasonably foreseeable but occurring later in time or farther removed in distance. This section will review trends among EISs first and then proceed to review of the EAs.

In total, seven (78%) of the nine 2017-2018 EISs for fossil fuel extraction projects (not including the sage-grouse RMPs or acoustic testing project) quantitatively disclose both direct and indirect GHG emissions. The only two EISs that do not contain

quantitative disclosures of this type are the Gulf of Mexico Outer Continental Shelf Oil and Gas Lease Sales 2017-2022 EIS and the Gulf of Mexico Outer Continental Shelf Lease Sale SEIS. The latter tiers to the former. Additionally, both of these EISs tier to the Outer Continental Shelf Oil and Gas Leasing Program: 2017-2022 EIS issued in 2016, which quantifies both direct and indirect project GHG emissions. In short, all nine fossil fuel extraction EISs issued in 2017-2018 either quantitatively disclose direct and indirect GHG emissions or tier to a PEIS that quantitatively discloses direct and indirect GHG emissions.

In general, agencies calculated direct emissions for sub-categories such as transportation, onsite energy usage, and methane leakage by multiplying projected operations data by emissions factors obtained from organizations such as the EPA and The Climate Registry.[38,39] Agencies summed the sub-components of direct emissions to calculate total direct emissions. The precise data and emissions factors vary from project to project. The same seven EISs that quantitatively disclose direct GHG emissions also quantitatively disclose indirect GHG emissions. Most EISs calculate end-use emissions from fossil fuel combustion, but other sub-categories of indirect and downstream emissions were not typically quantified (e.g., processing and transportation emissions). To calculate end-use emissions, agencies multiplied projected production data (supplied by applicants) by emissions factors from agencies such as the EPA.

[38] EPA, Conversion Factors for Hydrocarbon Emission Components, *available at* https://www3.epa.gov/otaq/models/nonrdmdl/nonrdmdl2010/420r10015.pdf.
[39] The Climate Registry, 2016 Default Emission Factors, Table 13.7, *available at* https://www.theclimateregistry.org/wp-content/uploads/2014/11/2016-Climate-Registry-Default-Emission-Factors.pdf.

To more specifically analyze the extent of disclosure of indirect emissions, the survey of EISs and EAs recorded mentions of "upstream emissions," which are the emissions from project inputs, and "downstream emissions," which are the emissions from the transportation, processing or use of project outputs.[40] The review of EISs and EAs also recorded GHG emissions from induced vehicle trips and off-site energy production. Notably, none of the EISs disclose upstream emissions as defined by the Sabin Center to include emissions sources such as embedded carbon in construction materials.[41] Disclosure of indirect project emissions is less consistent across the projects. The two Gulf of Mexico offshore oil production EISs qualitatively disclose downstream emissions and tier to the 2016 programmatic EIS, which quantifies downstream emissions. Further, seven of the nine fossil fuel EISs (78%) quantitatively disclose downstream emissions from transportation, processing, and/or combustion. This group of EISs includes the Liberty Development and Production Plan EIS, which quantifies these emissions but does not disaggregate them from total lifecycle GHG emissions. In addition, one EIS quantitatively discloses GHG emissions from induced vehicle trips and one qualitatively discusses these emissions while the rest do not include any mentions. None of the EISs disclose emissions from off-site energy production.

Emissions were not quantified for the sage grouse RMP EISs or the acoustic testing EIS. According to the 2018 sage-grouse RMP EISs, the RMPs include management actions

[40] The terms "upstream emissions" and "downstream emissions" rely upon definitions by the Sabin Center.
[41] The Gulf of Mexico Outer Continental Shelf Lease Sale SEIS, however, uses the term "upstream emissions" to refer to direct emissions as defined by the Sabin Center. Gulf of Mexico Outer Continental Shelf Lease Sale SEIS, §4.1.2.

that could significantly increase the amount of land available for fossil fuel leasing.[42] However, the agency (BLM) did not estimate the potential volume of fossil fuels that could be produced from these lands or the resultant direct and indirect GHG emissions. It is understandable that BLM did not attempt to quantify emissions in the absence of fossil fuel production estimates; however, various commenters recommended that BLM look more closely at potential oil and gas production scenarios and the corresponding emissions impacts given the potential scale of oil and gas production that could occur under these revised RMPs. As for the Gulf of Mexico acoustic testing project: the purpose of the proposed activities was to identify areas that are suitable for offshore oil production, among other offshore activities, and thus the agency (BOEM) did not have the data necessary to quantify future fossil fuel production or the impacts on emissions.

