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Evaluating the Effects of Fossil Fuel Supply Projects on Greenhouse Gas Emissions and Climate Change Under NEPA

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EVALUATING THE EFFECTS OF FOSSIL FUEL SUPPLY PROJECTS ON GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE UNDER NEPA

MICHAEL BURGER* & JESSICA WENTZ**

ABSTRACT

Despite the high certainty of our looming climate catastrophe, fossil fuel production and consumption, and the greenhouse gas emissions that result, are increasing. In the United States, fossil fuel production reached record levels in 2018, and oil and gas pipelines are being constructed at an unprecedented pace. The National Environmental Policy Act (“NEPA”) provides the legal framework for the federal government to evaluate the climate impacts of these supply projects, such as leasing public lands and approving pipelines and export terminals. Yet, while federal agencies have begun to analyze how such projects impact climate change there are major inconsistencies in agency practice as well as questions about the accuracy and integrity of these assessments. Some agencies are seeking to avoid any meaningful analysis of GHG emissions, others are downplaying the significance of GHG impacts, others are claiming that the impacts are too uncertain to inform the agency’s decision. There is no programmatic analysis that evaluates the cumulative effects of U.S. fossil fuel policies. The result is a patchwork of project-level analyses that provides fragments of useful information.

Evaluating the Effects of Fossil Fuel Supply Projects on Greenhouse Gas Emissions and Climate Change under NEPA argues that agencies are too often short-changing the public by seeking to limit the scope of their environmental assessments and to elide the central question of the significance of fossil fuel supply projects, and that more comprehensive

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analyses are necessary in order to draw meaningful conclusions about the effect of government decision-making on fossil fuel use and climate change. After a brief introduction, Part I provides a statutory and factual context. Parts II and III examine recent trends in environmental review and NEPA litigation; analyze nuanced questions of the scope and significance of fossil fuel supply projects' climate change impacts, the assumptions and analytical techniques that have factored and should factor into NEPA analysis, as well as the core question of whether and to what extent NEPA requires agencies to look at the cumulative effects of multiple fossil fuel leasing and transportation approvals; and propose best practices for agencies seeking to inform themselves and the public about the climate impacts of our nation's fossil fuel decisions. This Article concludes in the last few paragraphs.

INTRODUCTION	425
I. BACKGROUND	429
A. <i>Thinking Critically About Fossil Fuel Supply and Climate Policy</i>	431
B. <i>Federal Authority Over Fossil Fuel Extraction and Transport</i>	433
C. <i>NEPA Requirements for Assessing Impacts of Fossil Fuel Supply Projects</i>	435
1. NEPA Procedures and Documentation Types	437
2. Scope of Analysis: Actions, Impacts, and Alternatives.	438
a. Scope of Impacts	438
b. Scope of Actions.	439
c. Scope of Alternatives	441
3. Significance and Mitigation	442
D. <i>Evolving Federal Policy and Practice on Fossil Fuels and NEPA Reviews</i>	444
1. Policy Developments Pertaining to Fossil Fuel Approvals and NEPA Reviews.	444
2. Trends in NEPA Practice	449
II. THE REQUIRED SCOPE OF GHG EMISSIONS DISCLOSURE FOR FOSSIL FUEL SUPPLY PROJECTS	454
A. <i>Upstream and Downstream Emissions from Fossil Fuel Supply Projects</i>	455
1. Upstream and Downstream Emissions as Indirect Impacts	455
a. Fossil Fuel Extraction.	457

2020]	THE EFFECTS OF FOSSIL FUEL SUPPLY PROJECTS	425
	<i>B. Fossil Fuel Transportation</i>	465
	1. Upstream and Downstream Emissions as Effects of Connected Actions	473
	<i>C. Cumulative Emissions from Fossil Fuel Leasing and Transport Approvals</i>	476
	1. Cumulative Emissions as Cumulative Impacts	477
	2. Cumulative Emissions as Impacts of Cumulative and Similar Actions	482
III.	THE ADEQUACY OF GHG EMISSIONS ANALYSIS FOR FOSSIL FUEL SUPPLY PROJECTS	488
	<i>A. Energy Market Impacts and Net Emissions</i>	489
	1. Fossil Fuels and “Perfect Substitution”	490
	2. Energy Market Analysis and GHG Emissions	497
	<i>B. Significance of GHG Emissions</i>	505
	1. Agencies Must Take a “Hard Look” at the Full Scope of GHG Emissions	506
	2. Agencies Must Use Sound Technical Assumptions When Measuring the Severity of the Emissions Impact	509
	3. Significance Must Be Assessed in Light of Regulatory Criteria	511
	4. Agencies Must Conduct Balanced Assessments of Costs and Benefits	519
	<i>C. Alternatives and Mitigation to Address GHG Impacts</i>	523
	CONCLUSION	527

INTRODUCTION

The world is at a critical juncture in the fight against climate change. When the Paris Agreement was adopted in 2015, the nations of the world agreed that we must limit global warming to “well below” 2°C or preferably 1.5°C above pre-industrial temperatures, recognizing that this would significantly reduce the risks and impacts of climate change.¹ But the window of opportunity for meeting these targets is quickly closing.

¹ U.N. Framework Convention on Climate Change, *Adoption of the Paris Agreement*, U.N. Doc. FCCC/CP/2015/L.9/Rev.1, annex I, art. 2 (Dec. 12, 2015).

In 2018, the Intergovernmental Panel on Climate Change (“IPCC”) published a report in which it found that global greenhouse gas (“GHG”) emissions must be reduced by nearly 50 percent by 2030 and reach net zero levels by 2050 to have a reasonable chance of meeting the 1.5°C target.² Reducing emissions at this speed and scale would require massive and unprecedented changes in energy infrastructure and most critically a rapid phase out of fossil fuels. Indeed, the vast majority of known fossil fuel reserves must be left unused to have a chance of meeting the Paris Agreement targets.³

Despite widespread agreement on the need for immediate and far-reaching action, global GHG emissions and fossil fuel consumption continue to increase and the world remains on track to significantly exceed 2°C of warming.⁴ While many jurisdictions have enacted demand-side policies aimed at regulating the end-use of fossil fuels,⁵ far less attention has been given to supply-side policies aimed at limiting the production of fossil fuels and the expansion of infrastructure intended to transport those fuels to markets. To the contrary, governments continue to authorize and even subsidize the development of new fossil fuel reserves as well as the expansion of fossil fuel transport infrastructure.⁶ This is the

² IPCC, *Summary for Policymakers*, in GLOBAL WARMING OF 1.5°C, AN IPCC SPECIAL REPORT ON THE IMPACTS OF GLOBAL WARMING OF 1.5°C ABOVE PRE-INDUSTRIAL LEVELS AND RELATED GREENHOUSE GAS EMISSION PATHWAYS, IN THE CONTEXT OF STRENGTHENING THE GLOBAL RESPONSE TO THE THREAT OF CLIMATE CHANGE, SUSTAINABLE DEVELOPMENT, AND EFFORTS TO ERADICATE POVERTY (V. Masson-Delmotte et al. eds., 2018).

³ GREG MUTTITT ET AL., *THE SKY'S LIMIT: WHY THE PARIS CLIMATE GOALS REQUIRE A MANAGED DECLINE OF FOSSIL FUEL PRODUCTION 20* (Collin Rees ed., 2016); Richard Heede & Naomi Oreskes, *Potential Emissions of CO₂ and Methane from Proved Reserves of Fossil Fuels: An Alternative Analysis*, 36 GLOBAL ENVTL. CHANGE 12, 17 (2016); Christophe McGlade & Paul Ekins, *The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2 °C*, 517 NATURE 187, 187 (2015).

⁴ Nina Chestney, *Climate policies put world on track for 3.3C warming: study*, REUTERS (Dec. 11, 2018), <https://www.reuters.com/article/us-climate-change-accord-warming/climate-policies-put-world-on-track-for-3-3c-warming-study-idUSKBN10A0Z2> [<https://perma.cc/V5ZU-F5ZY>]; Kyla Mandel, *World 'not on track' to stop 1.5 degrees of global warming warns UN Secretary General*, THINKPROGRESS (May 12, 2019), <https://thinkprogress.org/world-not-on-track-to-stop-dangerous-climate-change-warns-un-secretary-general-58797036970f/> [<https://perma.cc/276H-QLBX>]; *2011 Warming Projections*, CLIMATE ACTION TRACKER, <https://climateactiontracker.org/global/temperatures> [<https://perma.cc/2E7C-86TQ>].

⁵ EPA, *CUTTING POWER SECTOR CARBON POLLUTION : STATE POLICIES AND PROGRAMS* 8, 25, 32 (2016); David Roberts, *It's time to think seriously about cutting off the supply of fossil fuels*, VOX (May 31, 2018), <https://www.vox.com/energy-and-environment/2018/4/3/17187606/fossil-fuel-supply> [<https://perma.cc/9NKP-SF53>].

⁶ The United States and other governments also continue to subsidize fossil fuels through

case in the United States, where fossil fuel production reached record levels in 2018,⁷ and where oil and gas pipelines have been constructed at an unprecedented pace.⁸ There is a pressing need for the United States and other governments to re-evaluate their position on fossil fuel supply infrastructure in light of the growing threat of climate change.

In the United States, the National Environmental Policy Act (“NEPA”) provides the legal framework whereby the federal government must evaluate the climate impacts of fossil fuel leasing and transport proposals to make informed decisions about whether and how to proceed with these proposals.⁹ Driven by litigation and public pressure, federal agencies have analyzed how fossil fuel supply projects affect fossil fuel use and GHG emissions in some of their NEPA reviews, but there are major inconsistencies in agency practice as well as questions about the accuracy and integrity of these assessments. In some instances, agencies have sought to avoid any meaningful analysis of GHG emissions, downplaying the significance of GHG impacts, or claiming that the impacts are too uncertain to inform the agency’s decision about whether and how to proceed with individual fossil fuel leasing or transportation proposals. At the same time, the federal government has never conducted a programmatic analysis to evaluate the cumulative effects of its leasing decisions or transport approvals on fossil fuel use and GHG emissions. The result is a patchwork of project-level NEPA documentation that provides only pieces of insight on how federal decisions about fossil fuel supply infrastructure affect fossil fuel use and GHG emissions.

policies such as tax breaks for fossil fuel exploration and low royalty rates for fossil fuels produced on public lands. See David Coady et al., *Global Fossil Fuel Subsidies Remain Large: An Update Based on Country-Level Estimates* 23, 35 (IMF, Working Paper No. 19/89, 2019).

⁷ EIA, APRIL 2019 MONTHLY ENERGY REVIEW 3 (2019), <https://www.eia.gov/totalenergy/data/monthly/archive/00351904.pdf> [<https://perma.cc/H2K8-7YJF>]; EIA, ANNUAL ENERGY OUTLOOK 2019, 12, 16 (2019), <https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf> [<https://perma.cc/X6AK-2CSL>].

⁸ The United States is outpacing any other country in terms of pipeline development: over 50 percent of all oil and gas pipelines in preconstruction or construction stages are located in the United States. See TED NACE ET AL., GLOBAL ENERGY MONITOR, PIPELINE BUBBLE: NORTH AMERICA IS BETTING OVER \$1 TRILLION ON A RISKY FOSSIL INFRASTRUCTURE BOOM 3–5 (2019), https://globalenergymonitor.org/wp-content/uploads/2019/04/GFITPipelineBubble_2019_v6.pdf [<https://perma.cc/KZ85-J2QA>]; *Global Fossil Project Tracker*, GREEN INFO.NETWORK, https://greeninfo-network.github.io/fossil_tracker/ [<https://perma.cc/47MS-D5XM>] (last visited Dec. 3, 2019).

⁹ National Environmental Policy Act, 42 U.S.C. § 4321 (2012); *Summary of the National Environmental Policy Act*, EPA, <https://www.epa.gov/laws-regulations/summary-national-environmental-policy-act/> [<https://perma.cc/8RCE-SJXB>] (last updated Aug. 15, 2019).

Litigation has played a major role in prompting more thorough analysis of GHG emission impacts.¹⁰ Our 2017 article, *Downstream and Upstream Greenhouse Gas Emissions: The Proper Scope of NEPA Review*, analyzed whether NEPA required agencies to account for emissions from activities that occur “upstream” or “downstream” on the fossil fuel supply chain as indirect effects of proposed projects, and concluded that it does.¹¹ Here, we focus on recent trends in environmental review and NEPA litigation and examine some of the more nuanced questions of scope and significance, related to agencies’ assumptions and analytical techniques, as well as the core question of whether and to what extent NEPA requires agencies to look at the cumulative effects of multiple fossil fuel leasing and transportation approvals. We argue that agencies too often short-change the public by seeking to limit the scope of their environmental assessments and to elide the question of significance, and that more comprehensive analyses are necessary in order to draw meaningful conclusions about the effect of government decision-making on fossil fuel use and climate change.

In our view, full compliance with NEPA’s requirements matters. Critics may contend that NEPA is merely a “paper tiger” in that it imposes significant procedural obligations without any substantive requirement to mitigate or avoid adverse environmental impacts.¹² But the NEPA review process can lead to improved environmental decision-making, particularly when the statute’s procedural mandates are fully implemented and enforced.¹³ The disclosure of environmental impacts makes an agency

¹⁰ There is a growing body of research on what NEPA requires in this context. *See, e.g.*, Michael Burger, *A Carbon Fee as Mitigation for Fossil Fuel Extraction On Federal Lands*, 42 COLUM. J. ENVTL. L. 295, 313, 326 (2017); Arnold W. Reitze, Jr., *The Role of NEPA in Fossil Fuel Resource Development and Use in the Western United States*, 39 B.C. ENVTL. AFF. L. REV. 283, 285 (2012); Jessica Wentz, *Assessing the Impacts of Climate Change on the Built Environment: A Framework for Environmental Reviews*, 45 ENVTL. L. REV. 11,015, 11,017, 11,019 (2015). *See also* James W. Coleman, *Beyond the Pipeline Wars: Reforming Environmental Assessment of Energy Transport Infrastructure*, 2018 UTAH L. REV. 119, 121–22, 126–27 (2018); James W. Coleman, *Pipelines & Power-Lines: Building the Energy Transport Future*, 80 OHIO ST. L.J. 263, 266, 304 (2019).

¹¹ Michael Burger & Jessica Wentz, *Downstream and Upstream Emissions: The Proper Scope of NEPA Review*, 41 HARV. ENVTL. L. REV. 109, 181 (2017).

¹² *See, e.g.*, Michael C. Blumm & Keith Mosman, *The Overlooked Role of the National Environmental Policy Act in Protecting the Western Environment: NEPA in the Ninth Circuit*, 2 WASH. J. ENVTL. L. & POL’Y 193, 198 (2012).

¹³ *See id.* at 195–99; Paul Stanton Kibel, *The Paper Tiger Awakens: North American Environmental Law After the Cozumel Reef Case*, 39 COLUM. J. TRANSNAT’L L. 395, 409, 425 (2001); Raymond Laws, *NEPA and the Northern Integrated Supply Project: Wielding the*

accountable for those impacts, thus placing pressure on the agency to mitigate or avoid adverse impacts which cannot be justified by the project's benefits or are otherwise unacceptable to the public. This appears to be true for the fossil fuel supply proposals discussed in this Article: the fact that agencies have tried to limit their GHG disclosures and downplay the significance of GHG emissions suggests that they are concerned about the potential consequences of such disclosure. But this practice cannot continue. The federal government needs to assess and disclose the emissions impact of the fossil fuel production and transportation infrastructure that it authorizes, not only to support informed decision-making, but also to ensure that the public has access to this information and can meaningfully engage with policymakers on appropriate supply-side policies for fossil fuels.

Part I provides a factual and legal background. It discusses the rationale for critically evaluating fossil fuel supply projects in the context of climate change goals and policies, explains the scope of U.S. federal authority over fossil fuel extraction and transport proposals, summarizes NEPA requirements that are relevant to the U.S. government's review of such proposals, and reviews the evolution of federal practice and policy on fossil fuel development and NEPA reviews. Part II summarizes and synthesizes recent case law on the scope of GHG emissions that must be disclosed as effects of fossil fuel supply projects under NEPA, focusing on emissions which qualify as indirect effects, cumulative effects, and effects of related actions. Part III examines new and emerging legal questions that pertain to GHG emissions analysis under NEPA, particularly the reasonableness of agency assumptions and findings related to (i) the effect of fossil fuel supply projects on energy markets and fossil fuel end-use, and the net emissions impact of the proposal in light of those market impacts; (ii) the significance of GHG emissions impacts; and (iii) the evaluation of alternatives and mitigation measures that would reduce GHG emissions. The Conclusion includes a summary of key points and recommendations on how agencies can best satisfy their NEPA obligations in this context.

I. BACKGROUND

The Intergovernmental Panel on Climate Change's ("IPCC") special report on *Global Warming of 1.5°C* and the U.S. Global Change Research

Paper Tiger' in the Tenth Circuit, 27 COLO. NAT. RESOURCES, ENERGY & ENVTL. L. REV. 101, 102, 108, 111 (2016).

Program's ("USGCRP") *Fourth National Climate Assessment* recognize that rapid reductions in greenhouse gas emissions will be needed to limit global warming to 1.5°C or "well below" 2°C.¹⁴ Even if we attain this ambitious goal, the world will still experience a wide range of significant and adverse impacts from climate change, but the potential impacts of 2°C or 3°C of warming would be dramatically worse.¹⁵ But despite broad scientific consensus on this imperative and national commitments to address climate change, GHG emissions and atmospheric concentrations continue to increase, breaking records in both 2018 and 2019.¹⁶

Globally, fossil fuel combustion remains the dominant source of anthropogenic GHG emissions as well as the primary driver of recent emission increases.¹⁷ The growth in fossil fuel emissions actually accelerated in 2017 and 2018 notwithstanding the adoption of the Paris Agreement.¹⁸ In the United States, fossil fuel emissions increased by 2.7 percent in 2018, the second-largest margin in twenty years, after three years of decline.¹⁹ This increase occurred despite a steep drop in coal use because the reductions in coal-related emissions were more than offset by significant increases in oil and gas consumption.²⁰

There is still a very narrow window of time in which action could be taken to meet the Paris Agreement. One study found that it may still be possible to limit global warming to 1.5°C if all fossil fuel-powered infrastructure (power plants, factories, vehicles, ships, and planes) are replaced by zero-carbon alternatives at the end of their useful lives and no new fossil fuel-powered infrastructure is constructed, but the world

¹⁴ IPCC, GLOBAL WARMING OF 1.5°C, AN IPCC SPECIAL REPORT ON THE IMPACTS OF GLOBAL WARMING OF 1.5°C ABOVE PRE-INDUSTRIAL LEVELS AND RELATED GREENHOUSE GAS EMISSION PATHWAYS, IN THE CONTEXT OF STRENGTHENING THE GLOBAL RESPONSE TO THE THREAT OF CLIMATE CHANGE, SUSTAINABLE DEVELOPMENT, AND EFFORTS TO ERADICATE POVERTY v–vi (V. Masson-Delmotte et al. eds., 2018); USGCRP, FOURTH NATIONAL CLIMATE ASSESSMENT VOL. II: IMPACTS, RISKS, AND ADAPTATION IN THE UNITED STATES 1351 (D.R. Reidmiller et al. eds., 2018).