Moving on to review of the EAs, each of the ten EAs provides a quantitative estimate for projected direct emissions. While the majority of environmental reviews provide a single estimate for projected emissions, two of the ten EAs (20%) provide a range of emissions: the December 2018 Competitive Oil and Gas Lease Sale (Nevada) and the Bull Mountains Mine No. I Federal Mining Plan Modification Environmental Assessment: Musselshell County and Yellowstone County, Montana [Federal Coal Lease MTM 97988; May 11, 2018]. One EA, the December 2018 Competitive Oil and Gas Lease Sale (Nevada) ("December 2018 EA"), provides a significant range of estimated emissions.

[42] *See* Hannah Nordhaus, *An Iconic Bird Just Lost Important Habitat Protections: What It Means,* National Geographic (Mar. 21, 2019) (the new plans would lift protections on nearly nine million acres of habitat, making it possible to eventually issue oil and gas leases on these lands).

For this EA, BLM reports projections ranging from 65,100 to 315,600 metric tons of CO_2e as direct annual emissions.

Of the ten EAs, eight (80%) disclose quantitative estimates for indirect emissions. One EA offers a qualitative discussion of indirect estimates. In one EA, the December 2018 Competitive Oil and Gas Lease Sale (Nevada) ("December 2018 EA"), BLM reports a range of annual emissions of 0 to 860,000 metric tons CO_2e, amounting to a wide range of estimated lifetime emissions during the 20-year duration of the project of 0 to 17,200,000 metric tons CO_2e. An EA to which the December 2018 EA is tiered also discloses that, "[s]ome end uses of fossil fuels extracted from Federal leases include… fuel oils for heating… production of asphalt and road oil; and the feedstocks used to make chemicals, plastics, and synthetic materials."[43]

The one EA that does not disclose the projected indirect emissions is for the February 2017 Oil and Gas Lease project in Utah. The EA states that, "[i]t is not possible to estimate indirect GHG emissions from leasing actions, as it is not possible to know what level of production will occur, or could likely occur, from issuance of any leases authorized under a lease sale EA."[44] Like the EISs, none of the EAs disclose upstream GHG emissions (e.g., from embedded carbon in construction materials). Among the ten EAs, six (60%) disclose downstream emissions quantitatively, and one (10%) includes qualitative emissions estimates. In regard to vehicle trips, five of the ten EAs (50%) mention this type of associated emission. Three of the EAs (30%) quantitatively discuss

[43] BLM, Preliminary Environmental Assessment, DOI-BLM-NV-L030-2017-0021–EA August, 2017 December 2017 Competitive Oil and Gas Lease Sale, Page 29, *available at* https://eplanning.blm.gov/epl-front-office/projects/nepa/85574/137283/167637/2017O&G_EA_FINAL-20170926_(2)_508.pdf.
[44] BLM, February 2017 Oil and Gas Lease, Page 38.

emissions associated with vehicle trips and two (20%) qualitatively discuss these emissions. In terms of emissions from off-site energy production, one of the ten (10%) discloses estimated emissions quantitatively while one other includes estimates qualitatively.

It is notable that although federal agencies produce EAs solely for proposals which are determined not to have significant impacts, these ten projects alone would contribute between 640 and 668 million metric tons of CO_2e throughout their lifetimes, approximately one-tenth of the annual GHG emissions of the entire United States. Further, NEPA only allows an agency to rely on an EA if the agency has found that a proposed project's impacts are not significant; an agency must prepare an EIS if the agency has found that the project's impacts are significant or if there is a question as to whether there are significant impacts.

Methods to Calculate Emissions

Perfect Substitution and Gross Downstream Emissions versus Net Downstream Emissions

There are two ways that agencies evaluated downstream emissions (i.e. emissions from end use of the produced fossil fuels): (i) estimating the total gross downstream emissions by multiplying the amount of fuels produced by a combustion emissions factor; and (ii) estimating the net downstream emissions, taking into account the effect of the proposed fossil fuel production on energy markets, fuel prices, and overall patterns of

fossil fuel consumption.[45] For projects in which the EIS or EA calculated net emissions, the Sabin Center determined whether the EIS/EA explicitly claimed perfect substitution. Perfect substitution means that a project has no net GHG impacts because, were it not to be developed, other projects would be developed instead, leading to higher net global emissions.