¹⁵ IPCC, *supra* note 14.

¹⁶ INT'L ENERGY AGENCY, GLOBAL ENERGY & CO₂ STATUS REPORT 2018 3 (2018); *Global Carbon Budget 2018*, GLOBAL CARBON PROJECT (Dec. 5, 2018), <https://www.globalcarbonproject.org/carbonbudget> [<https://perma.cc/996P-F43T>]; *Global Monthly Mean CO₂*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., <https://www.esrl.noaa.gov/gmd/ccgg/trends/global.html> [<https://perma.cc/2CW2-56XN>] (last visited Dec. 3, 2019).

¹⁷ See sources cited *supra* note 16.

¹⁸ Travis Houser et al., *Final US Emissions Estimates for 2018*, RHODIUM GRP. (May 31, 2019), <https://rhg.com/research/final-us-emissions-estimates-for-2018/> [<https://perma.cc/QG94-TGN8>].

¹⁹ *Id.*

²⁰ *Id.*

would likely exceed that target if this phase-out is delayed until 2030.²¹ This is in line with the IPCC's findings that limiting global warming to 1.5°C would require “rapid and far-reaching” changes across all sectors, particularly the energy and transport sectors.²²

A. *Thinking Critically About Fossil Fuel Supply and Climate Policy*

To accelerate the fossil fuel phase-out, many advocate for supply-side policies aimed at limiting fossil fuel extraction and the expansion of infrastructure to transport fuels to end-users—the central message to governments being to “keep it in the ground.”²³ These advocacy efforts are grounded in scientific research on fossil fuels and the global carbon budget, most notably a 2015 study which found that the world would need to leave at least 80 percent of the remaining known fossil fuel reserves unused in order to have a 50 percent chance of limiting global warming to 2°C.²⁴ It is not just undeveloped reserves that need to be left in the ground: another study on developed reserves found that the potential carbon emissions from the oil, gas, and coal in the world's currently operating fields and mines would take us beyond 2°C if those reserves are fully exploited, and that developed reserves of oil and gas alone are enough to push the world beyond 1.5°C of warming even if coal is phased out immediately.²⁵

Governments have been slow to enact supply-side restrictions, in part because fossil fuel extraction and trade are viewed as central to economic development and energy security, and in part because supply-side actions are sometimes viewed as ineffective in a global marketplace.²⁶ One critical question is whether government approvals of new fossil fuel supply projects are fundamentally at odds with the imperative to phase out fossil fuel use. The answer to this question may seem obvious, but different projects may warrant different conclusions: a proposal

²¹ Christopher J. Smith et al., *Current Fossil Fuel Infrastructure Does Not Yet Commit Us to 1.5 °C Warming*, 10 NATURE COMM. 101 (2019).

²² IPCC, *supra* note 14.

²³ See generally Kate Schimel, *How the Keep it in the Ground movement came to be*, HIGH COUNTRYNEWS (July 19, 2016), <http://www.hcn.org/articles/how-the-keep-it-in-the-ground-movement-gained-momentum> [https://perma.cc/G4M2-ZXWT].

²⁴ McGlade & Ekins, *supra* note 3, at 187.

²⁵ MUTTITT ET AL., *supra* note 3.

²⁶ For a more in-depth analysis of why supply-side policies have not been widely used to date, see Michael Lazarus & Harro van Asselt, *Fossil Fuel Supply and Climate Policy: Exploring the Road Less Taken*, 150 CLIMATIC CHANGE 1, 1–2 (2018); Michael Lazarus et al., *Supply-Side Climate Policy: The Road Less Taken* 14 (Stockholm Environmental Institute, Working Paper No. 2015-13, 2015).

to exploit new coal reserves may be totally at odds with climate goals, whereas a natural gas pipeline might be justified if there is sound evidence that it will reduce coal use among end-users—but such a justification would need to be supported by an analysis of whether there are alternatives to coal and gas for meeting energy demand, such as renewables or efficiency improvements, and whether the investment in new natural gas infrastructure will “lock in” reliance on natural gas rather than carbon-free energy substitutes. Upon careful assessment, decision makers may find that the expansion of any fossil fuel production or transportation infrastructure is irrational and imprudent in light of the need to immediately and rapidly phase out fossil fuel use and the prospect that such investments may result in stranded assets within the next several decades.²⁷

A related question is whether supply-side restrictions are both effective at reducing fossil fuel use and in alignment with other policy goals. Here, again, the analysis is complicated. Critics have argued that such policies may be ineffective, economically suboptimal, and may threaten energy security.²⁸ But there is a growing body of research suggesting that supply-side policies can and should be integrated into the portfolio of government responses to climate change.²⁹ For example, one study found that “restrictive supply-side policy instruments (targeting fossil fuels) have numerous characteristic economic and political advantages over otherwise similar restrictive demand-side instruments (targeting greenhouse gases)” including: (i) low administrative and transaction costs, (ii) higher abatement certainty, (iii) comprehensive within-sector coverage, (iv) advantageous price/efficiency effects, (v) the mitigation of infrastructure “lock-in” risks, and (vi) mitigation of the “green paradox”—that is, the risk that policies reducing the value of fossil fuel resources will cause an increase in consumption of those resources.³⁰ Other studies have found that constraining fossil fuel production and supply can significantly increase fuel prices

²⁷ For more information on stranded assets, see BEN CALDECOTT ET AL., STRANDED ASSETS: A CLIMATE RISK CHALLENGE (Ana R. Rios ed., 2016); J.F. Mercure et al., *Macroeconomic Impact of Stranded Fossil Fuel Assets*, 8 NATURE CLIMATE CHANGE 588 (2019); NACE ET AL., *supra* note 8.

²⁸ See, e.g., Michael A. Levi, *The Environmental and Climate Stakes in Arctic Oil Drilling*, COUNCIL ON FOREIGN REL. BLOG (May 13, 2015), <https://www.cfr.org/blog/environmental-and-climate-stakes-arctic-oil-drilling> [<https://perma.cc/W97S-Q2U2>] (arguing that supply-side restrictions on fossil fuel supply in one jurisdiction are ineffective due to global trade in fossil fuels).

²⁹ Fergus Green & Richard Denniss, *Cutting With Both Arms of the Scissors: The Economic and Political Case for Restrictive Supply-Side Climate Policies*, 150 CLIMATIC CHANGE 73, 78 (2018).

³⁰ *Id.* at 73.

thereby reducing consumption vis-à-vis lower carbon energy sources.³¹ In particular, a 2018 study found that ceasing the issuance of new leases for fossil fuel extraction on federal lands and waters in the United States would reduce global CO₂ emissions by an estimated 280 million tons annually by 2030, which would be comparable to the effects of other major climate policies adopted or considered by the Obama administration.³²

B. *Federal Authority Over Fossil Fuel Extraction and Transport*

The U.S. federal government oversees the leasing of coal, oil, and gas reserves on public lands, which contain more than one quarter of the country's known fossil fuel reserves.³³ The Department of Interior ("DOI"), Bureau of Land Management ("BLM"), U.S. Forest Service ("USFS"),

³¹ Peter Erickson & Michael Lazarus, *Would Constraining US Fossil Fuel Production Affect Global CO₂ Emissions? A Case Study of US Leasing Policy*, 150 CLIMATIC CHANGE 29, 34 (2018) [hereinafter Erickson & Lazarus]; Taran Fæhn et al., *Climate Policies in a Fossil Fuel Producing Country—Demand Versus Supply Side Policies*, 38 ENERGY J. 77, 83 (2017); Filip Johnson et al., *The Threat to Climate Change Mitigation Posed by the Abundance of Fossil Fuels*, 19 CLIMATE POL'Y 258, 266 (2018); Lazarus & van Asselt, *supra* note 26, at 5; Philippe Le Billon & Berit Kristoffersen, *Just Cuts for Fossil Fuels? Supply-Side Carbon Constraints and Energy Transition*, 0 ENV'T & PLAN. 1, 4 (2019); Georgia Piggot et al., *Swimming Upstream: Addressing Fossil Fuel Supply Under the UNFCCC*, 18 CLIMATE POL'Y 1189, 1190 (2018); Jianliang Wang et al., *The Implications of Fossil Fuel Supply Constraints on Climate Change Projections: A Supply-Side Analysis*, 86 FUTURES 58, 66–67 (2017); Peter Erickson, *Confronting Carbon Lock-In: Canada's Oil Sands*, STOCKHOLM ENV'T INST. 7 (2018); Peter Erickson & Michael Lazarus, *How Limiting Oil Production Could Help California Meet its Climate Goals*, STOCKHOLM ENV'T INST. 2 (2018); *see* Cleo Verkuijl et al., *Aligning Fossil Fuel Production with the Paris Agreement*, STOCKHOLM ENV'T INST. 3 (Mar. 2018); Lazarus et al., *supra* note 26, at 6. Much of this research focuses on the effects of constraining fossil fuel production, but imposing such constraints on fossil fuel transportation infrastructure is also a supply-side approach which would affect fuel prices, demand, and consumption. *See* U.S. DEPT OF ENERGY, NATURAL GAS INFRASTRUCTURE IMPLICATIONS OF INCREASED DEMAND FROM THE ELECTRIC POWER SECTOR v–vi (Feb. 2015), https://www.energy.gov/sites/prod/files/2015/02/f19/DOE%20Report%20Natural%20Gas%20Infrastructure%20V_02-02.pdf [<https://perma.cc/4QVS-CRJS>] (discussing how natural gas transmission constraints can increase prices); LESSLEY GOUDARZI & FRANCES WOOD, ONLOCATION.INC, THE IMPACTS OF RESTRICTING FOSSIL FUEL ENERGY PRODUCTION i (Apr. 2017) (finding that a U.S. policy consisting of restrictions on both extraction and transport projects would result in economy-wide emission reductions approximately 10 percent greater than a reference case without that policy).

³² Erickson & Lazarus, *supra* note 31, at 36–37.

³³ Approximately one-third of known coal reserves, one quarter of crude oil reserves, and one quarter of natural gas reserves are located on public lands and managed by the federal government. MARC HUMPHRIES, U.S. CRUDE OIL AND NATURAL GAS PRODUCTION IN FEDERAL AND NONFEDERAL AREAS 2 (June 22, 2016), <https://fas.org/sgp/crs/misc/R42432.pdf> [<https://perma.cc/DZ72-UG6J>]; ROBERT H. NELSON, THE USE AND MANAGEMENT OF FEDERAL COAL 9 (2017).

Bureau of Ocean and Energy Management (“BOEM”), and Office of Surface Mining Reclamation and Enforcement (“OSM”) all share authority over fossil fuel leasing on public lands and act as lead agencies in NEPA reviews for these activities.³⁴ The Mineral Leasing Act and other statutes grant broad discretion to these agencies to decide how and whether to lease federal lands for fossil fuel development, and the agencies can and must account for environmental effects when making decisions about the location and amount of lands made available for leasing.³⁵

The federal government also has considerable authority over the construction of infrastructure that is used to transport fossil fuels to domestic and international markets. The Federal Energy Regulatory Commission (“FERC”) has authority over the siting, construction, and operation of interstate natural gas pipelines, liquefied natural gas (“LNG”) export terminals, and associated infrastructure such as liquefaction facilities.³⁶ In addition, Department of Energy (“DOE”) authorization is required for LNG exports.³⁷ The Surface Transportation Board (“STB”) has exclusive licensing authority over the construction and operation of rail lines, which are the primary mode of transport for coal.³⁸ The federal government does not have equivalent authority over the construction of oil pipelines—however, such pipelines frequently require federal approvals that trigger NEPA requirements.³⁹ The statutes authorizing these agencies to approve this infrastructure also require consideration of environmental impacts and the responsible agencies have broad discretion to deny approvals based on environmental impacts or other issues pertaining to the public interest.⁴⁰

³⁴ Which agency oversees fossil fuel leasing depends on where the leasing occurs. For a more detailed discussion, see ADAM VANN, CONG. RESEARCH SERV., R40806, ENERGY PROJECTS ON FEDERAL LANDS: LEASING AND AUTHORIZATION 4–12 (2012); Burger & Wentz, *supra* note 11, at 116–26.

³⁵ See VANN, *supra* note 34, at 4–12; Burger & Wentz, *supra* note 11, at 116–26.

³⁶ LAWRENCE R. GREENFIELD, AN OVERVIEW OF THE FEDERAL ENERGY REGULATORY COMMISSION AND FEDERAL REGULATION OF PUBLIC UTILITIES 10 (June 2018), <https://www.ferc.gov/about/ferc-does/ferc101.pdf> [<https://perma.cc/G62N-8U76>].

³⁷ *Liquefied Natural Gas (LGE)*, DEP’T ENERGY, <https://www.energy.gov/fe/science-innovation/oil-gas/liquefied-natural-gas> [<https://perma.cc/R2G3-RVWA>] (last visited Dec. 3, 2019).

³⁸ 49 U.S.C. § 10901 (2012) (establishing that a person may construct or add to railroad lines only if authorized by the Board).

³⁹ See, e.g., 33 U.S.C. § 1344(a) (2012) (requiring a permit under Clean Water Act section 404 for any project that involves the discharge of dredged and/or fill materials into navigable waters, tributaries, and adjacent wetlands); see also 33 U.S.C. § 403 (2012) (requiring a Rivers and Harbors Act section 10 permit for projects that involve construction and/or dredge and fill activities in the navigable waters of the United States).

⁴⁰ See Burger & Wentz, *supra* note 11, at 119–21.

C. *NEPA Requirements for Assessing Impacts of Fossil Fuel Supply Projects*

NEPA establishes a procedural framework for assessing the environmental impacts of federal proposals and using those assessments to make better-informed decisions about whether and how to proceed with those proposals.⁴¹ The statute recognizes that it is “the continuing responsibility of the Federal Government to use all practicable means” to “improve and coordinate” federal activities such that the nation may “fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.”⁴² To effectuate this policy, it requires federal agencies to prepare a detailed environmental impact statement (“EIS”) for proposals that significantly affect the quality of the human environment, in which the agency must evaluate the environmental effects of the proposal and reasonable alternatives.⁴³ The statute also establishes a Council on Environmental Quality (“CEQ”), which is responsible for issuing regulations and guidance on the implementation of NEPA.⁴⁴ The CEQ regulations and guidance are supplemented by agency-specific rules and procedures for NEPA reviews.⁴⁵

The Supreme Court has interpreted NEPA’s mandates as “essentially procedural” because NEPA does not require agencies to adopt any particular course of action based on the outcome of the review,⁴⁶ but has

⁴¹ Much has already been written on NEPA’s sweeping environmental policies and review requirements. *See, e.g.*, Ted Boling, *Making the Connection: NEPA Processes for National Environmental Policy*, 32 WASH. U. J.L. & POL’Y 313, 314–20 (2010); Bradley Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing Government’s Environmental Performance*, 102 COLUM. L. REV. 903, 909–16 (2002).

⁴² 42 U.S.C. § 4331(b) (2006).

⁴³ 42 U.S.C. § 4332(C).

⁴⁴ NEPA does not expressly state that CEQ shall develop implementing regulations for NEPA. Rather, CEQ’s authority to issue regulations under NEPA is based on the duties and functions outlined in Title II of NEPA, as well as two Executive Orders. *See* 42 U.S.C. § 4344(3) (directing CEQ to “review and appraise” federal programs and activities to determine the extent to which they fulfill the statute’s stated policy, and to make recommendations to the President with respect thereto); Exec. Order No. 11,514, 35 Fed. Reg. 4248 (Mar. 7, 1970); Exec. Order No. 11,991, 42 Fed. Reg. 26,967 (May 24, 1977). Courts have consistently deferred to CEQ’s interpretation of NEPA. *See, e.g.*, *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 355 (1989) (CEQ regulations are entitled to “substantial deference”); *see also* *Andrus v. Sierra Club*, 442 U.S. 347, 358 (1979).

⁴⁵ *Agency NEPA Implementing Procedures*, CEQ, https://ceq.doe.gov/laws-regulations/agency_implementing_procedures.html [<https://perma.cc/7AHP-7X7C>] (last visited Dec. 3, 2019).

⁴⁶ *Strycker’s Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223, 227–28 (1980); *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 588 (1978).

also recognized that NEPA serves an “action-forcing” function and its procedural mandates must be interpreted in light of its twin aims of preventing uninformed agency decisions and providing adequate disclosure to allow public participation in those decisions.⁴⁷ Thus, when assessing the adequacy of NEPA documentation, courts must consider whether an agency has overlooked or underestimated an important environmental impact that is of consequence to the public’s understanding of the proposal and the agency’s decision about whether and how to proceed with the proposal.⁴⁸

Below, we summarize NEPA procedures and some of the core requirements pertaining to the scope and adequacy of environmental reviews, highlighting areas that are of particular relevance to the analysis of fossil fuel supply projects and their contribution to climate change. We focus on the requirements outlined in CEQ regulations, as these apply to all federal projects. We also briefly touch on some aspects of CEQ’s 2016 guidance on climate change and NEPA reviews,⁴⁹ which was rescinded by President Trump,⁵⁰ as well as the new draft guidance that CEQ issued in June 2019 to take its place.⁵¹ Although the 2016 guidance is no longer in effect,⁵² it provides some useful insights into how CEQ interpreted NEPA requirements in the past and contains relatively specific instructions to agencies on how to meaningfully account for and assess the significance of GHG emissions. The 2019 draft guidance, in comparison, contains a number of provisions which appear aimed at limiting NEPA disclosures of GHG emissions and climate change impacts, but in many cases these provisions are too vague to provide meaningful direction, and in many cases merely restate existing law.⁵³

⁴⁷ *Methow Valley Citizens*, 490 U.S. at 349. *See also* *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 371 (1989) (referring to “the Act’s manifest concern with preventing uninformed action”).

⁴⁸ *Methow Valley Citizens*, 490 U.S. at 349.

⁴⁹ Memorandum from the Council of Environmental Quality on Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (Aug. 1, 2016), https://ceq.doe.gov/docs/ceq-regulations-and-guidance/nepa_final_ghg_guidance.pdf [<https://perma.cc/Y9Z7-FE46>] [hereinafter CEQ, Final Guidance Memo].

⁵⁰ Exec. Order No. 13,783, 82 Fed. Reg. 16,093 (Mar. 31, 2017).

⁵¹ CEQ, Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emission, 84 Fed. Reg. 30,097 (June 26, 2019) [hereinafter CEQ, 2019 Draft GHG Guidance].

⁵² Exec. Order No. 13,783, *supra* note 50.

⁵³ For example, the draft guidance directs agencies to quantify emissions where they are “substantial enough to warrant quantification” (presumably seeking to curtail quantification)

1. NEPA Procedures and Documentation Types

There are three types of documentation that can be used to demonstrate compliance with NEPA. The EIS is the most comprehensive form of documentation and, as provided in the statute, it is required for any major federal action that has significant environmental impacts.⁵⁴ If an agency is unsure about whether an action will have significant environmental impacts, it may prepare an environmental assessment (“EA”)—a shorter document used to identify potentially significant impacts.⁵⁵ Based on the EA, the agency must either proceed with the preparation of a full EIS or issue a finding of no significant impact (“FONSI”).⁵⁶ The regulations also permit agencies to designate categorical exclusions (“CEs”) for categories of actions which the agency has determined “do not individually or cumulatively have a significant effect on the human environment” and thus do not require preparation of an EIS or EA.⁵⁷

without providing any guidance on what is meant by “substantial enough” in this context. CEQ, 2019 Draft GHG Guidance, *supra* note 51. It also tells agencies that impacts should be “discussed in proportion to their significance” and tells agencies that they “need not give greater consideration to potential effects from GHG emissions than to other potential effects on the human environment.” *Id.* This is simply a restatement of NEPA requirements: agencies need not give greater consideration to any particular type of effect as a general matter, but they must conduct a more in-depth analysis of potentially significant impacts. For more on this topic, see Jessica Wentz, *New Draft Guidance on Climate Change and NEPA Reviews Unlikely to Significantly Affect Agency Practice or Judicial Interpretation of NEPA Obligations*, CLIMATE LAW BLOG (June 24, 2019), <http://blogs.law.columbia.edu/climatechange/2019/06/24/new-draft-guidance-on-climate-change-and-nepa-reviews-unlikely-to-significantly-affect-agency-practice-or-judicial-interpretation-of-nepa-obligations/> [<https://perma.cc/Y92G-ACPU>].

⁵⁴ 40 C.F.R. §§ 1501.7, 1502.9, 1505.2 (2019) (preparing an EIS involves three steps: a scoping phase, where public input on the scope of the review is solicited; a draft EIS which is made available for public comment; and a final EIS which is published along with a record of decision (ROD) indicating the course of action that the agency intends to take); 40 C.F.R. §§ 1501.4(b), 1501.4(e)(1) (The regulations are less explicit about the process for preparing an EA—they state that the agency “shall involve environmental agencies, applicants, and the public, to the extent practicable” when preparing EAs, and that FONSI must be made available to the affected public); 40 C.F.R. § 1506.6 (The regulations also contain some general provisions pertaining to public involvement, such as a requirement to “[m]ake diligent efforts to involve the public in preparing and implementing their NEPA procedures.”).

⁵⁵ See 40 C.F.R. § 1508.9; see also *National Environmental Policy Act Review Process*, EPA, <https://www.epa.gov/nepa/national-environmental-policy-act-review-process> [<https://perma.cc/4MU3-YGNN>] (last updated Jan. 24, 2017).

⁵⁶ 40 C.F.R. §§ 1501.4(e), 1508.13.

⁵⁷ 40 C.F.R. § 1508.4.

2. Scope of Analysis: Actions, Impacts, and Alternatives

The CEQ regulations outline the proper scope of analysis for NEPA reviews—that is, the “range of actions, alternatives, and impacts to be considered” in a single impact statement.⁵⁸

a. Scope of Impacts

First, regarding the scope of impacts, agencies must consider three types of impacts: (i) direct effects, which are “caused by the action and occur at the same time and place”; (ii) indirect effects, which are “caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable”; and (iii) cumulative effects, which result from “the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions.”⁵⁹

For proposals that involve fossil fuel supply infrastructure, direct emissions would include emissions from vehicles and equipment used to construct the infrastructure as well as emissions generated from the operation of the infrastructure (e.g., methane emissions from coal mining).⁶⁰ Indirect emissions from fossil fuel extraction proposals would include downstream emissions from the eventual transport, processing, and combustion of the produced fossil fuels, and indirect emissions from fossil fuel transport proposals would include not only downstream emissions but also upstream emissions from the production of the transported fuel.⁶¹

As for the requirement to evaluate cumulative effects—there are two ways that this could be interpreted in the context of a GHG assessment for fossil fuel supply projects. One interpretation is that the impacts of climate change (e.g., sea level rise) qualify as cumulative effects of the proposal, since these impacts will occur when the proposal’s GHG emissions are added to all other past, present, and reasonably foreseeable GHG emissions. Certainly, a general description of climate change impacts could be useful to decision makers and the public, but this type of analysis does

⁵⁸ 40 C.F.R. § 1508.25.

⁵⁹ 40 C.F.R. §§ 1508.7, 1508.8.

⁶⁰ CEQ, Final Guidance Memo, *supra* note 49.

⁶¹ See Burger & Wentz, *supra* note 11, at 142–43, 149; *infra* Part II; see also CEQ, Final Guidance Memo, *supra* note 49, at 13–14, 16. There are other emissions which may qualify as indirect effects of fossil fuel supply projects, such as the emissions from induced vehicle trips that occur offsite (e.g., worker commutes), but for the purposes of this Article we focus on upstream and downstream emissions.

not provide much insight on the specific action under review.⁶² Another interpretation, which would likely generate more useful data for decision-making on fossil fuel supply proposals, is that NEPA requires consideration of the cumulative emissions from other reasonably foreseeable actions affecting fossil fuel supply—for example, the cumulative effects analysis for a coal leasing proposal should encompass cumulative emissions from all federal coal leasing in the state, region, and/or nation. This second interpretation is consistent with the CEQ’s guidance on cumulative effects analysis which directs agencies to consider activities that are of a similar nature or that have similar environmental effects when setting boundaries for this analysis.⁶³

b. Scope of Actions

Agencies must consider three types of “related actions” when determining the scope of an EIS: connected actions, cumulative actions, and similar actions. Actions are considered “connected” if they: (i) automatically trigger other actions which may require EISs, (ii) cannot or will not proceed unless other actions are taken previously or simultaneously, or (iii) are independent parts of a larger action and depend on the larger action for their justification.⁶⁴ Such connected actions are “closely related and therefore *should* be discussed in the same impact statement.”⁶⁵ Cumulative actions are those that “when viewed with other proposed actions have cumulatively significant impacts” and like connected actions, they should be discussed in the same impact statement.⁶⁶ Similar actions are

⁶² CEQ, 2019 Draft GHG Guidance, *supra* note 51. CEQ’s 2019 revised draft guidance endorses this approach, stating that agencies may satisfy the requirement to evaluate cumulative effects by: (i) comparing the project’s GHG emissions to local, regional, national, or sector-wide emissions, and (ii) providing a qualitative summary of the effects of GHG emissions. This may be sufficient for some types of proposals. However, as discussed in Section II.B, more may be required in the context of fossil fuel supply projects. There are at least two recent decisions in which courts have required quantification of cumulative emissions from federal fossil fuel-related approvals in this context. *See WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 53 (D.D.C. 2019); *Indigenous Envtl. Network v. U.S. Dep’t of State*, 347 F. Supp. 3d 561, 590 (D. Mont. 2018) (requiring the Department of State to disclose emissions from the Alberta Clipper pipeline as part of its cumulative effects analysis for the Keystone XL pipeline).

⁶³ CEQ, CONSIDERATION OF CUMULATIVE EFFECTS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT 13 tbl. 2-1 (1997).

⁶⁴ 40 C.F.R. § 1508.25(a)(1).

⁶⁵ *Id.* (emphasis added).

⁶⁶ *Id.* § 1508.25(a)(2).

those which “have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography.”⁶⁷ The regulations state that “[a]n agency may wish to analyze these actions in the same impact statement” but that an agency “*should* do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement.”⁶⁸

The regulations also prohibit improper segmentation of proposals. One provision specifies that “[p]roposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action *shall* be evaluated in a single impact statement.”⁶⁹ Reinforcing this point the section of the regulations which deals with significance determinations states that an agency cannot break down an action into “small component parts”—or improperly segment an action—in order to avoid a determination that the action will have a significant effect on the environment.⁷⁰

There is overlap between the requirement to review “indirect impacts” and impacts from “connected actions.” Consider a situation where the federal government is simultaneously reviewing a coal lease application and a proposal to construct a railway to transport the coal from the mine to end-users (or an existing rail system). The emissions from the railway would qualify as “indirect effects” of the coal mine and vice versa, and both actions would also qualify as “connected actions” that lack independent utility and should thus be reviewed in a single NEPA document (even if two different agencies are responsible for the approvals). However, if there is no pending federal action for a connected activity, the proper approach would be to analyze the emissions from the nonfederal activity as indirect effects of the federal action.

There is also overlap between the requirement to review “cumulative effects” and the requirement to review impacts from cumulative and similar actions. For example, an agency could treat emissions from multiple fossil fuel leasing decisions as cumulative effects in the EIS for an individual leasing proposal, or it could prepare a single EIS to evaluate those leasing decisions as cumulative and/or similar actions. Again,

⁶⁷ *Id.* 1508.25(a)(3).

⁶⁸ *Id.* (emphasis added).

⁶⁹ 40 C.F.R. § 1502.4 (emphasis added).

⁷⁰ 40 C.F.R. § 1508.27(7). The regulations are not explicit about the relationship between the prohibition on improper segmentation and the requirement to consider “related actions” under section 1508.25. One plausible interpretation is that actions which qualify as “connected actions” under section 1508.25 are “related . . . closely enough to be, in effect, a single course of action.”

the best approach depends on whether there are multiple federal proposals simultaneously under review by an agency.

c. Scope of Alternatives

Finally, regarding the scope of alternatives, agencies must consider alternatives which include a no action alternative, other reasonable courses of action, and mitigation measures (not in the proposed action).⁷¹ The regulations further provide that the analysis of alternatives is the “heart of the environmental impact statement” and that this analysis “should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public.”⁷² In addition, agencies must “rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.”⁷³

In NEPA reviews for fossil fuel supply projects, the alternatives analysis can and in many cases should be used to evaluate the merits of different fossil fuel development and transportation scenarios. For example, when preparing an EIS for a resource management plan (“RMP”) under which federal lands may be opened for fossil fuel development, an agency must consider different leasing scenarios (with different acreage and levels of production) as well as different land uses and approaches to meeting energy demand (e.g., renewable energy development) in addition to the “no action” alternative.⁷⁴ This is precisely the sort of analysis that would facilitate an informed decision about the best uses of public lands.

Agencies may also compare fossil fuel production and consumption scenarios under the proposal and the no action alternative to estimate the net impact of the proposal on fossil fuel use and corresponding emissions. The underlying assumption is that energy demand will be met through other sources (energy substitutes) if the proposal is not approved, and these energy substitutes will also generate emissions when they are produced, transported, and consumed. Thus, the emissions from energy substitutes under the no action alternative can be subtracted from the proposal’s gross emissions in order to reach an estimate of net emissions.

⁷¹ 40 C.F.R. § 1508.25(b).

⁷² 40 C.F.R. § 1502.14.

⁷³ *Id.*

⁷⁴ 40 C.F.R. § 1508.25.

Alternatively, if an agency finds that there is too much uncertainty to model the effects on energy markets, it could rely on estimates of gross indirect emissions to measure the proposal's contribution to climate change.⁷⁵

3. Significance and Mitigation

The regulations also contain additional instructions on how agencies should go about analyzing environmental impacts and their significance. EISs should be “analytic rather than encyclopedic” and impacts should “be discussed in proportion to their significance.”⁷⁶ Agencies must discuss the significance of both direct and indirect effects, taking into account the context and intensity of the impact as well as other more specific considerations, such as whether the impact is highly uncertain or controversial and whether the action is related to other individually insignificant but cumulatively significant actions.⁷⁷ The regulations also address how agencies should handle missing or incomplete information about potentially significant environmental impacts, including indirect impacts. In these circumstances, agencies are required to obtain any missing information that is essential to a reasoned choice among alternatives, unless the costs of obtaining the information are exorbitant or the information is simply unavailable.⁷⁸

Finally, the regulations call for consideration of mitigation approaches for impacts that are found to be significant. “Mitigation” is defined as:

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
- (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- (d) Reducing or eliminating the impact over time by preservation and

⁷⁵ See *infra* Section III.A.

⁷⁶ 40 C.F.R. § 1502.2.

⁷⁷ 40 C.F.R. §§ 1502.16, 1508.27.

⁷⁸ 40 C.F.R. § 1502.22(b). If an agency cannot obtain the missing information due to exorbitant costs or infeasibility, it must provide: (i) a statement that such information is incomplete or unviable, (ii) a statement of the relevance of the information, (iii) a summary of existing credible scientific evidence which is relevant to evaluating environmental impacts in the absence of such information, and (iv) the agency's evaluation of such impacts based on theoretical approaches or research methods generally accepted in the scientific community. *Id.*

maintenance operations during the life of the action. (e) Compensating for the impact by replacing or providing substitute resources or environments.⁷⁹

Notably, while the regulations require *consideration* of such measures, NEPA and its implementing regulations do not contain a substantive requirement to actually implement mitigation measures for significant impacts.⁸⁰ Agencies, however, do have the authority to require mitigation of impacts as a condition of agency approvals; agencies also may require mitigation to avoid a determination of significant impacts and thereby avoid preparation of an EIS.⁸¹

No federal agency has yet established a threshold for what constitutes a “significant” GHG contribution, and the CEQ intentionally omitted such a threshold from the rescinded guidance.⁸² That guidance did, however, contain a recommendation against using comparisons to overall GHG emissions as a basis for evaluating significance:

[A] statement that emissions from a proposed Federal action represent only a small fraction of global emissions is essentially a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether or to what extent to consider climate change impacts under NEPA. Moreover, these comparisons are also not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations because this approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make a relatively small addition to global atmospheric GHG concentrations that collectively have a large impact. When considering GHG emissions and their significance, agencies should use appropriate tools and

⁷⁹ 40 C.F.R. § 1508.20.

⁸⁰ See 40 C.F.R. §§ 1508.20, 1508.25, 1508.27.

⁸¹ CEQ, Final Guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate use of Mitigated Findings of No Significant Impact, 76 Fed. Reg. 3843 (Jan. 21, 2011).

⁸² CEQ, Revised Draft Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews, 79 Fed. Reg. 77,802, 77,807, 77,809–11 (Dec. 24, 2014) [hereinafter CEQ, 2014 Revised Draft Guidance].

methodologies for quantifying GHG emissions and comparing GHG quantities across alternative scenarios. Agencies should not limit themselves to calculating a proposed action's emissions as a percentage of sector, nationwide, or global emissions in deciding whether or to what extent to consider climate change impacts under NEPA.⁸³

There is no reason that the lack of a significance threshold should prevent agencies from reaching significance determinations for GHG emissions. Agencies frequently assess the significance of other impacts in the absence of predetermined significance thresholds.⁸⁴ And even if the exact threshold of significance for GHG emissions is unknown, there are circumstances in which an action's emissions obviously surpass any reasonable metric of significance when viewed in terms of social costs.⁸⁵

D. Evolving Federal Policy and Practice on Fossil Fuels and NEPA Reviews

Federal agencies have made important progress towards meaningful evaluation and disclosure of GHG effects in NEPA reviews for fossil fuel supply projects. Litigation has played an important role in driving such disclosures, but executive policies and guidance have also helped to shape agency practice. Here, we summarize some key policy developments that occurred under the Obama and Trump administrations and discuss how federal practice in this area has evolved over the past decade.

1. Policy Developments Pertaining to Fossil Fuel Approvals and NEPA Reviews

The federal government has long supported fossil fuel production on federal lands and the expansion of fossil fuel transportation infrastructure.

⁸³ CEQ, Final Guidance Memo, *supra* note 49, at 11. In contrast, CEQ's 2019 guidance recommends that agencies compare the proposal's emissions to local, regional, national, or sector-wide emissions as part of the cumulative effects analysis. *See supra* note 62. While such comparisons can provide useful information to decision makers and the public, agencies should not rely on these exclusively for the reasons articulated in the 2016 guidance.

⁸⁴ CEQ, 2014 Revised Draft Guidance, *supra* note 82 (examples of impacts for which agencies lack quantitative significance thresholds include impacts on public health, species and ecosystems, cultural resources, recreational values, and aesthetic values).

⁸⁵ *The true cost of carbon pollution: How the social cost of carbon improves policies to address climate change*, ENVTL. DEF. FUND, <https://www.edf.org/true-cost-carbon-pollution> [<https://perma.cc/NHM6-HUFJ>] (last visited Dec. 3, 2019).

During the Obama administration, federal agencies approved new coal, oil, and gas leases, as well as numerous oil and gas pipelines and LNG export terminals.⁸⁶ During Obama's second term the administration adopted several policies that signaled decreasing support for fossil fuels. First, the administration offered fewer new leases and less acreage for coal, oil, and gas development on federal lands and waters between 2012 and 2016.⁸⁷ Second, DOI Secretarial Order 3338 established a moratorium on federal coal leasing in 2016 accompanied by a commitment to prepare a programmatic EIS ("PEIS") for the federal coal leasing program.⁸⁸ One of the key issues to be addressed in the PEIS was the effect of the program on GHG emissions (including downstream emissions) and climate change.⁸⁹

In addition to these leasing actions, the administration adopted the CEQ guidance on consideration of climate change in 2016 which, as noted above, directed agencies to account for upstream and downstream emissions in NEPA reviews for fossil fuel supply projects and to quantify those emissions where tools and data were available to do so.⁹⁰ The administration also adopted a number of other relevant policies and guidance, including federal metrics for estimating the social cost of GHG emissions,⁹¹ department- and agency-specific guidance on accounting for

⁸⁶ See, e.g., *Oil and Gas Statistics*, U.S. BUREAU LAND MGMT., tbl. 3, <https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/oil-and-gas-statistics> [<https://perma.cc/62LE-A6FZ>] (last visited Dec. 3, 2019) (BLM issued 7,297 oil and gas leases during President Obama's first term, and 3,997 oil and gas leases during his second term.).