Out of the nine EISs for fossil fuel extraction projects, six (67%) disclose only gross emissions (and one of these six EISs contains only a qualitative disclosure of gross emissions). The remaining three fossil fuel EISs contain estimates of net emissions.

The three EISs that disclose net project emissions all reach different conclusions about the net impacts of the respective projects. For example, the Gulf of Mexico Outer Continental Shelf Lease Sale SEIS qualitatively discusses market substitution.[46] In addition, the Liberty Development and Production Plan, an onshore oil production project in Alaska, estimates associated market impacts of oil, including net emissions, using economic modeling. The agency explicitly states that it does not claim perfect substitution. The agency finds that emissions will be higher if the project is not developed rather than if the project is developed due to substitution of higher-emitting fuels.[47] The Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth 2 Development Project FSEIS (onshore oil production) analyzes market impacts but does not claim perfect substitution. It finds that emissions will be higher if the project is developed than if it is not. Of the ten EAs evaluated, only one (10%) includes a discussion

[45] The second approach (the "net emissions" approach) assumes that the production of fossil fuels on federal lands will offset the production of fossil fuels from other sources.
[46] BOEM, Gulf of Mexico Outer Continental Shelf Lease Sale SEIS, §4.1.2.
[47] BOEM, Liberty Development and Production Plan, §4.2.4.1.

of market impact or substitution. One explanation for this lack of discussion is that projects which generate the publication of EAs have effects which are determined to be not significant.

Choice of Global Warming Potential (GWP)

GWP is the measure of how much energy the emissions of one ton of a gas will absorb over a given period of time relative to the emissions of one ton of CO_2.[48] So, the larger the GWP of a gas, the more that gas warms the Earth. GWPs enable the emissions estimates of different gases to be compared through a common unit of measure. While the typical time period employed for GWPs is 100 years, the 20-year GWP is sometimes used as an alternative because it emphasizes the impact of gases with shorter lifetimes, such as methane (CH_4). None of the EISs and only one of the EAs provides quantitative emissions estimates based on two different GWPs. The Oil and Gas Parcel Sale, December 11, 2018 (Montana) EA provides direct and indirect emissions estimates according to both the 20-year GWP and the 100-year GWP.

Alternatives and Mitigation

[48] US Environmental Protection Agency, Greenhouse Gas Emissions: Understanding Global Warming Potentials, *available at* https://www.epa.gov/ghgemissions/understanding-global-warming-potentials.

At minimum, environmental reviews must include a "no action" alternative in addition to the proposed action. However, certain EISs and EAs also compare additional alternatives.

Of the nine 2017-2018 fossil fuel production EISs, four (44%) qualitatively compare GHG emissions across the range of proposed alternatives, four (44%) quantitatively compare GHG emissions between alternatives, and one does not compare GHG emissions between alternatives whatsoever.

Some EISs and EAs discuss mitigation measures to reduce or eliminate GHG emissions from the proposed action. Some reviews contain overlap between the discussion of alternatives and mitigation measures, in particular when the agency is considering a lower-emitting alternative. Five out of nine fossil fuel extraction EISs (56%) identify possible mitigation measures to reduce GHG emissions, and only three out of nine (33%) commit to implementing GHG mitigation measures. The three EISs that commit to GHG mitigation measures are the Nanushuk Project (onshore oil), the Normally Pressured Lance Natural Gas Development Project, and the Federal Coal Lease Modifications COC-1362 & COC-67232. The Nanushuk Project commits to "[a]voidance and minimization measures and BMPs for the reduction of GHG emissions and climate change impacts includ[ing] unit fuel combustion efficiency, waste heat recovery, management of flaring and venting, compliance with applicable federal requirements for reducing and minimizing fugitive CH_4 emissions, and management of construction and operations to minimize overall GHG emissions."[49] In addition, the Normally Pressured

[49] Army Corps of Engineers, Nanushuk Project, Pages 3-29 to 3-30.

Lance Natural Gas Development Project states that "[p]er the portion of [B]LM's Methane and Waste Prevention Rule that is already in effect, operators are required to submit Waste Minimization Plans with their application for permit to drill (APD) requests. Beyond this requirement, GHGs are minimized through applicant committed measures, which become requirements in the ROD."[50] Notably, however, BLM (the lead agency) claims that it cannot require additional GHG mitigation measures beyond the existing Methane Waste Prevention Rule because GHG emissions are not a "regulated pollutant with an ambient standard or significance threshold."[51] The Federal Coal Lease Modifications COC-1362 & COC-67232 describes efforts taken by the applicant to reduce methane leakage and notes, "[t]he West Elk Mine is taking steps to reduce methane emissions outside of the mitigation measures described in this EIS. MCC is a participant in EPA's Coalbed Methane Outreach Program, which is a voluntary program with the goal to reduce methane emissions from coal mining activities."[52]

The majority of the EAs do not compare GHG emissions estimates from the proposed action and reasonable alternatives. Most provide only GHG emissions estimates of the proposed action and the alternative of no action. Two of the EAs (20%) disclose quantitative GHG estimates for one alternative in addition to the proposed action. One of the EAs (10%) includes GHG estimates for three alternatives. None of the EAs identify or assess mitigation measures or reasonable alternatives to avoid or minimize GHG

[50] BLM, Normally Pressured Lance Natural Gas Development Project, Appendix P Page 43.
[51] BLM, Normally Pressured Lance Natural Gas Development Project, Appendix P Page 43.
[52] USFS, Federal Coal Lease Modifications COC-1362 & COC-67232, §2.3.7.

emissions. Further, none of the EAs make a commitment to implementing GHG mitigation measures.

Overall, the agencies do not appear to be taking extensive measures to require applicants to undertake GHG mitigation. Most of the EISs and EAs do not contain GHG mitigation measures and those that do rely primarily on existing federal regulations and voluntary efforts by the applicants rather than new conditions or stipulations imposed by the agency for individual projects.

Significance

NEPA requires federal agencies to assess the significance of proposals' impacts. However, agencies do not always reach a firm conclusion as to whether impacts are significant, particularly when reviewing the impacts of GHG emissions. As employed in the regulations implementing NEPA, the term "significantly" necessitates considerations of intensity and context as according to the factors specified in 40 CFR § 1508.27.[53]

There is very little discussion of the significance of GHG emissions in the 2017-2018 fossil fuel extraction EISs. Seven out of the nine EISs (78%) do not discuss the significance of project GHG emissions. The Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth 2 Development Project FSEIS asserts that the significance of the project emissions cannot be determined. The lead agency, BLM, states that "[c]limate change is by its very nature a cumulative global problem, and no single project or action contributes a significant amount of greenhouse gases when compared to global

[53] 40 CFR § 1508.27.

greenhouse gas emissions."[54] One can infer that BLM views emissions from this proposal as insignificant, but the agency is not explicit. As the Council on Environmental Quality (CEQ) writes in their handbook, *Considering Cumulative Effects Under the National Environmental Policy Act*, "[e]vidence is increasing that the most devastating environmental effects may result not from the direct effects of a particular action, but from the combination of individually minor effects of multiple actions over time."[55]

Of the ten EAs, six (60%) explicitly discuss the significance of GHG emissions. As a whole, the agencies' decisions to produce EAs rather than EISs as their NEPA documentation demonstrate the conclusion that the proposed projects' environmental impacts were determined to be not significant and thus their GHG emissions were determined to be not significant. As noted above, agencies issued EAs and FONSIs for these proposals despite estimating that these ten projects alone would contribute between 640 and 668 million metric tons of CO_2e, approximately one-tenth of the GHG emissions of the entire United States, and some of the individual proposals are anticipated to generate hundreds of millions of tons of CO_2e (see Table 1).