⁸⁷ *Id.* See also *Coal Data: National Coal Statistics Table*, U.S. BUREAU LAND MGMT., <https://www.blm.gov/programs/energy-and-minerals/coal/coal-data> [<https://perma.cc/74Q5-AXF7>] (last visited Dec. 3, 2019).

⁸⁸ DEP'T OF THE INTERIOR, ORDER NO. 3338, DISCRETIONARY PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT TO MODERNIZE THE FEDERAL COAL PROGRAM 1, 8–9 (Jan. 15, 2016).

⁸⁹ U.S. BUREAU OF LAND MGMT., FEDERAL COAL PROGRAM PEIS—SCOPING REPORT, 17–23 (2017).

⁹⁰ CEQ, Final Guidance Memo, *supra* note 49. Other agencies, such as USFS and BLM, had also published or were developing their own guidance on accounting for climate change in NEPA reviews. See, e.g., *Climate Change Considerations in Project Level NEPA Analysis*, U.S. FOREST SERV. (2009), https://www.fs.fed.us/emc/nepa/climate_change/includes/cc_nepa_guidance.pdf [<https://perma.cc/M8A9-9G4X>].

⁹¹ See INTERAGENCY WORKING GRP. ON THE SOCIAL COST OF GREENHOUSE GASES, TECHNICAL SUPPORT DOCUMENT: TECHNICAL UPDATE OF THE SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866 (May 2013, revised Aug. 2016); see also INTERAGENCY WORKING GRP. ON THE SOCIAL COST OF GREENHOUSE GASES, ADDENDUM TO TECHNICAL SUPPORT DOCUMENT ON SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866: APPLICATION OF THE METHODOLOGY TO ESTIMATE THE SOCIAL COST OF METHANE AND THE SOCIAL COST OF NITROUS OXIDE (Aug. 2016) (These metrics were developed for cost-benefit analyses in rule-makings,

climate change in public land management,⁹² and guidance on compensatory mitigation for adverse impacts arising from fossil fuel development and other extractive uses of public lands.⁹³

The election of President Trump signaled a major shift in executive policy. The Trump administration made it a priority to support fossil fuel development and use under the mantra of “energy dominance.”⁹⁴ In particular, the administration has taken measures to: (i) scale up fossil fuel production on federal lands and waters by expanding the areas available for leasing and removing regulatory barriers to the issuance of leases⁹⁵ and (ii) expedite the review of pipelines and other fossil fuel transportation infrastructure.⁹⁶ These supply-side actions are paired with actions

but can also be utilized in project-level emission assessments and, as noted in Part III, some courts have required their use in the NEPA context.).

⁹² See, e.g., *Navigating the Climate Change Performance Scorecard*, U.S. FOREST SERV. (2011), <https://www.fs.fed.us/climatechange/advisor/scorecard/scorecard-guidance-08-2011.pdf> [<https://perma.cc/L4WX-V5JS>].

⁹³ See generally U.S. BUREAU OF LAND MGMT. MANUAL SECTION 1794—MITIGATION (Dec. 22, 2016); U.S. BUREAU OF LAND MGMT. MITIGATION HANDBOOK H-1794-1 (Dec. 22, 2016).

⁹⁴ See *About: Mission*, U.S. DEPT INTERIOR, <https://www.doi.gov/whoweare> [<https://perma.cc/GA7H-LLFN>] (last visited Dec. 3, 2019) (“promot[ing] energy dominance” is the first major goal outlined for DOI).

⁹⁵ See, e.g., Notice of Availability of the 2019–2024 Draft Proposed Outer Continental Shelf Oil and Gas Leasing Program and Notice of Intent to Prepare a Programmatic Environmental Impact Statement, 83 Fed. Reg. 829, 830 (Jan. 2018); *2017–2022 Outer Continental Shelf Oil and Gas Leasing: Proposed Final Program*, BUREAU OCEAN ENERGY MGMT. (Nov. 2016), <https://www.boem.gov/2017-2022-OCS-Oil-and-Gas-Leasing-PFP/> [<https://perma.cc/DU63-6T2D>]; *Coastal Plain Oil and Gas Leasing EIS*, U.S. DEPT INTERIOR (Sept. 2019), <https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage¤tPageId=152110> [<https://perma.cc/74ZQ-E897>] (In January 2018, BOEM issued a proposed National Outer Continental Shelf Oil and Gas Leasing Program for 2019–2024, which would make over 90 percent of the outer continental shelf (“OCS”) available for future oil and gas exploration and development. In comparison with the 2019–2024 Draft, the 2017–2022 offshore leasing program (which would be superseded by this new program) put 94 percent of the OCS off-limits to oil and gas development. The Draft Proposed Program (“DPP”) includes forty-seven potential lease sales in twenty-five of twenty-six planning areas—which, according to DOI, is the largest number of lease sales ever proposed for the OCS five-year lease schedule. The administration also took measures to expand leasing areas in the Arctic, and in December 2018, BLM issued a proposal for a Coastal Plain Oil and Gas Leasing Program in the Arctic National Wildlife Refuge (“ANWR”) which would make up to 1.5 million acres of the ANWR open for oil and gas development. In March 2019, BLM lifted restrictions on mineral development on approximately nine million acres of sage grouse habitat, opening these previously protected areas for oil and gas leasing and other extractive uses. Many of these actions were challenged in court, and litigation was, at the time of this writing, still pending.).

⁹⁶ See JESSICA WENTZ & MICHAEL GERRARD, SABIN CTR. FOR CLIMATE CHANGE LAW,

aimed at lifting “downstream” restrictions on fossil fuel use, such as the emission standards for power plants and motor vehicles originally promulgated under the Obama administration.⁹⁷

Some of the Trump administration’s major executive actions affecting NEPA reviews for fossil fuel supply projects include:

- The issuance of multiple executive orders directing agencies to streamline approvals for fossil fuel leasing and energy infrastructure;⁹⁸
- The revocation of the CEQ’s 2016 guidance on climate change,⁹⁹ and promulgation of new draft guidance;¹⁰⁰
- The revocation of the federal metrics developed for the social cost of carbon (SC-CO₂), methane (SC-CH₄) and nitrous oxide (SC-N₂O);¹⁰¹ and
- The termination of the programmatic review of the federal coal leasing and the moratorium that had been put in place pending that review.¹⁰²

Acting pursuant to these directives, DOI and its constituent agencies also adopted more specific policies and guidance aimed at expediting and curtailing reviews of coal, oil, and gas leases. For example, BLM issued an instruction memorandum to its field offices on January 31, 2018, which establishes a BLM policy “to simplify and streamline the leasing process [for oil and gas] to alleviate unnecessary impediments and burdens, to expedite the offering of lands for lease, and to ensure quarterly oil and gas lease sales are consistently held.”¹⁰³ The instruction

PERSISTENT REGULATIONS: A DETAILED ASSESSMENT OF THE TRUMP ADMINISTRATION’S EFFORTS TO REPEAL FEDERAL CLIMATE PROTECTIONS (2019); *see also* U.S. DEP’T OF THE INTERIOR, ECONOMIC REPORT: FY20175 (Oct. 19, 2018), <https://doi.sciencebase.gov/doidv/files/2017/pdf/FY%202017%20Econ%20Report.pdf> [<https://perma.cc/XJA2-ZKP7>].

⁹⁷ WENTZ & GERRARD, *supra* note 96, at 39–40.

⁹⁸ Exec. Order No. 13,868, 84 Fed. Reg. 15,495 (Apr. 10, 2019); Exec. Order No. 13,867, 84 Fed. Reg. 15,491 (Apr. 10, 2019); Exec. Order No. 13,807, 82 Fed. Reg. 40,463 (Aug. 24, 2017); Exec. Order No. 13,795, 82 Fed. Reg. 20,815 (May 3, 2017).

⁹⁹ Exec. Order No. 13,783, *supra* note 50.

¹⁰⁰ CEQ, 2019 Draft GHG Guidance, *supra* note 51.

¹⁰¹ Exec. Order No. 13,783, *supra* note 50.

¹⁰² DEP’T OF THE INTERIOR, ORDER NO. 3348, CONCERNING THE FEDERAL COAL MORATORIUM 1 (Mar. 29, 2017).

¹⁰³ Instruction Memorandum No. 2018-034: Updating Oil and Gas Leasing Reform from the Deputy Director of the Bureau of Land Mgmt. to all field officials 1 (Jan. 31, 2018),

memorandum reduces the amount of time that BLM field offices have to review environmental impacts and receive public feedback. It limits the time frame for parcel review for a specific lease sale to six months and limits the amount of time allotted for public protest of lease sales to ten days after notice is posted.¹⁰⁴ It also seeks to eliminate opportunities for public review and disclosure of environmental impacts from oil and gas development on public lands.¹⁰⁵

These policy changes have resulted in more fossil fuel production on federal lands. DOI announced that the revenue generated from oil and gas lease sales on public lands in 2018 was nearly triple that of the next highest grossing year on record.¹⁰⁶ Granted, coal production and use continued to decline in 2018, but the emissions reduction benefits of declining coal use were more than offset by increased emissions from oil and gas, and both oil and gas production are projected to increase significantly over the next decade.¹⁰⁷ The administration also approved several major coal mining leases that could affect coal prices and consumption in the years ahead.¹⁰⁸ This situation seems untenable at a time when fossil fuel use needs to be phased out rapidly. The duration of these leasing plans and anticipated lifetime of these transportation projects range from ten years to several decades or more—considerably longer than the time frame in which fossil fuels need to be phased out.¹⁰⁹

<https://www.blm.gov/policy/im-2018-034> [<https://perma.cc/WH4L-RVVL>] [hereinafter BLM, Memo No. 2018-034]. The U.S. Forest Service has also signaled its intent to modify its regulations in order to streamline and expedite the issuance of oil and gas permits on National Forest lands. *See* Oil and Gas Resources, 83 Fed. Reg. 46,458 (Sept. 13, 2018).

¹⁰⁴ BLM, Memo No. 2018-034, *supra* note 103.

¹⁰⁵ *Id.*

¹⁰⁶ Press Release, U.S. Dep't of the Interior, Energy Revolution Unleashed: Interior Shatters Previous Records with \$1.1 Billion in 2018 Oil and Gas Lease Sales (Feb. 6, 2019), <https://www.doi.gov/news/energy-revolution-unleashed-interior-shatters-previous-records-11-billion-2018-oil-and-gas> [<https://perma.cc/4YN6-TXDH>].

¹⁰⁷ Kate Wheeling, *U.S. Oil Production is Set to Rise As Experts Say Fossil Fuels Need to be Phased Out*, PAC. STANDARD (Jan. 16, 2019), <https://psmag.com/environment/us-oil-production-is-set-to-rise-as-experts-say-fossil-fuels-need-to-be-phased-out> [<https://perma.cc/5942-UUZK>].

¹⁰⁸ Press Release, U.S. Dep't of the Interior, The War on Coal is Over: Interior Announces Historic Coal Projects in Utah (Feb. 14, 2019), <https://www.doi.gov/pressreleases/war-coal-over-interior-announces-historic-coal-projects-utah> [<https://perma.cc/W4ZF-LWEH>].

¹⁰⁹ Press Release, U.S. Dep't of the Interior, Energy Revolution Unleashed: Interior Shatters Previous Records with \$1.1 Billion in 2018 Oil and Gas Lease Sales (Feb. 6, 2019), <https://www.doi.gov/news/energy-revolution-unleashed-interior-shatters-previous-records-11-billion-2018-oil-and-gas> [<https://perma.cc/5Y3X-JGPB>].

It is within this policy context that federal agencies must now conduct NEPA reviews for fossil fuel supply projects. As discussed below, agency practice on GHG analysis and disclosures has improved in many respects—in particular, agencies are more transparent about the downstream emissions from combustion of fossil fuels in NEPA reviews for fossil fuel leasing proposals—and there has not been significant “backtracking” during the Trump administration. This is a testament to the power of litigation and the importance of court decisions. The Trump administration’s 2019 revised draft guidance on climate change and NEPA reviews is unlikely to significantly affect agency practice or judicial review in this context, in part for reasons noted above (the guidance is very vague and primarily a restatement of existing law) and in part because it would only be entitled to Skidmore deference.¹¹⁰

2. Trends in NEPA Practice

Between 2009 and 2016, federal agencies began to account for GHG emissions in NEPA reviews for land management plans and leases authorizing fossil fuel extraction from federal lands and waters.¹¹¹ However, many of these proposals were approved without a meaningful assessment of indirect emissions from the transport, processing and use of the produced fuels, or cumulative emissions from multiple leasing decisions.¹¹² Some agencies did recognize that downstream emissions—particularly emissions from the combustion of produced fuels—qualified as “indirect effects” and quantitative disclosures of combustion emissions became increasingly common during this period.¹¹³ But practice varied considerably both across and within agencies, resulting in inconsistencies across NEPA documentation.¹¹⁴

In some documents, agencies would argue that authorizing fossil fuel production on federal lands would have no actual effect on fossil fuel

¹¹⁰ When a court reviews agency guidance documents, the agency’s interpretation is entitled to “respect proportional to its power to persuade” in light of the agency’s “thoroughness, logic, and expertness, its fit with prior interpretations, and any other sources of weight.” *United States v. Mead Corp.*, 533 U.S. 218, 235 (2001) (citing *Skidmore v. Swift & Co.*, 323 U.S. 134, 140 (1944)).

¹¹¹ See Burger & Wentz, *supra* note 11, for a more detailed discussion of how federal agencies were accounting for indirect GHG emissions in their NEPA documentation during this period.

¹¹² *Id.*

¹¹³ *Id.*

¹¹⁴ *Id.*

consumption and downstream emissions because other sources of coal, oil, or gas would be extracted and used at the same rates if the federal proposals were not approved (an argument that is often referred to as “perfect substitution”).¹¹⁵ In effect, agencies were claiming that the GHG impact would be identical under both the proposed action and the no action alternative. The problem with this approach was that it ignored potential effects of production projects on fossil fuel prices and demand.

There were similar inconsistencies in NEPA reviews of fossil fuel transportation infrastructure. The State Department, DOE, and U.S. Army Corps of Engineers (“USACE”) discussed upstream and downstream emissions as potential indirect effects in some of the NEPA documentation prepared for these projects.¹¹⁶ However, FERC—which conducted the largest number of reviews due to its authority over natural gas pipelines and export terminals—consistently maintained that upstream and downstream emissions did not qualify as indirect effects of its approvals because: (i) the approvals were not the legally relevant cause of those emissions, and (ii) even if there was a causal relationship, the emissions were too speculative to estimate.¹¹⁷ Granted, other agencies made similar arguments in some of their NEPA documentation (and when defending those documents in court)¹¹⁸ but none had as firm a policy on the issue as FERC.

Even with the inconsistencies in agency practice, there was a clear trend towards greater disclosure of indirect emissions during this period.¹¹⁹ This up-tick in federal disclosures was driven, at least in part, by litigation. By 2017, over a dozen lawsuits had been filed challenging the approval of fossil fuel leasing and pipeline proposals because the lead agency failed to adequately consider upstream and/or downstream greenhouse gas emissions in its NEPA review.¹²⁰ The critical question in most of these cases was whether such upstream and downstream emissions qualified as indirect effects of these proposals.¹²¹ In early decisions involving NEPA reviews for fossil fuel leasing, courts made it clear that downstream emissions from the consumption of the fossil fuels that would be extracted under the lease qualified as indirect effects under NEPA, and that agencies should quantify those emissions wherever tools and

¹¹⁵ *Id.*

¹¹⁶ *See, e.g.*, U.S. DEP’T OF STATE, FINAL SUPPLEMENTAL EIS, KEYSTONE XL (2014) § 1.4 (“Market Analysis”); Burger & Wentz, *supra* note 11, at Part II.

¹¹⁷ *See* Burger & Wentz, *supra* note 11, at 137.

¹¹⁸ *See id.*

¹¹⁹ *See id.*

¹²⁰ *Id.*

¹²¹ *Id.*

data were available to do so.¹²² Courts also rejected perfect substitution arguments as a basis for ignoring downstream emissions from leasing.¹²³ The issue was not so clearly resolved in early decisions involving fossil fuel transportation projects—some courts required disclosure of upstream and/or downstream emissions; others did not.¹²⁴ That issue continues to be litigated.¹²⁵

The litigation has led to a shift in agency practice, at least for proposals involving fossil fuel production. For the most part, agencies overseeing fossil fuel production no longer argue perfect substitution as the grounds for ignoring downstream emissions.¹²⁶ Instead, agencies sometimes provide a quantitative estimate of downstream emissions (often limited to combustion emissions) accompanied by a qualitative statement about how the actual (net) emissions from the proposal will be much lower as a result of energy substitution under the no action alternative.¹²⁷ In that context, agencies may conclude that it is impossible to measure the actual effect of the proposal on climate change, and thus there is no significance determination or discussion of mitigation measures.¹²⁸ Another approach, more common for major leasing proposals, is to use energy market models to compare emissions from fossil fuels produced under the proposal with emissions from energy substitutes under the no action alternative to generate an estimate of net emissions.¹²⁹ While this approach seems reasonable in theory, there are potential problems in practice. The model results are dependent on parameters (i.e., assumptions about

¹²² *See id.*

¹²³ Burger & Wentz, *supra* note 11, at 152.

¹²⁴ *Id.*

¹²⁵ *See infra* Section II.A. At the time of this writing, there is no case invalidating an EIS for failure to consider upstream emissions, but there are cases upholding EISs because they properly accounted for upstream emissions. Whether quantification is required under NEPA depends on whether tools and data are available to do so.

¹²⁶ *See* Burger & Wentz, *supra* note 11, at 152.

¹²⁷ *Id.*

¹²⁸ *See, e.g.*, U.S. FOREST SERV., SUPPLEMENTAL FINAL ENVIRONMENTAL IMPACT STATEMENT, FEDERAL COAL LEASE MODIFICATIONS COC-1362 & COC-67232 at 128 (2017):

All that can be gleamed from this analysis is that relative to the alternatives themselves, the no action produces the least amount of incremental GHG increases. This does not however translate directly into climate change impact reductions due to the complexities involved with estimating the coal supply market responses to current demand, current fuel substitution transitions to non-coal fuels (beyond the scope of this analysis), and how other governments and sectors of the global economy implement or fail to implement GHG emissions reduction strategies.

¹²⁹ Burger & Wentz, *supra* note 11, at 179.

energy resources, price elasticity, and demand) that are highly uncertain and can be manipulated to achieve an intended result.¹³⁰ But these are not necessarily insurmountable problems. Agencies can address uncertainty by using multiple scenarios in their energy market analysis (e.g., with different assumptions about energy prices and elasticity) and they can address concerns about integrity and data manipulation by being transparent about the assumptions underpinning their analysis.

As for transportation infrastructure: starting in 2016, FERC started to include increasing amounts of information on upstream and downstream GHG emissions in its pipeline orders.¹³¹ This appeared to be driven by the Obama administration's policy and guidance on NEPA reviews as well as case law requiring disclosure of downstream emissions in other contexts. But FERC placed caveats on this information and analysis—for example, in one EIS where FERC quantified downstream emissions from a pipeline approval pursuant to a D.C. Circuit Court order, FERC claimed that it could not use the quantified downstream GHG emission estimates to evaluate the proposal “[b]ecause the No Action Alternative could result in lesser, equal, or greater GHG emissions” than the scenario in which the pipeline is approved.¹³² FERC has also asserted that natural gas pipelines would likely decrease emissions (due to fuel switching from coal to gas) without conducting any analysis to support this conclusion.¹³³ In 2018, FERC announced that it would no longer even quantify downstream or upstream emissions for most pipeline orders because the effect of pipeline approvals on upstream and downstream emissions was not reasonably foreseeable and therefore not an indirect or cumulative effect that must be evaluated under NEPA.¹³⁴

¹³⁰ *Id.*

¹³¹ See *Dominion Transmission, Inc.*, 163 FERC ¶ 61,128 (LaFleur, dissenting).

¹³² FERC, FINAL SUPPLEMENTAL EIS, SOUTHEAST MARKET PIPELINES PROJECT, EIS 0279F at 9 (2018).

¹³³ See, e.g., Petitioners' Joint Opening Brief at 20, *Allegheny Def. Project v. FERC*, No. 17-1098 (D.C. Cir. Mar. 9, 2018).

¹³⁴ *Dominion Transmission, Inc.*, *supra* note 131; Gavin Bade, *Divided FERC restricts climate impacts in pipeline reviews*, UTILITY DIVE (May 18, 2018), <https://www.utilitydive.com/news/divided-ferc-restricts-climate-impacts-in-pipeline-reviews/523892/> [<https://perma.cc/7448-HSAX>]. FERC came under considerable scrutiny for this policy and many of its pipeline approvals are currently being challenged in court. Moreover, two of the five FERC commissioners—Cheryl LaFleur and Richard Glick—dissented with the order establishing the policy on the grounds that downstream and upstream emissions do qualify as indirect or cumulative impacts of pipeline approvals. *Dominion Transmission, Inc.*, *supra* note 131. Commissioner Glick characterized FERC's position as a “remarkably narrow view of its responsibilities under NEPA” and Commissioner LaFleur

There are also some trends which have become prevalent in NEPA reviews for all types of fossil fuel supply proposals. One example is that federal agencies are refusing to disclose social costs of emissions on the grounds that such a cost disclosure is neither required by NEPA nor helpful to decision makers.¹³⁵ Another example relates to significance determinations for GHG emissions.¹³⁶ The NEPA documentation for both production and transportation projects often contains no discussion (or only a limited discussion) of the significance criteria outlined in the regulations.¹³⁷ Instead, the significance “analysis” may entail a comparison of emissions to state, national, or global totals (contrary to the recommendations in the rescinded CEQ guidance), a statement about uncertainty due to energy market substitution, and/or a statement about how there is no significance threshold for GHG emissions and thus no way of defining significance. Based on this cursory analysis, agencies either conclude that emissions are insignificant or do not reach a conclusion on the matter.¹³⁸ We are not aware of *any* EIS in which an agency has concluded that emissions from fossil fuel production or transportation qualify as a “significant” impact, even in the context of proposals that would generate millions of tons of GHGs.¹³⁹ It also appears that agencies are heavily relying on EAs and FONSI for oil and gas lease approvals, and hundreds (possibly thousands) of oil and gas leases have been approved based on FONSI in the past two years.¹⁴⁰

As federal policies and agency practice have changed, so too has the focus of litigation on the adequacy of the GHG analysis for fossil fuel

noted that FERC’s position was in direct conflict with the D.C. Circuit’s interpretation of what NEPA required. *Id.* Commissioner Cheryl LaFleur announced that she would depart from the commission’s policy and consider upstream and downstream emissions in her review and consider the broad climate impacts of new natural gas infrastructure when voting on whether to approve new projects. *Id.*; *see also* ROMANY WEBB, SABIN CTR. FOR CLIMATE CHANGE LAW, CLIMATE CHANGE, FERC, AND NATURAL GAS PIPELINES: THE LEGAL BASIS FOR CONSIDERING GREENHOUSE GAS EMISSIONS UNDER SECTION 7 OF THE NATURAL GAS ACT 4 (2019) (finding that FERC rarely considers climate change effects when deciding whether to approve pipeline projects).

¹³⁵ WEBB, *supra* note 134, at 30.

¹³⁶ *Id.*

¹³⁷ *Id.*

¹³⁸ *Id.* at 44.

¹³⁹ *See* MADELEINE SIEGEL & ALEXANDER LOZNAK, SABIN CTR. FOR CLIMATE CHANGE LAW, SURVEY OF GREENHOUSE GAS CONSIDERATIONS IN FEDERAL ENVIRONMENTAL IMPACT STATEMENTS AND ENVIRONMENTAL ASSESSMENTS FOR FOSSIL FUEL-RELATED PROJECTS, 2017–2018 at 2–3 (2019).

¹⁴⁰ *See id.* at 15–16.

supply projects. There are still many lawsuits involving an agency's failure to disclose certain categories of emissions—particularly indirect emissions, cumulative emissions, and emissions from related actions. We discuss these cases involving the proper scope of analysis in Part II. There are also a number of lawsuits that address questions related to the mode or adequacy of analysis—e.g., whether the analysis itself is technically sound, supported by the record, and consistent with the requirements of NEPA regulations. The critical questions include:

- What are reasonable assumptions about energy market impacts, energy substitutions, the “net” effect of the proposal on fossil fuel production and consumption (and the corresponding emissions)?
- How should an agency go about assessing the significance of emissions? Must agencies use tools such as social cost estimates or a global carbon budget to better understand the severity of the emissions impact?
- What is required in terms of assessing alternatives and mitigation for GHG emissions?

We discuss these questions on the mode of analysis in Part III.

II. THE REQUIRED SCOPE OF GHG EMISSIONS DISCLOSURE FOR FOSSIL FUEL SUPPLY PROJECTS

In this section we propose answers to various aspects of two key questions: (1) To what extent and under what circumstances must agencies account for upstream and downstream emissions from other activities on the supply chain for the fuels that will be produced or transported as a result of federal approvals? and (2) To what extent must agencies account for cumulative emissions of multiple fossil fuel leasing and/or transportation approvals in their NEPA reviews for fossil fuel supply projects? Most of the case law to date focuses on whether such emissions qualify as indirect or cumulative impacts of federal proposals, but some decisions grapple with other aspects of NEPA, such as whether multiple fossil fuel–related approvals constitute “related actions” that must be reviewed jointly, and whether the required scope of disclosure is different when an agency has prepared an EA and has found no significant impact on GHG emissions.

A. *Upstream and Downstream Emissions from Fossil Fuel Supply Projects*

There are two regulatory requirements that may provide the basis for evaluating disclosure of upstream and/or downstream emissions in this context: the requirement to evaluate indirect effects and the requirement to evaluate the effects of connected actions. We discuss each approach in turn.¹⁴¹

1. Upstream and Downstream Emissions as Indirect Impacts

Indirect effects are “caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.”¹⁴² They include “growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.”¹⁴³ A sufficient causal connection exists if the proposed action is a cause-in-fact of the impact (i.e., the impact would not occur but for the proposed action) and if there is a “reasonably close causal relationship akin to proximate cause in tort law.”¹⁴⁴ An impact is “reasonably foreseeable” if it is “sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision.”¹⁴⁵ Examples of factors relevant to this analysis include the likelihood of the impact, the utility of the information to the decision maker, and whether the absence of such information now would foreclose its consideration later.¹⁴⁶

¹⁴¹ There are also some cases in which agencies, parties, and courts have treated these as “cumulative emissions”—but characterizing upstream and downstream emissions as cumulative effects fails to account for the causal relationship between the production of fossil fuels or expansion of transport infrastructure and the eventual use of those fuels. As discussed below, courts have found that this causal relationship is sufficient to characterize these emissions as indirect rather than cumulative effects, and this appears to be the better approach in light of that causal connection.

¹⁴² 40 C.F.R. § 1508.8(b) (2011).

¹⁴³ *Id.*

¹⁴⁴ U.S. Dep’t of Transp. v. Pub. Citizen, 541 U.S. 752, 754 (2004) (citing Metro. Edison Co. v. People Against Nuclear Energy, 460 U.S. 766, 774 (1983)) (internal citations omitted).

¹⁴⁵ City of Shoreacres v. Waterworth, 420 F.3d 440, 453 (5th Cir. 2005) (quoting Sierra Club v. Marsh, 976 F.2d 763, 767 (1st Cir. 1992)); see also Mid States Coal. for Progress v. Surface Transp. Bd., 345 F.3d 520, 549 (8th Cir. 2003).

¹⁴⁶ Sierra Club v. Marsh, 976 F.2d 763, 768 (1st Cir. 1992) (citing Sierra Club v. Marsh 769 F.2d 868, 878 (1st Cir. 1985)); see also Massachusetts v. Watt, 716 F.2d 946, 952–53 (1st Cir. 1983).

Although agencies are not required to conduct a “crystal-ball” inquiry to identify potential impacts, they must use “[r]easonable forecasting and speculation” to evaluate impacts even when there is uncertainty about the nature and timing of those impacts.¹⁴⁷ Moreover, the NEPA regulations impose an affirmative obligation on agencies to procure information regarding reasonably foreseeable impacts when possible.¹⁴⁸ The agency must also respond to information when it is provided through public comments.¹⁴⁹ In determining whether an agency has violated NEPA by omitting information from its analysis, a court must consider the “usefulness of any new potential information to the decisionmaking process.”¹⁵⁰

Some courts have used the analogy of “links in a chain” to describe the scope of indirect effects that should be reviewed in NEPA documents.¹⁵¹ This analogy is helpful for thinking about the scope of NEPA analysis for GHG emissions from fossil fuel supply projects. The various stages of fossil fuel production, transportation, processing, and consumption can also be thought of as “links in a chain” which are inextricably connected and should thus be analyzed together.¹⁵²

¹⁴⁷ *Scientists’ Inst. for Pub. Info., Inc. v. U.S. Atomic Energy Comm’n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973) (noting that the courts must therefore “reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as ‘crystal ball inquiry’”); *see also* *City of Davis v. Coleman*, 521 F.2d 661, 675 (9th Cir. 1975) (“The nature and extent of development which the project will induce is still uncertain. Davis’ fears may be exaggerated. But currently available information and plain common sense indicate that it was hardly ‘reasonable’ for CDHW or FHWA to conclude, without further study, that the environmental impact of the proposed interchange will be insignificant.”).

¹⁴⁸ 40 C.F.R. § 1502.22 (2012).

¹⁴⁹ *Mid States Coal. for Progress*, 345 F.3d at 537.

¹⁵⁰ *U.S. Dep’t of Transp. v. Pub. Citizen*, 541 U.S. 752, 767 (2004).

¹⁵¹ *Sylvester v. U.S. Army Corps of Eng’rs*, 884 F.2d 394, 400 (9th Cir. 1989):

Environmental impacts are in some respects like ripples following the casting of a stone in a pool. The simile is beguiling but useless as a standard. So employed it suggests that the entire pool must be considered each time a substance heavier than a hair lands upon its surface. This is not a practical guide. A better image is that of scattered bits of a broken chain, some segments of which contain numerous links, while others have only one or two. Each segment stands alone, but each link within each segment does not[.]

See also *Ocean Mammal Inst. v. Cohen*, 164 F.3d 631 (9th Cir. 1998); *Fla. Audubon Soc’y v. Bentsen*, 94 F.3d 658, 668–70 (D.C. Cir. 1996); *Border Power Plant Working Grp. v. U.S. Dep’t of Energy*, 260 F. Supp. 2d 997, 1013 (S.D. Cal. 2003); *Ocean Mammal Inst. v. Cohen*, No. 98-cv-160, 1998 WL 2017631, at *8 (D. Haw. Mar. 9, 1998) *aff’d sub nom.*

¹⁵² *See, e.g., Border Power Plant Working Grp.*, 260 F. Supp. 2d at 1013–17 (holding environmental impacts of power plant in Mexico were indirect impacts of decision to construct electric transmission line because neither facility would exist without the other).

a. Fossil Fuel Extraction

In our 2017 article, we explained why downstream GHG emissions from the processing, transportation, and consumption of fossil fuels that are produced as a result of federal management plans and lease sales qualify as “indirect effects” that must be considered in an EA or EIS.¹⁵³ These downstream activities and the emissions they generate have a clear causal connection to federal authorizations: but for the authorization, the consumed.¹⁵⁴ These downstream activities are also reasonably foreseeable outcomes of authorizing the extraction of the fuels—indeed, producing fuel for energy supply is the primary purpose of the authorizations.¹⁵⁵ NEPA thus requires agencies to disclose downstream emissions as potential effects of fossil fuel supply projects and to quantify the emissions wherever tools and data are available to do so. In particular, where agencies are able to project the quantity of fuels to be produced, they must also estimate the GHG emissions generated from the combustion of the fuels. This is true whether the lease is for coal, oil, or gas.¹⁵⁶ When quantification is not feasible, this does not mean the emissions can be excluded from the analysis—to the contrary, agencies have a duty to qualitatively disclose and evaluate indirect effects where the nature of the effect is reasonably foreseeable even if the exact magnitude or extent is not.¹⁵⁷

Arguments that consideration and disclosure of downstream emissions are not required in the NEPA analysis for fossil fuel production have proven unpersuasive. One argument, which we call the “status quo” argument, has arisen in the context of proposals to reauthorize or expand coal mines that were already in operation. In that context, agencies asserted that the continued operation of the mine would not increase the *rate* of coal extraction and thus it would not increase the *rate* of coal consumption.¹⁵⁸ Courts have properly rejected this argument, holding that the continued operation of mines generates additional emissions over

¹⁵³ Burger & Wentz, *supra* note 11, at 112.

¹⁵⁴ For a more in-depth explanation of why upstream and downstream emissions qualify as indirect effects, see generally *id.*

¹⁵⁵ *Id.* at 128.

¹⁵⁶ Whether an agency must quantify processing and transportation emissions may depend on other aspects of the project, such as whether the agency knows the route and mode by which the fuels will be transported to end-users.

¹⁵⁷ 40 C.F.R. § 1502.22 (2012); see also *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549–50 (8th Cir. 2003).

¹⁵⁸ *S. Fork Band Council of W. Shoshone of Nev. v. U.S. Dep’t of the Interior*, 588 F.3d 718, 725 (9th Cir. 2009).

time even if it does not change the rate at which those emissions are generated, and this effect must be considered under NEPA.¹⁵⁹

Another argument, which we call the “perfect substitute” argument, posits that the extraction of fossil fuels will not actually cause an increase in fossil fuel consumption because the same quantity of fuel would be produced elsewhere and eventually consumed even if the agency does not approve the proposal.¹⁶⁰ In *High Country Conservation Advocates v. United States Forest Service*, the first case that specifically examined an agency’s obligation to evaluate downstream greenhouse gas emissions from coal production, a district court rejected this argument as “illogical” because increasing coal supply would affect coal prices and the demand for coal relative to other fuel sources.¹⁶¹ Other courts have adopted the reasoning from *High Country* in cases involving fossil fuel production.¹⁶²

Finally, a third argument, which we call the “It’s Not Our Call” argument, posits that the agency approving fossil fuel production lacks jurisdiction over downstream activities such as fossil fuel consumption and is therefore not required to consider the effects of those activities in its NEPA analysis. The primary basis for this argument was the Supreme Court’s decision in *Department of Transportation v. Public Citizen*.¹⁶³ There, the Supreme Court held that an agency need not consider environmental effects in its NEPA review when it has “no ability” to adopt a course of action that could prevent or otherwise influence those effects.¹⁶⁴ But agencies’ reliance on this case in the context of fossil fuel supply projects is misplaced because agencies do have the power to act on information about downstream emissions from leased fossil fuels (specifically, by restricting and limiting fossil fuel leasing from federal lands and waters).¹⁶⁵ Most of

¹⁵⁹ *Diné Citizens Against Ruining Our Env’t v. U.S. Off. of Surface Mining, Reclamation & Enft.*, 82 F. Supp. 3d 1201 (D. Colo. 2015), *appeal dismissed* (Aug. 18, 2015); *S. Fork Band Council of W. Shoshone of Nev.*, 588 F.3d at 725.

¹⁶⁰ See Section III.A for an overview of litigation challenging agency assumptions about energy market substitution.

¹⁶¹ *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1198 (D. Colo. 2014).

¹⁶² *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, 870 F.3d 1222, 1228 (10th Cir. 2017); *WildEarth Guardians v. Zinke*, No. 1:17-cv-00080, 2019 WL 2404860, at *30–31 (D. Mont. Feb. 11, 2019); *Mont. Env’tl. Info. Ctr. v. U.S. Off. of Surface Mining, Reclamation & Enft.*, 274 F. Supp. 3d 1074, 1098 (D. Mont. 2017), *amended in part, adhered to in part sub nom.*; *Mont. Env’tl. Info. Ctr. v. U.S. Off. of Surface Mining*, No. CV 15-106-M-DWM, 2017 WL 5047901 (D. Mont. Nov. 3, 2017).