Another method of evaluating the significance of GHG emissions is by comparison of project emissions to total emissions on global, national or state scales. The Alton Coal Tract Lease is the only EIS to provide an explicit conclusion on the significance of GHG emissions. The EIS finds that the resultant emissions would not be significant as the project would represent "0.00023% of the global emissions, an insignificant fraction of

[54] BLM, Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth 2 Development Project FSEIS, Page 306.
[55] Council on Environmental Quality, *Considering Cumulative Effects Under the National Environmental Policy Act,* Section 1: Introduction to Cumulative Effects Analysis1 1 (1997), *available at* https://ceq.doe.gov/docs/ceq-publications/ccenepa/sec1.pdf

that total."[56] Nine of the ten EAs (90%) compare project emissions to total emissions at global, national or state levels and conclude that emissions would be relatively small. Additionally, four of the ten EAs (40%) conclude that it is impossible to assess the significance of emissions due to uncertainty or a lack of quantitative thresholds. An example of the terminology employed to assert uncertainty is found in the December 2018 Competitive Oil and Gas Lease Sale (Nevada). The EA states that, "[a]lthough this EA presents a quantified estimate of potential GHG emissions associated with reasonably foreseeable oil and gas development, there is significant uncertainty in GHG emission estimates due to uncertainties with regard to eventual production volumes and variability in flaring, construction, transportation, and end uses."[57]

Cumulative Impacts Across Multiple Leasing Decisions

NEPA regulations define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR ~ 1508.7)."[58] Out of the nine EISs, two (22%) quantitatively disclose cumulative GHG impacts, two (22%) offer qualitative disclosure, and five (56%) do not provide a discussion of cumulative emissions. Two EISs, the Western Energy Company's Rosebud Mine Area FEIS and Federal Coal Lease Modifications COC-1362 & COC-67232, quantitatively disclose

[56] BLM, Alton Coal Tract Lease, Appendix L Page 100.
[57] BLM, December 2018 Competitive Oil and Gas Lease Sale (Nevada), Page 30.
[58] CEQ, *Considering Cumulative Effects Under NEPA,* Executive Summary, Page v, *available at* https://ceq.doe.gov/docs/ceq-publications/ccenepa/exec.pdf.

cumulative GHG impacts from multiple fossil fuel leasing decisions in the project area. The EISs disclose emissions from current and continuing mining operations as well as projected emissions from the proposed projects. The two 2017-2018 EISs for oil drilling in the Gulf of Mexico both qualitatively discuss cumulative emissions and tier to the 2016 PEIS for Outer Continental Shelf drilling, which quantitatively discloses cumulative emissions for multiple leasing decisions in the Gulf of Mexico.

None of the EISs discuss cumulative emissions from multiple leasing decisions in the state of the proposed project. In regard to the EAs, four of the ten (40%) provide quantitative cumulative emissions from fossil fuel extraction within the management area or locale in which the proposal is located. Two of the ten EAs (20%) estimate cumulative emissions from fossil fuel leasing at the state level and two of the EAs (20%) estimate cumulative emissions from fossil fuel leasing at the national level. On the national scale, two of the ten EAs (20%) provide quantitative discussions for cumulative emissions from all fossil fuel extraction.

Social Cost of Carbon (SCC)

First developed in 2009 by an Obama-era federal working group, the SCC measures the full costs of emitting one ton of carbon dioxide into the atmosphere, accounting for damage to public health, infrastructure, and any other harm to human society.[59] The SCC is currently a significant component of federal environmental policy,

[59] Scientific American, Should the Social Cost of Carbon be Higher?, *available at* https://www.scientificamerican.com/article/should-the-social-cost-of-carbon-be-higher.

applied frequently in cost-benefit analyses to evaluate potential projects or environmental regulations.

Among the reviewed EISs, only one, concerning the Liberty Development and Production Plan, discloses the social cost of GHG emissions from the proposed project within the text of the EIS. The Gulf of Mexico OCS Oil and Gas Lease Sales 2017-2022 and Gulf of Mexico OCS Lease Sale SEIS do not directly disclose the social cost of GHGs. However, the Gulf of Mexico OCS Oil and Gas Lease Sales 2017-2022 EIS references a technical report supplementing Outer Continental Shelf Oil and Gas Leasing Program: 2017-2022 EIS, issued in 2016, which does disclose it. The Federal Coal Lease Modifications COC-1362 & COC-67232 EIS does not disclose the social cost of GHGs from the proposed project but claims that an EIS for the Colorado Roadless Rule discloses it.