¹⁶³ *U.S. Dep’t of Transp. v. Pub. Citizen*, 541 U.S. 752, 770 (2004).

¹⁶⁴ *Id.* at 766–70.

¹⁶⁵ *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 74 (D.D.C. 2019); *Diné Citizens*

the cases that we reviewed in our 2017 article dealt with whether agencies were required to disclose combustion emissions in the context of federal proposals for coal leasing.¹⁶⁶ At that time, there were five district court decisions on this question, all of which had held that such disclosure was required.¹⁶⁷ Since then, there have been a number of new decisions reinforcing the idea that downstream emissions from fossil fuel processing, transportation, and use qualify as indirect effects of fossil fuel production and clarifying that this basic principle applies regardless of the type of fuel being produced, the type of proposal, the type of NEPA documentation (EIS or EA), or the type of downstream emissions.¹⁶⁸

Against Ruining Our Env't v. U.S. Off. of Surface Mining, Reclamation & Enft, 82 F. Supp. 3d 1201, 1217 (D. Colo. 2015).

¹⁶⁶ Burger & Wentz, *supra* note 11, at 109, 164.

¹⁶⁷ In four of these cases, the courts determined that the responsible agencies failed to take the requisite “hard look” at downstream emissions from the combustion of the coal: *Diné Citizens*, 82 F. Supp. 3d at 1211; *WildEarth Guardians v. U.S. Off. of Surface Mining*, 104 F. Supp. 3d 1208, 1231 (D. Colo. 2015), *vacated as moot* 652 Fed. Appx. 717 (10th Cir. 2016); *WildEarth Guardians v. U.S. Off. of Surface Mining*, No. CV-14-13-BLG-SPW-CSO, 2015 WL 6442724, at *7 (D. Mont. 2015); *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1195 (D. Colo. 2014). In the fifth case, the court held that the agency’s analysis of downstream emissions was adequate, in part because the agency had already disclosed emissions from the combustion of the leased coal. *WildEarth Guardians v. U.S. Forest Serv.*, 120 F. Supp. 3d 1237, 1276 (D. Wyo. 2015).

¹⁶⁸ *Citizens for a Healthy Cmty. v. U.S. Bureau of Land Mgmt.*, 377 F. Supp. 3d 1223, 1237 (D. Colo. 2019); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 74 (D.D.C. 2019) (BLM must analyze downstream emissions in oil and gas lease EAs); *WildEarth Guardians v. Zinke*, No. 1:17-cv-00080, 2019 WL 2404860, at *21 (D. Mont. Feb. 11, 2019) (OSM must evaluate indirect and cumulative impacts caused by coal trains beyond the area near the mine, as there was sufficient data to support this analysis); *W. Org. of Res. Councils v. U.S. Bureau of Land Mgmt.*, No. 4:16-cv-00021-BMM, 2018 WL 1475470, at *40 (D. Mont. Mar. 26, 2018) (BLM must quantify emissions from coal, oil, and gas combustion in RMP EISs); *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, 342 F. Supp. 3d 1145, 1156 (D. Colo. 2018) (BLM must disclose emissions from oil and gas combustion in RMP EIS and also evaluate potential impacts of those emissions in light of revised total GHG projections); *San Juan Citizens All. v. U.S. Bureau of Land Mgmt.*, 326 F. Supp. 3d 1227, 1246 (D.N.M. 2018) (BLM must disclose emissions from oil and gas combustion in lease sale EA and also evaluate potential impacts of those emissions in light of revised total GHG projections); *Mont. Env'tl. Info. Ctr. v. U.S. Off. of Surface Mining*, 274 F. Supp. 3d 1074, 1092, 1094 (D. Mont. 2017), *amended in part, adhered to in part sub nom.* *Mont. Env'tl. Info. Ctr. v. U.S. Off. of Surface Mining*, No. CV 15-106-M-DWM, 2017 WL 5047901 (D. Mont. Nov. 3, 2017) (non-GHG effects of coal transport and combustion must also be considered); *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, 870 F.3d 1222, 1234–39 (10th Cir. 2017) (in a coal lease EIS, agency cannot dismiss the significance of downstream emissions from coal combustion by claiming perfect substitution).

1) Type of Fuel

Downstream emissions qualify as indirect effects of oil and gas production for the same reasons that they qualify as indirect effects of coal production.¹⁶⁹ Some agencies have argued against disclosure on the grounds that emissions from oil and gas combustion are more speculative than those from coal combustion because oil and gas are used for purposes other than energy production.¹⁷⁰ As noted above, the inability to quantify indirect effects does not mean that agencies can ignore these in their analysis. Moreover, the fact that agencies are already quantifying downstream emissions (primarily combustion emissions) in EISs for proposals to authorize oil and gas production demonstrates that such quantification is feasible where the agency has also estimated the amount of oil and gas to be produced. Recognizing this, courts have explicitly ordered agencies to quantify combustion emissions in four of the five decisions requiring disclosure of downstream emissions from oil and gas production.¹⁷¹ In the fourth decision, the court explained that it was not ordering quantification because, unlike coal which has a “single downstream use,” oil is sometimes used for plastics or other products that will not be burned.¹⁷² But the court did note that BLM must “consider whether quantifying GHG emissions from that use is reasonably possible” and “thoroughly explain” any decision not to quantify emissions, and that “if BLM receives estimates

¹⁶⁹ *Citizens for a Healthy Cmty.*, 377 F. Supp. 3d at 1237; *WildEarth Guardians*, 368 F. Supp. 3d at 74; *W. Org. of Res. Councils*, 2018 WL 1475470, at *31–32; *Wilderness Workshop*, 342 F. Supp. 3d at 1156; *San Juan Citizens All.*, 326 F. Supp. 3d at 1242, 1244.

¹⁷⁰ Supplemental Brief at 5–6, *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41 (D.D.C. 2019) (No. 1:16-cv-01822).

¹⁷¹ *Citizens for a Healthy Cmty.*, 377 F. Supp. 3d at 1237; *W. Org. of Res. Councils*, 2018 WL 1475470, at *40; *Wilderness Workshop*, 342 F. Supp. 3d at 1156; *San Juan Citizens All.*, 326 F. Supp. 3d at 1228. There are also many undecided cases involving failures to quantify indirect GHG emissions in the context of oil and gas production EAs—the key issue being that agencies are dismissing the significance of GHG emissions without a complete assessment of the GHG impact. *See* Complaint at 29–30, *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, No. 4:18-cv-00073 (D. Mont. May 15, 2018) (failure to quantify downstream emissions in oil and gas leasing EAs); Complaint at 21, 39–40, *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, No. 1:18-cv-00987 (D. Colo. Apr. 26, 2018) (failure to take hard look at indirect emissions from 53 oil and gas lease parcels—“BLM’s Determinations of NEPA Adequacy for the lease auctions fail to consider or quantify any site-specific direct, indirect, and cumulative greenhouse gas emissions from leasing and their resulting climate change effects.”); Complaint at 25, *Ctr. for Biological Diversity v. U.S. Forest Serv.*, No. 2:17-cv-00372 (S.D. Ohio May 2017) (agency failed to take hard look at GHG emissions and climate impacts of oil and gas leasing in national forest).

¹⁷² *WildEarth Guardians*, 368 F. Supp. 3d at 74.

from outside parties based on the use of [emission estimating] calculators, it must assess those estimates and explain why they are unreliable or otherwise inappropriate to use in its decisionmaking.”¹⁷³

2) Type of Proposal

Downstream emissions must be disclosed and analyzed in the context of both project-level leasing decisions and broader management plans and actions that authorize future fossil fuel development.¹⁷⁴ However, the required depth of the analysis and whether emissions must be quantified depends on whether the agency has projected or is capable of projecting the quantity of fuels to be produced. As noted in *High Country Conservation Advocates*, in which the court required quantitative disclosure of GHG emissions in the context of a rule amendment which would allow for coal leasing in previously designated “roadless” areas:

The agency cannot—in the same FEIS—provide detailed estimates of the amount of coal to be mined . . . and simultaneously claim that it would be too speculative to estimate emissions from “coal that may or may not be produced” from “mines that may or may not be developed.” The two positions are nearly impossible to reconcile.¹⁷⁵

Courts have also required quantification of downstream (combustion) emissions in cases involving resource management plans where the agency had estimated the amount of coal, oil, and/or gas to be produced pursuant to those plans.¹⁷⁶

¹⁷³ *Id.* at 75.

¹⁷⁴ For examples of decisions requiring disclosure and analysis of downstream emissions in the context of broader planning actions, see *Citizens for a Healthy Cmty.*, 377 F. Supp. 3d at 1237; *W. Org. of Res. Councils*, 2018 WL 1475470, at *40 (BLM must quantify emissions from coal, oil, and gas combustion in RMP EISs); *Wilderness Workshop*, 342 F. Supp. 3d at 1156 (BLM must disclose emissions from oil and gas combustion in RMP EIS and also evaluate potential impacts of those emissions in light of revised total GHG projections).

¹⁷⁵ *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1196–97 (D. Colo. 2014).

¹⁷⁶ *W. Org. of Res. Councils*, 2018 WL 1475470, at *13 (In light of the degree of foreseeability and specificity of information available to the agency while completing the EIS, NEPA requires BLM to consider in the EIS the environmental consequences of the downstream combustion of the coal, oil and gas resources potentially open to development under these RMPs. Without such analysis, the EIS fails to “foster informed decision-making” as required by NEPA”); *Wilderness Workshop*, 342 F. Supp. 3d at 1156 (“An agency may not avoid an obligation to analyze in an EIS environmental consequences that

3) Type of NEPA Documentation

Some agencies have justified decisions not to disclose or quantify downstream GHG emissions in fossil fuel leasing EAs on the grounds that the proposals will not generate significant GHG impacts and thus an in-depth analysis of GHG emissions is not warranted.¹⁷⁷ The problem with this argument is that it is impossible for an agency to gauge the significance of the GHG impact without analyzing the full scope of emissions that qualify as direct, indirect, and cumulative effects of the project. Courts have thus properly held that downstream emissions must also be disclosed and quantified in the context of fossil fuel leasing EAs.¹⁷⁸ One case dealt with a particularly egregious situation in which BLM had failed to quantify *any* GHG emissions (direct, indirect, or cumulative) in EAs and FONSIIs issued for 282 oil and gas leases encompassing approximately 303,000 acres of land in Wyoming.¹⁷⁹ There, the D.C. district court held that BLM must quantify direct emissions from oil and gas production and also account for downstream emissions.¹⁸⁰ As we discuss in Part III, the failure to account for the full scope of GHG emissions that qualify as impacts of production proposals renders an agency's FONSI arbitrary and capricious.

A related question is whether an agency can ignore downstream emissions in a leasing EA or NEPA adequacy determination that is tiered to a broader PEIS. The answer depends on the level of detail with which GHGs were disclosed in the PEIS. If an agency fully quantified downstream emissions for a leasing area in a PEIS, it could potentially rely on that analysis in its tiered EA or adequacy determination. But if the programmatic analysis is too broad or too course (e.g., a purely qualitative analysis of potential GHG impacts) or out of date, then it would be

foreseeably arise from an RMP merely by saying that the consequences are unclear or will be analyzed later when an [Environmental Assessment] is prepared for a site-specific program proposed pursuant to the RMP.”) (quoting *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1072 (9th Cir. 2002) (internal quotation marks omitted)).

¹⁷⁷ We discuss the adequacy and reasonableness of such significance determinations in Part III. Here, we focus on whether the failure to disclose emissions can be justified by a finding of no significant impact.

¹⁷⁸ *WildEarth Guardians*, 368 F. Supp. 3d at 75; *WildEarth Guardians v. Zinke*, No. 1:17-cv-00080, 2019 WL 2404860, at *11 (D. Mont. Feb. 11, 2019); *San Juan Citizens All. v. U.S. Bureau of Land Mgmt.*, 326 F. Supp. 3d 1227, 1228 (D.N.M. 2018); *Mont. Env'tl. Info. Ctr. v. U.S. Off. of Surface Mining*, 274 F. Supp. 3d 1074, 1098–99 (D. Mont. 2017), *amended in part, adhered to in part sub nom.* No. CV 15-106-M-DWM, 2017 WL 5047901 (D. Mont. Nov. 3, 2017).

¹⁷⁹ *WildEarth Guardians*, 368 F. Supp. 3d at 55.

¹⁸⁰ *Id.* at 85.

necessary for the agency to conduct a more detailed examination of downstream GHG emissions when issuing lease sales.¹⁸¹

4) Type of Downstream Emissions

As noted above, transportation and processing emissions (including leakage that occurs during transport) also qualify as indirect effects of federal approvals for fossil fuel production. Unlike with combustion emissions, it is not always possible to quantify processing and transportation emissions even where the agency has projected the amount of fossil fuel production. Estimating transportation emissions, in particular, may be impossible if the agency does not know the route or mode by which the fuels will be transported to end-users. For this reason, agencies sometimes ignore transportation and processing emissions in NEPA documentation even where they acknowledge and disclose combustion emissions as indirect effects of proposals.¹⁸² But NEPA requires more: agencies should discuss these emissions qualitatively at minimum¹⁸³ and should conduct a quantitative analysis where tools and data are available to do so. For example, where agencies know the rail routes and shipping destinations for coal that would be mined as a result of federal authorizations, the reviewing agencies must calculate the GHG emissions from rail transport.¹⁸⁴

¹⁸¹ *See id.* There have been at least two instances in which courts have upheld the NEPA documentation (or lack thereof) for oil and gas lease sales that were tiered to programmatic reviews despite plaintiffs' contentions that the sales were issued without adequate analysis of downstream GHG emissions. But neither decision involved a careful analysis of whether such emissions qualified as indirect effects. In one case, the reviewing court did not even address plaintiffs' arguments about climate change. *See N. Alaska Envtl. Cent. v. U.S. Dep't of the Interior*, No. 3:18-cv-00030, 2018 WL 6424680 (D. Alaska Dec. 6, 2018). In the second case, the court held that BLM's very limited analysis of GHG emissions, which did not include downstream emissions, was sufficient because BLM had estimated that the emissions would represent only a small increase in state emissions and were therefore significant. *Diné Citizens Against Ruining Our Env't v. Jewell*, 312 F. Supp. 3d 1031, 1096 (D.N.M. 2018), *rev'd sub nom* *Diné Citizens Against Ruining Our Env't v. Bernhardt*, 923 F.3d 831 (10th Cir. 2019) (on appeal, the 10th Circuit did not reach the arguments related to GHG emissions because it concluded that Appellants had not provided a record from which it could assess the adequacy of BLM's air pollution analysis).

¹⁸² *N. Alaska Envtl. Cent.*, 2018 WL 6424680; *Diné*, 312 F. Supp. 3d at 1031.

¹⁸³ 40 C.F.R. § 1502.22; *see also* *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549–50 (8th Cir. 2003).

¹⁸⁴ There are two decisions requiring further analysis of impacts from coal transport in the context of federal approvals for coal mining, but in both cases the agencies had already disclosed GHG emissions from transport and thus the decisions focused on the need to disclose other impacts (e.g., conventional air pollutants). These cases thus expand

One scope-related question which has not been directly addressed is whether non-CO₂ GHGs such as methane must also be disclosed in the downstream emissions analysis.¹⁸⁵ The answer is an obvious “yes”—there is no rationale for treating these differently than CO₂, although there may be instances in which it is not possible to quantify these emissions in the same fashion as CO₂.¹⁸⁶ Agencies may also argue against disclosure on the grounds that these emissions are relatively insignificant as compared with CO₂, but arguments about insignificance would need to be supported by the sort of quantitative analysis which considers not only the tonnage of non-CO₂ GHG emissions but also the global warming potential of those emissions.¹⁸⁷

In sum: the cases generally support the proposition that downstream emissions fall within the scope of indirect impacts that should be disclosed in NEPA reviews for federal proposals that will result in the extraction of fossil fuels. The decisions also provide insight on the circumstances in which NEPA requires quantitative disclosure of such impacts. We return to questions about the adequacy and reasonableness of the technical assumptions and findings encompassed within the GHG disclosure in Part III.

the obligation to evaluate transportation-related impacts to include non-GHG emissions. See *WildEarth Guardians v. Zinke*, No. 1:17-cv-00080, 2019 WL 2404860, at *7 (D. Mont. Feb. 11, 2019) (OSM must evaluate indirect and cumulative impacts caused by coal trains beyond the area near the mine, as there was sufficient data to support this analysis); *Mont. Env'tl. Info. Ctr. v. U.S. Off. of Surface Mining*, 274 F. Supp. 3d 1074, 1098–99 (D. Mont. 2017), *amended in part, adhered to in part sub nom.* No. CV 15-106-M-DWM, 2017 WL 5047901 (D. Mont. Nov. 3, 2017) (non-GHG effects of coal transport and combustion must also be considered). There have not yet been any decisions on the failure to disclose or quantify processing emissions, but one can infer from the case law that these should also be disclosed and quantified where possible. There is also a pending lawsuit in which the alleged failure to account for downstream emissions appears to encompass processing as well as transportation emissions. Complaint at 5, *S. Utah Wilderness All. v. Bernhardt*, 2:19-cv-00266 (D. Utah 2019) (alleging that BLM's analysis of twenty oil and gas leases in Utah was flawed because it failed to address GHG emissions from activities that occur after production, but before combustion, such as fugitive emissions that leak from pipelines).

¹⁸⁵ There is one lawsuit involving BLM's issuance of twenty oil and gas leases in Utah in which plaintiffs have alleged that the NEPA analyses is flawed due to BLM's failure to disclose non-CO₂ GHGs, particularly methane. Complaint at 17, *S. Utah Wilderness All. v. Bernhardt*, No. 2:19-cv-00266 (D. Utah Apr. 19, 2019).

¹⁸⁶ Tools are available to calculate N₂O and methane emissions from combustion, at a minimum. See EPA, GREENHOUSE GAS INVENTORY GUIDANCE: DIRECT EMISSIONS FROM STATIONARY COMBUSTION SOURCES, APPENDIX A (2016), https://www.epa.gov/sites/production/files/2016-03/documents/stationaryemissions_3_2016.pdf [<https://perma.cc/YDH5-N7L8>].

¹⁸⁷ See *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 71–74 (D.D.C. 2019).

B. Fossil Fuel Transportation

Both upstream and downstream emissions typically qualify as indirect effects of fossil fuel transportation projects.¹⁸⁸ These emissions are reasonably foreseeable because agencies know that the fossil fuels to be transported via the approved infrastructure will be extracted, and all or most of the fuels will be processed and combusted.¹⁸⁹ These emissions are also causally linked to the approval of the transportation infrastructure because: (i) agencies approve these projects based on findings that additional transportation capacity is needed to transport the fuels to end-users,¹⁹⁰ and one can therefore infer that (ii) without the necessary capacity addition, the same quantity of fuels would not be produced and transported to end-users.

Some agencies (primarily FERC) have argued that the approval of transportation infrastructure does not cause upstream production or downstream consumption because there are other ways in which fuels could be transported to end-users if a project is not approved.¹⁹¹ The problem with this argument is that it assumes that transportation capacity exists elsewhere to transport the fuels to the market, which undermines the required determination that the project is necessary due to capacity constraints. It also ignores basic market principles of supply and demand. Relatedly, agencies have argued that upstream and downstream emissions are not reasonably foreseeable because of uncertainties about market impacts and energy substitution.¹⁹² But this argument fails as well. As noted by FERC Commissioner Richard Glick in a dissent to a FERC order issuing a certificate for a natural gas pipeline project:

It is reasonable to assume that building incremental transportation capacity will spur additional production and result in some level of combustion of natural gas, even if the exact details of the method or location are not definite. . . . [W]hen the nature of the effect (end-use emissions) is

¹⁸⁸ WEBB, *supra* note 134, at 21.

¹⁸⁹ As discussed above, there are multiple end-uses for oil and gas but the vast majority of produced oil and gas is combusted for energy generation (whether in power plants, industrial sources, or vehicles) and agencies have nonetheless been able to estimate combustion emissions for these fuels.

¹⁹⁰ WEBB, *supra* note 134, at 17; Burger & Wentz, *supra* note 11, at 166.

¹⁹¹ Burger & Wentz, *supra* note 11, at 109, 137.

¹⁹² *Id.* at 132.

reasonably foreseeable, but its extent is not . . . an agency may not simply ignore the effect.¹⁹³

The case law generally supports the treatment of both upstream and downstream emissions as indirect effects of transportation infrastructure, but courts have not fleshed out or enforced the requirement to analyze these emissions with the same clarity or assertiveness as they have in cases involving fossil fuel production.¹⁹⁴ This may be due to the fact that there are fewer decisions on transportation approvals.¹⁹⁵ It may also be the case that courts are not enforcing NEPA requirements as assertively in this context because they do not think that the approval of transportation infrastructure is as significant a driver of fossil fuel consumption as federal fossil fuel leasing programs.

The early case law on the requirement to evaluate upstream and downstream emissions from authorizations of fossil fuel transportation infrastructure is illustrative. The first two decisions on this question both involved STB's approval of rail lines built to transport coal. In *Mid States Coalition for Progress v. Surface Transportation Board*, the Eighth Circuit Court of Appeals required the STB to evaluate downstream emissions from the combustion of the transported coal, and in *Northern Plains Resource Council, Inc. v. Surface Transportation Board*, the Ninth Circuit Court of Appeals required STB to consider upstream emissions from the mining of the coal.¹⁹⁶ In those cases, the courts confronted and dismissed several of the same arguments related to causation and foreseeability that were raised in the coal extraction cases.¹⁹⁷ In particular, the Eighth Circuit's decision in *Mid States Coalition* found that the development of infrastructure intended to transport coal would affect the price of coal relative to other energy sources and this would affect patterns of coal

¹⁹³ Texas E. Transmission, LP, 164 FERC ¶ 61,037 (2018) (internal quotations omitted).

¹⁹⁴ Burger & Wentz, *supra* note 11, at 142–43.

¹⁹⁵ *Id.* at 143.

¹⁹⁶ Notably, in the case involving the failure to evaluate upstream emissions, petitioners argued that methane emissions and other environmental impacts from the connected coal mines should be analyzed as cumulative effects (these are typically treated as indirect effects). The court's analysis therefore focused on whether these effects were reasonably foreseeable, since a cumulative impact need not be "caused" by the project. *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1082 (9th Cir. 2011). But as discussed below, the rationale for concluding that a transport project "causes" downstream emissions applies in equal force to upstream emissions.

¹⁹⁷ *N. Plains Res. Council*, 668 F.3d at 1082; *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549 (8th Cir. 2003).

production and consumption, and thus downstream emissions were an indirect effect of the railway.¹⁹⁸

However, courts reached different conclusions in early cases involving natural gas and oil pipelines. There were two early decisions finding that an analysis of upstream emissions (from production) was not required in the NEPA review for oil and gas pipelines because those pipelines would not cause upstream production.¹⁹⁹ A third decision which pertained to the scope of review for non-GHG air pollutants upheld FERC's review of a pipeline precisely because "FERC explicitly considered the environmental impact of downstream emissions and imposed what it reasonably believed to be effective measures to mitigate the impact."²⁰⁰ At that time, neither courts nor agencies had offered a principled basis for why the scope of indirect emissions analysis should differ for coal rail lines and pipelines, nor had they offered a compelling argument for finding that pipelines do not affect natural gas production and consumption in the same fashion that coal railways affect coal production and consumption.²⁰¹ We argued then that the reasoning which controlled the outcome of the coal production and coal railway cases should apply in equal force to other forms of transportation infrastructure.²⁰²

There were also some early decisions on LNG export decisions which held that FERC need not address the indirect effects of natural gas exports in its NEPA review because it was DOE and not FERC that was ultimately responsible for approving those exports.²⁰³ But in those cases, the D.C. Circuit made clear that it was not expressing any opinion on DOE's independent NEPA obligations to address such indirect effects in its review of LNG export authorizations.²⁰⁴ Those decisions are the result

¹⁹⁸ *Mid States Coal. for Progress*, 345 F.3d at 549.

¹⁹⁹ In one of those decisions, the court found that the Department of State's administrative record for an oil and gas pipeline contained at least some information to support this finding (e.g., about oil production rates and other transportation options). *Sierra Club v. Clinton*, 746 F. Supp. 2d 1025, 1045 (D. Minn. 2010). In the other (unpublished) decision, the court simply deferred to FERC's unsupported claim of perfect substitution for a natural gas pipeline without conducting any analysis whatsoever. *Coal. for Responsible Growth & Res. Conservation v. FERC*, 485 F. App'x 472, 474 (2d Cir. 2012).

²⁰⁰ *S. Coast Air Quality Mgmt. Dist. v. FERC*, 621 F.3d 1085, 1093–94 (9th Cir. 2010).

²⁰¹ See generally *Coal. for Responsible Growth & Res. Conservation*, 485 F. App'x at 472, 474; *S. Coast Air Quality Mgmt. Dist.*, 621 F.3d at 1093–94; *Sierra Club*, 746 F. Supp. 2d at 1044.

²⁰² *Burger & Wentz*, *supra* note 11, at 109, 157.

²⁰³ *Sierra Club v. FERC*, 827 F.3d 59, 68 (D.C. Cir. 2016); *Sierra Club & Galveston Baykeeper v. FERC*, 827 F.3d 36, 47 (D.C. Cir. 2016); *EarthReports Inc. v. FERC*, 828 F.3d 949, 952 (D.C. Cir. 2016).

²⁰⁴ *Sierra Club & Galveston Baykeeper*, 827 F.3d at 45.

of the unique division of authority between DOE and FERC and are thus of little relevance to interpreting agency obligations in other contexts.

More recent decisions on natural gas pipelines and LNG export terminals have made it clear that downstream emissions typically fall within the scope of indirect impacts that should be evaluated in NEPA reviews for these projects.²⁰⁵ One of the most important decisions on this issue was a D.C. Circuit case involving FERC's review of an interstate natural gas pipeline: *Sierra Club v. FERC*.²⁰⁶ There, the D.C. Circuit Court of Appeals found that downstream emissions from natural gas combustion were an indirect effect of the proposed pipeline project, as they were both foreseeable and causally linked to the approval of the pipeline project.²⁰⁷ In regards to foreseeability, the court noted that the project was intended to transport the gas to power plants in Florida, some of which already existed, others of which were in the planning stages.²⁰⁸ Thus, the court noted that the combustion of the gas "is not just 'reasonably foreseeable,' it is the project's entire purpose."²⁰⁹ With regards to causation, the court held that because FERC can act on information about GHG emissions and climate change impacts when deciding whether to issue a pipeline certificate, and because FERC can deny the certificate if it finds that the project would be too harmful to the environment, FERC's approval is a "legally relevant cause" of the downstream effects of combusting the gas.²¹⁰

The court also held that quantification of the downstream GHG emissions was required.²¹¹ FERC had argued that it is impossible to know exactly what quantity of GHGs will be emitted due to the approval of the pipeline because it depends on uncertain variables such as the operating decisions of individual plants and demand for electricity in the region.²¹² The court disagreed, noting that NEPA requires "reasonable forecasting" and that FERC had already estimated how much gas the pipelines would transport and had provided no good reason as to why this number could not also be used to estimate combustion emissions.²¹³ The court explained that quantification was necessary because it would

²⁰⁵ *Sierra Club v. U.S. Dep't of Energy*, 867 F.3d 189, 192 (D.C. Cir. 2017) (Freeport LNG terminal); *Sierra Club*, 827 F.3d at 68; *Indigenous Envtl. Network v. U.S. Dep't of State*, No. 4:17-cv-00029, 2017 U.S. Dist. LEXIS 164786, at *68 (D. Mont. Nov. 8, 2018).

²⁰⁶ *Sierra Club v. FERC*, 867 F.3d 1357, 1357 (D.C. Cir. 2017).

²⁰⁷ *Id.* at 1374.

²⁰⁸ *Id.* at 1371.

²⁰⁹ *Id.* at 1372.

²¹⁰ *Id.*

²¹¹ *Id.* at 1374.

²¹² *Sierra Club v. FERC*, 867 F.3d at 1373–74.

²¹³ *Id.* at 1374.

“permit the agency to compare the emissions from the project to emissions from other projects, to total emissions from the state or region, or to regional or national emissions-control goals” and “[w]ithout such comparisons, it is difficult to see how FERC could engage in ‘informed decision making’ with respect to the greenhouse-gas effects of this project, or how ‘informed public comment’ could be possible.”²¹⁴

The D.C. Circuit Court of Appeals decided another case, *Birckhead v. FERC*, in which it sought to clarify its position on FERC’s obligation to address downstream emissions in its review of natural gas transportation infrastructure.²¹⁵ Plaintiffs alleged that FERC violated NEPA by failing to disclose emissions from the consumption of natural gas when the record contained information about the amount of gas to be transported (200,000 decatherms) and its destination (southeast markets).²¹⁶ FERC maintained that the emissions were neither caused by its approval nor reasonably foreseeable and that *Sierra Club v. FERC* was not apposite because FERC did not know the exact power plants at which the natural gas would be used.²¹⁷ The court quickly disposed of FERC’s causation and foreseeability arguments, just as it had in *Sierra Club v. FERC*, and noted that it was “troubled . . . by the Commission’s attempt to justify its decision to discount downstream impacts based on its lack of information about the destination and end use of the gas in question” because FERC had an affirmative obligation to at least attempt to obtain information necessary to fulfill its statutory duties and had made “no effort” to do so in this case.²¹⁸ But the court ultimately dismissed the complaint on the grounds that petitioners “failed to raise this record-development issue in the proceedings before the Commission.”²¹⁹ In doing so, it implicitly accepted FERC’s argument that additional information was needed to assess downstream emissions and the court mischaracterized the petitioners’ complaint (which alleged a failure to estimate emissions based on information that was already on the record).²²⁰

²¹⁴ *Id.* The court also rejected FERC’s arguments about perfect substitution, which we return to in Part III.

²¹⁵ *Birckhead v. FERC*, 925 F.3d 510 (D.C. Cir. 2019).

²¹⁶ Final Opening Brief of Petitioners at 39–40, *Birckhead v. FERC*, 925 F.3d 510 (D.C. Cir. 2019) (No. 18-1218). Commissioner LaFleur actually performed this very calculation to demonstrate that it was feasible. *Id.* at 12.

²¹⁷ *Birckhead*, 925 F.3d at 518.

²¹⁸ *Id.* at 519–20.

²¹⁹ *Id.* at 520.

²²⁰ One possible explanation for the court’s approach is that it wanted to allow this particular project to go forward without formally curtailing NEPA requirements. The project at issue was a compressor station that would enhance the capacity of an existing

The decision in *Birckhead v. FERC* thus raises a number of questions for future litigants seeking to compel FERC disclosures of downstream emissions regarding the manner in which plaintiffs must frame their claims, the extent to which FERC can rely on claims about “uncertainty” or “inadequate information” to avoid disclosing downstream emissions, and the circumstances in which emissions from downstream natural gas combustion are not a reasonably foreseeable outcome of natural gas transportation infrastructure. But it does not disrupt or significantly modify the holding in *Sierra Club v. FERC*, which remains the primary authority on FERC’s obligation to evaluate downstream emissions from natural gas pipelines.²²¹

The same rationale for requiring analysis of downstream emissions applies to upstream emissions: if a transportation project causes an increase in fossil fuel consumption, then there must be a corresponding increase in fossil fuel production on the other end of the supply chain.²²² Thus, induced natural gas production is as much an “indirect effect” of the transportation infrastructure as induced consumption. As noted above, disclosure of upstream emissions has been explicitly required in the context of a federal approval of a coal railway. Although no decision has yet been issued finding inadequate analysis of upstream (i.e., production) emissions in the context of pipeline projects, there are at least two decisions finding adequate analysis *because* the agency incorporated quantitative analysis of upstream emissions in its review.²²³

First, in *Sierra Club v. U.S. Department of Energy*, the D.C. Circuit Court of Appeals held that DOE had adequately assessed the indirect emissions from LNG exports by incorporating general assessments of life-cycle GHG emissions from LNG exports (which included both upstream and

pipeline, whereas the project at issue in *Sierra Club v. FERC* was a new multistate pipeline project. Although the court did not hold on what NEPA actually requires for a compressor station, it did state that emissions from downstream natural gas combustion are not “as a categorical matter” always a reasonably foreseeable outcome of natural gas transportation projects. *Id.* at 519. This conclusion is debatable: if the project is intended to meet a need for increased transportation capacity, then it will presumably enable increases in both natural gas production and consumption, and downstream emissions are thus a reasonably foreseeable impact even if there is uncertainty about the extent of the impact.

²²¹ *Id.*

²²² Burger & Wentz, *supra* note 11, at 113–14.

²²³ *Sierra Club v. U.S. Dep’t of Energy*, 867 F.3d 189 (D.C. Cir. 2017) (Freeport LNG terminal); *Indigenous Envtl. Network v. U.S. Dep’t of State*, 347 F. Supp. 3d 561 (D. Mont. 2018).

downstream emissions).²²⁴ Second, on *Indigenous Environmental Network v. U.S. Department of State*, the Montana district court held that the Department of State had adequately considered upstream emissions from tar sands oil production in its review of the Keystone XL pipeline by integrating the Canadian review (which encompassed such production) into its review.²²⁵ Notably, there was no question about whether the Department of State must consider downstream emissions—it had already conducted an in-depth analysis of those as part of its review.²²⁶ These decisions support the idea that *both* upstream and downstream emissions fall within the scope of “indirect effects” that should be considered under NEPA for projects involving fossil fuel transportation, and courts are likely to intervene where such emissions are omitted from the analysis altogether.²²⁷

However, the D.C. Circuit Court of Appeals upheld FERC’s decision not to disclose upstream emissions for a natural gas compressor project in *Birckhead v. FERC*.²²⁸ In that case, FERC justified its decision not to disclose upstream emissions on the grounds that pipeline approvals only cause upstream emissions where “the record demonstrates that the proposed project represents the *only* way to get additional gas from a specified production area into the interstate pipeline system.”²²⁹ Petitioners responded that FERC had determined there was a “need” for the project “based on the fact that [the production and shipping company] has executed a binding precedent agreement for . . . 100 percent of the design capacity” and that this was enough to show that the project would cause additional natural gas production.²³⁰ The court held in favor of FERC, asserting that petitioners had identified no record evidence to: (i) “help [FERC] predict the number and location of any additional wells that would be drilled as a result of production demand created by the project” or (ii) prove that the natural gas would not be extracted in the absence of the project.²³¹ Regarding FERC’s public need determination,

²²⁴ *Sierra Club v. U.S. Dep’t of Energy*, 867 F.3d at 202. There are several unpublished opinions that rely on the analysis in this case: *Sierra Club v. U.S. Dep’t of Energy*, 703 F. App’x 1 (D.C. Cir. 2017).

²²⁵ *Indigenous Envtl. Network*, 347 F. Supp. 3d at 580.

²²⁶ *Id.* at 576.

²²⁷ *See, e.g., id.* at 575–76; *Sierra Club v. U.S. Dep’t of Energy*, 867 F.3d at 201–02.

²²⁸ *Birckhead v. FERC*, 925 F.3d 510, 517 (D.C. Cir. 2019).

²²⁹ *Id.*

²³⁰ *Id.*

²³¹ *Id.* at 517–18. The court noted that it was “dubious of [FERC’s] assertion that asking [the natural gas producer and shipper] about the origin of the gas would be futile” but

the court held that “just because [FERC] is satisfied that there is a market need for a given project does not necessarily mean that a shipper/producer would not have the ability to bring the gas to market via another channel were [FERC] to deny a certificate for the project.”²³² The court thus held that petitioners had not presented enough evidence to rebut FERC’s presumption that the project would not induce natural gas production.²³³

The court thus set an extraordinarily high bar for petitioners seeking to compel disclosure of upstream emissions, without actually deciding whether downstream emissions qualified as indirect effects of the project. The court’s differential treatment of upstream emissions as compared with downstream emissions is baffling. As noted above, if a transportation project causes an increase in natural gas consumption then it also causes an increase in natural gas production—these are two sides of the same coin—the additional gas cannot be consumed if it is not produced. And upstream emissions can be estimated in the same fashion as downstream emissions (by multiplying the transported natural gas by an emissions factor).²³⁴ There are also more sophisticated energy market modelling techniques which FERC could use to estimate the net increase in upstream production and emissions (we return to these in Part III).²³⁵

In our view, the D.C. Circuit has failed to justify its differential treatment of upstream and downstream emissions, and also erred in concluding that a binding precedent agreement for 100 percent of transportation capacity is insufficient to establish a causal link between the project and natural gas production.²³⁶ NEPA requires “reasonable forecasting”

that this was not dispositive in its ruling because petitioners had not claimed that FERC’s failure to seek out additional information violated NEPA.