The other five EISs do not disclose the social cost of GHG emissions from the proposed projects and typically include "boilerplate" language. Justifications from the agencies often state that NEPA does not require cost-benefit analysis for projects and that it would be unfair to quantify the social cost of GHG emissions without explicitly quantifying the social benefits of fossil fuel extraction and use.[60] Some EISs also cited President Trump's Executive Order 13783 entitled "Promoting Energy Independence and Economic Growth,"[61] issued on March 28, 2017, to defend not disclosing SCC.

None of the EAs evaluated discuss the SCC. To support the lack of disclosure of the social cost of GHG emissions, five of the ten EAs contain boilerplate language asserting

[60] *See e.g. Bureau of Land Management,* Alton Coal Tract Lease, *available at* https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=253488.
[61] US White House, Presidential Executive Order on Promoting Energy Independence and Economic Growth, Issued on March 28, 2017, *available at* https://www.whitehouse.gov/presidential-actions/presidential-executive-order-promoting-energy-independence-economic-growth/.

that the SCC is not an appropriate tool for disclosing GHG impacts in NEPA reviews. The South Fork Federal Coal Lease Modifications and Environmental Assessment contains a pertinent example of this language. The EA states:

> The use of the SCC protocol was not expanded for the South Fork Federal Coal Lease modifications for a number of reasons. Most notably, this action is not a rulemaking for which the SCC protocol was originally developed. Second, on March 28, 2017, the President issued Executive Order 13783 which, among other actions, withdrew the Technical Support Documents upon which the protocol was based and disbanded the earlier Interagency Working Group on Social Cost of Greenhouse Gases… [T]here is no Executive Order requirement to apply the SCC protocol to project decisions. Further, NEPA does not require a cost-benefit analysis (40 CFR § 1502.23), although NEPA does require consideration of 'effects' that include 'economic' and 'social' effects (40 CFR § 1508.8(b). Without a complete monetary cost-benefit analysis, which would include the social benefits of the proposed action to society as a whole and other potential positive benefits, inclusion solely of a SCC cost analysis would be unbalanced, potentially inaccurate, and not useful in facilitating an authorized official's decision.[62]

To rationalize the lack of disclosure of the social cost, agencies provide similar statements in many of the EISs and EAs. As quoted above, one frequently cited argument is that because NEPA does not require a cost-benefit analysis, the inclusion of the SCC protocol alone would be ineffective and unhelpful. However, this argument is misplaced.

[62] OSMRE, South Fork Federal Coal Lease Modifications and Environmental Assessment, Page B-19.

The SCC is a valuable tool for cost-benefit analysis, but also helps disclose the nature and extent of the environmental and public health impacts of a proposed project.

III: Conclusion

While the majority of EISs and EAs surveyed include some disclosure of projects' direct and indirect GHG emissions, most of the environmental reviews lack a rigorous analysis of the significance of those emissions or the cumulative impacts of federal fossil fuel leasing in the aggregate. At the most basic level, all of the EISs either disclose direct and indirect project emissions or tier to a PEIS that does so. All of the EAs disclose direct emissions quantitatively and eight of ten (80%) disclose indirect emissions quantitatively, with an additional EA offering a qualitative discussion of indirect emissions. Variance exists in agencies' methodologies for calculating emissions. Among some of the EISs analyzed, agencies calculate net emissions including market impacts from fossil fuel production. In other instances, agencies calculate only gross emissions.

Among the reviewed documents, agencies largely forego opportunities to commit to mitigation measures for GHG emissions, account for the significance of these emissions, or consider the environmental and public health costs associated with greenhouse gas emissions from the projects. The majority of EISs evaluated do not discuss the significance of GHG emissions nor disclose cumulative emissions from multiple leasing decisions in the project area. In regard to the body of EAs, the agencies' decision to produce EAs as NEPA documentation affirms the conclusion that effects were determined to be insignificant. Less than half (40%) of the EAs explicitly evaluate the

significance of GHG emissions in light of the factors specified in the NEPA regulations. Few of the EISs and none of the EAs disclose SCC in relation to GHG emissions from the proposed projects and most reiterate the same arguments for the lack of disclosure. In summary, while federal agencies typically disclose gross GHG project emissions, more often than not, they neglect to more deeply analyze climate change impacts.