²³² *Id.* at 518.

²³³ *Id.*

²³⁴ See, e.g., *GHG Emissions Associated with Two Proposed Natural Gas Transmission Lines in Virginia*, OUR ENERGY POL’Y 1, https://www.ourenergypolicy.org/wp-content/uploads/2016/02/GHG-Emissions-Associated-with-Proposed-Natural-Gas-Transmission-Lines-in-Virginia_Final-edit5-1.pdf [<https://perma.cc/56T5-HFV4>].

²³⁵ Rick Glick & Matthew Christiansen, *FERC and Climate Change*, 40 ENERGY L.J. 1, 14 (2019), https://www.eenews.net/assets/2019/05/06/document_gw_02.pdf [<https://perma.cc/BQ7F-2ZHA>]. Commissioner Glick argued that FERC

must also consider the secondary effects [of pipelines]. For example, an increase in interstate pipeline capacity may also, by decreasing the price of delivered gas, increase the demand for that gas and, in turn increase its production—which can lead to a significant increase in upstream emissions, through flaring of natural gas, fugitive methane emissions, etc.

²³⁶ *Birckhead*, 925 F.3d at 517–18.

of probable impacts,²³⁷ and it is highly probable that a fully subscribed transportation project will enable additional natural gas production. In sum: there are a number of cases which support the idea that upstream and downstream emissions fall within the scope of indirect impacts from fossil fuel transportation infrastructure.²³⁸ However, there are some judicial interpretations which may pose challenges for plaintiffs seeking to enforce this requirement, especially as it applies to upstream emissions. In particular, the D.C. Circuit's interpretation of FERC obligations in *Birckhead v. FERC* places a significant burden on potential plaintiffs to rebut FERC assumptions that transportation projects do not cause an increase in upstream production²³⁹ and also raises questions about how plaintiffs can adequately frame arguments about the requirement to disclose downstream emissions.

1. Upstream and Downstream Emissions as Effects of Connected Actions

Upstream and downstream emissions may also be conceptualized as the effects of “connected actions” when such emissions occur as a result of other federal approvals in the fossil fuel supply chain that must also undergo NEPA review.²⁴⁰ As discussed in Part I, federal actions are “connected” if they: “(i) automatically trigger other actions which may require EISs, (ii) cannot or will not proceed unless other actions are taken previously or simultaneously, or (iii) are independent parts of a larger action and depend on the larger action for their justification.”²⁴¹ The requirement to evaluate connected actions in a single NEPA review is often referred to as a rule prohibiting the “segmentation” of actions and their environmental impacts, reflecting the language in section 1508.27 of the CEQ regulations.²⁴²

The D.C. Circuit Court of Appeals has noted that “[t]he justification for the rule against segmentation is obvious: it prevent[s] agencies from dividing one project into multiple individual actions each of which individually has an insignificant environmental impact, but which

²³⁷ *Scientists' Inst. for Pub. Info. v. Atomic Energy Comm'n*, 481 F.2d 1079, 1082 (D.C. Cir. 1973).

²³⁸ *See, e.g., Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549 (8th Cir. 2003).

²³⁹ *Birckhead*, 925 F.3d at 518–19.

²⁴⁰ *Burger & Wentz*, *supra* note 11, at 113–14.

²⁴¹ 40 C.F.R. § 1508.25(a)(1).

²⁴² 40 C.F.R. § 1508.27; *Burger & Wentz*, *supra* note 11, at 169.

collectively have a substantial impact.”²⁴³ Similarly, the Ninth Circuit has stated that the purpose of NEPA “cannot be fully served if consideration of the cumulative effects of successive, interdependent steps is delayed until the first step has already been taken.”²⁴⁴ Applying the regulatory standards, courts have held that agencies have a mandatory obligation to conduct a joint review of actions that either have no independent purpose or utility,²⁴⁵ or “the dependency is such that it would be irrational, or at least unwise” to undertake one action if the other(s) were not also undertaken.²⁴⁶

Most of the cases involving claims that an agency failed to review connected actions pertaining to fossil fuels involve claims that an agency has improperly segmented its review of a pipeline (and different pieces of the pipeline), thus failing to evaluate all emissions (and other impacts) from the pipeline in a single, comprehensive review.²⁴⁷ In one noteworthy case, *Delaware Riverkeeper Network v. FERC*, the D.C. Circuit held that four segments of a pipeline project were connected actions because they were physically connected, they were being constructed in relatively the same time period, and they lacked independent utility.²⁴⁸ The pipeline

²⁴³ *Del. Riverkeeper Network v. FERC*, 753 F.3d 1304, 1314 (D.C. Cir. 2014) (citing *NRDC v. Hodel*, 865 F.2d 288, 297 (D.C. Cir. 1988) (internal quotation marks omitted)).

²⁴⁴ *Thomas v. Peterson*, 753 F.2d 754, 760 (9th Cir. 1985).

²⁴⁵ *Custer Cty. Action Ass'n v. Garvey*, 256 F.3d 1024, 1037 (10th Cir. 2001).

²⁴⁶ *Trout Unlimited v. Morton*, 509 F.2d 1276, 1285 (9th Cir. 1974).

²⁴⁷ *See, e.g., Twp. of Bordentown v. FERC*, 903 F.3d 234, 250 (3d Cir. 2018) (two pipelines were not connected actions because they had independent utility); *Sierra Club v. U.S. Army Corps of Eng'rs*, 803 F.3d 31, 51 (D.C. Cir. 2015) (USACE not required to review multiple pipeline segments as connected actions because the other segments did not require federal approvals); *Sierra Club v. Clinton*, 689 F. Supp. 2d 1123, 1133 (D. Minn. 2010) (three pipelines were not connected actions because they had independent utility and different approval timelines); *Hammond v. Norton*, 370 F. Supp. 2d 226, 253 (D.D.C. 2005) (BLM must either review two pipe segments as connected actions or make a more thorough and factually supportable finding of independent utility).

²⁴⁸ *Del. Riverkeeper Network*, 753 F.3d at 1308–09. That decision can be contrasted to *Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers*, where the D.C. Circuit district court held that different federal approvals that were pending for the Dakota Access Pipeline had “substantial independent utility” as “each would allow a portion of pipeline to proceed as planned, while any denial would result in re-routing—with no apparent impact on the other federally regulated components of the project” and thus they did not constitute connected actions which must be reviewed in the same EIS. *Standing Rock Sioux Tribe v. U.S. Army Corps of Eng'rs*, 301 F. Supp. 3d 50, 68–69 (D.D.C. 2018). The court asserted that the “limited federal involvement with [the Dakota Access Pipeline] and the potential for re-routing” distinguished the case from the facts of *Delaware Riverkeeper*—and in particular, because this was an oil pipeline and not a natural gas pipeline, it was “not so beholden to overall federal approval.” *Id.* But the

cases help to clarify some of the specific factors that are relevant to the segmentation analysis, such as whether the allegedly connected actions are subject to federal approval, whether they are occurring at roughly the same time, and whether they are physically connected (this last factor being informative but not dispositive in the analysis).²⁴⁹

The same factors are relevant when determining whether different types of infrastructure or activities within the fossil fuel supply chain (e.g., production and transport) are connected actions that must be reviewed in the same EIS. But the analysis of whether the supply chain components lack “independent utility” is trickier because these components are, in many cases, more interchangeable than pipeline segments.²⁵⁰ Consider, for example, a situation in which the federal government is simultaneously reviewing and issuing approvals for a coal mining lease and a rail project that would transport coal from the mine to end-users. Whether these qualify as connected actions would depend on factors such as whether the coal mining “cannot or will not proceed” without the coal rail project, and whether the coal rail project will service other mines (or transport other goods).²⁵¹ There are only a handful of decisions that directly address the connected actions requirement in this context,²⁵² and two of them were dismissed because the allegedly connected action was not a “federal action” under NEPA.²⁵³ The one case that dealt with two federal approvals, *Myersville Citizens for a Rural Community v. FERC*, involved FERC’s review of an LNG export terminal and a natural gas storage project which

court’s decision in *Standing Rock* was clearly wrong, as it failed to substantiate its assumption that the pipeline would be re-routed in the absence of federal approvals—an assumption which, if applied to other oil pipelines, would render the prohibition against segmentation meaningless.

²⁴⁹ See, e.g., *Del. Riverkeeper Network*, 753 F.3d at 1308–09.

²⁵⁰ *Burger & Wentz*, *supra* note 11, at 170–71.

²⁵¹ 40 C.F.R. § 1508.25.

²⁵² The complaint in *Diné Citizens* also alleged that OSM had violated the requirement to review connected actions in its review of a coal mining proposal when it failed to consider emissions from a connected power plant that would combust the coal, but the reviewing court held that it was unnecessary to reach that argument because it concluded that the combustion-related impacts were indirect effects of the proposal. *Diné Citizens Against Ruining Our Env’t v. U.S. Off. of Surface Mining*, 82 F. Supp. 3d 1201, 1212 (D. Colo. 2015).

²⁵³ *Big Bend Conservation All. v. FERC*, 896 F.3d 418, 424 (D.C. Cir. 2018) (holding that a natural gas pipeline which serviced an LNG terminal was not a connected action because it was not an interstate pipeline subject to federal jurisdiction); *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, 531 F.3d 1220, 1221 (10th Cir. 2008) (holding that the authorization of a natural gas pipeline and “future gas well development” were not connected actions within the meaning of NEPA, because there was no imminent government action to develop natural gas resources that would also require an EIS).

were physically connected and under review by FERC at roughly the same time.²⁵⁴ FERC asserted that the projects were not connected because the additional natural gas storage and transportation capacity associated with the storage project had been “fully subscribed” to other (domestic) uses.²⁵⁵ Petitioners countered that the projects were connected because the storage facility would produce “excess natural gas capacity” that was destined for export through the LNG terminal.²⁵⁶ Relying heavily on FERC’s assertions, the D.C. Circuit Court of Appeals held that the projects were not connected actions because “neither depends on the other for its justification” and the two projects were not “financially and functionally interdependent.”²⁵⁷ This decision illustrates the challenge of establishing a lack of “independent utility” for interconnected fossil fuel supply infrastructure as well as the deference granted to agency conclusions on this issue. It does not entirely foreclose on the application of the rule prohibiting segmentation to other federal approvals, but makes clear that the circumstances in which courts will intervene to enforce this rule are relatively narrow.

C. *Cumulative Emissions from Fossil Fuel Leasing and Transport Approvals*

Another key scoping question confronting federal NEPA reviews of fossil fuel projects is whether agencies must analyze the cumulative effects of decisions involving fossil fuel extraction or transportation. Whereas upstream and downstream emissions analyses look “vertically” at the fossil fuel supply (focusing on emissions associated with the same fuel as it moves from production to transport, processing, and combustion), cumulative emissions analyses look “horizontally” at the aggregate effect of multiple leasing and transportation infrastructure approvals.²⁵⁸ One key difference between these two axes is that there is a causal relationship between different activities on the vertical axis,²⁵⁹ but this is not necessarily the case for activities on the horizontal axis.

There are two provisions in the NEPA regulations that would potentially require an analysis of cumulative emissions in this context:

²⁵⁴ *Myersville Citizens for a Rural Cmty., Inc. v. FERC*, 783 F.3d 1301 (D.C. Cir. 2015).

²⁵⁵ *Dominion Cove Point LNG, LP*, 148 FERC ¶ 61,244 (2014).

²⁵⁶ *Myersville Citizens for a Rural Cmty.*, 783 F.3d at 1326.

²⁵⁷ *Id.*

²⁵⁸ Burger & Wentz, *supra* note 11, at 128.

²⁵⁹ Without each “link” in the fossil fuel supply chain, the fuels would never be produced, transported to markets, or consumed.

(i) the requirement to evaluate cumulative effects, and (ii) the requirement to evaluate “cumulative actions” and “similar actions” in a single review. The precise legal obligations are murky under either framework, as the regulatory language is very broad; the case law under both provisions is sparse. We discuss both frameworks below.

1. Cumulative Emissions as Cumulative Impacts

The NEPA regulations require agencies to evaluate cumulative effects, which result 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.”²⁶⁰ Cumulative effects “can result from individually minor but collectively significant actions taking place over a period of time.”²⁶¹ As with other effects, agencies must take a “hard look” at cumulative impacts and the analysis and data presented should be “useful” to decision makers.²⁶² Such cumulative impacts must be taken into account when assessing the significance of an action’s environmental impacts, and the regulations specify that “significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment.”²⁶³

The cumulative emissions from multiple decisions involving fossil fuel supply projects are precisely the sort of cumulative impact that should be evaluated under NEPA to help serve the twin goals of informed decision-making and public disclosure. There has been a series of decisions involving the federal government’s responsibility to account for the cumulative emissions from fossil fuel leasing and transport approvals, including at least five cases involving production and one involving transportation (the Keystone XL pipeline).²⁶⁴ Generally speaking, courts

²⁶⁰ 40 C.F.R. § 1508.7.

²⁶¹ *Id.*

²⁶² See League of Wilderness Defs.—Blue Mountains Biodiversity Project v. Allen, 615 F.3d 1122, 1135 (9th Cir. 2010); Kern v. U.S. Bureau of Land Mgmt., 284 F.3d 1062, 1075 (9th Cir. 2002).

²⁶³ 40 C.F.R. § 1508.27(b)(7). For more on this point, see *infra* Section III.B.

²⁶⁴ There are at least four pending cases alleging failures to quantify cumulative emissions in the context of oil and gas leasing and the decisions in those cases may help further shape agency obligations in this context. Complaint at 23–24, *S. Utah Wilderness All. v. Bernhardt*, No. 2:19-cv-002660RJS (D. Utah Apr. 19, 2019) (failure to consider cumulative effects of multiple oil and gas leases); Complaint at 33, *Rocky Mountain Wild v. Zinke*, No. 1:18-cv-02468 (D. Colo. Sept. 27, 2018) (BLM failed to take a hard look at cumulative climate impacts “in conjunction with other past, present, and future lease

are deferential to agency decisions about the proper scope of the cumulative impacts analysis because the regulatory requirement is so broadly worded, and agencies must therefore exercise discretion in deciding which past, present, and reasonably foreseeable actions to focus on.²⁶⁵ But there are some examples of judicial intervention—specifically, where an agency has ignored the cumulative emissions of multiple leasing decisions that are simultaneously pending before the agency. Two more specific trends in these cases are (i) some courts have adopted a very narrow definition of what constitutes a “reasonably foreseeable” action, holding that agencies are not required to consider other pending approvals for fossil fuel production until a final EA or EIS has been issued for those approvals and (ii) in several instances, courts have conflated petitioners’ arguments that agencies should evaluate cumulative *emissions* with arguments about the need to evaluate the actual effects of climate change caused by those emissions in the cumulative impacts analysis, and have held that quantification of the cumulative emissions was not required because quantification of actual climate impacts was not feasible. For reasons discussed below, we think courts have erred in both respects.

The D.C. Circuit Court of Appeals addressed the issue of foreseeability in *WildEarth Guardians v. Jewell*. There, plaintiffs argued that BLM’s analysis of GHG emissions from a coal lease was inadequate because BLM failed to consider its cumulative impact along with emissions from eleven other pending lease applications in the Powder River Basin.²⁶⁶ At the time the EIS was prepared, BLM had issued draft EISs for four of the eleven leases; the other seven leases were still in the scoping stage.²⁶⁷ The D.C. Circuit held that the approval of the eleven other leases was not reasonably foreseeable at this stage and thus BLM was not required to evaluate them in its cumulative effects analysis.²⁶⁸ This decision thus set a very high bar for what constitutes a “foreseeable” future action.

sales in the Uinta Basin”); Complaint at 24, *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, No. 4:18-cv-00073 (D. Mont. May 5, 2018) (BLM “failed to quantify cumulative emissions” in oil and gas leasing EA); Complaint at 4, *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, No. 1:18-cv-00987 (D. Colo. Apr. 26, 2018) (failure to account for cumulative effects of multiple oil and gas leases). There are also cases in which petitioners are primarily relying on the “cumulative effects” framework to argue that agencies should take a harder look at the actual impacts of emissions—that is, the impacts of climate change on human and natural systems. As such claims do not implicate the proper scope of the emissions analysis but rather the mode of analysis, we discuss them in Part III.

²⁶⁵ *Kleppe v. Sierra Club*, 427 U.S. 390, 413–14 (1976).

²⁶⁶ *WildEarth Guardians v. Jewell*, 738 F.3d 298, 309 (D.C. Cir. 2013).

²⁶⁷ *Id.* at 310.

²⁶⁸ *Id.*

This rationale for this standard is questionable, especially as applied to pending actions for which a draft EIS or EA has been prepared. The draft document is the final step in the agency review process before the agency commits to a final action,²⁶⁹ and preparing this document requires a considerable commitment of time and resources²⁷⁰—and such, it is a strong indicator that an agency intends to proceed with the action. To illustrate this point, when *WildEarth Guardians v. Jewell* was being tried, BLM had already published EISs for all of the leases, issued Records of Decisions (“RODs”) for three leases, had RODs pending for four leases, and held a sale for one lease.²⁷¹ This is such a narrow interpretation of “reasonably foreseeable future actions” that it almost eliminates the requirement to look at future federal actions altogether. If a proposal for which a draft EIS or EA has been prepared does not qualify as a “foreseeable future action,” then what does? Only actions that have been approved but not yet implemented? This is too lenient an interpretation to support NEPA’s goals of informed decision-making and public disclosure.

That being said, even under this very narrow interpretation, there is ample room for greater disclosure of cumulative emissions from fossil fuel supply projects. This is illustrated by a decision from the D.C. district court in a case involving BLM’s failure to look at the cumulative effects of hundreds of oil and gas leases in Wyoming, Utah, and Colorado. In that case, the court found that BLM had violated NEPA by failing to quantify the aggregate emissions from eleven lease sales encompassing 473 oil and gas leases.²⁷² The court explained that “considering each individual drilling project in a vacuum deprives the agency and the public of the context necessary to evaluate oil and gas drilling on federal land before irretrievably committing to that drilling.”²⁷³ There was no question as to whether the 473 lease sales were “reasonably foreseeable” as the sales had already been issued. But the court also noted, consistent with the D.C. Court of Appeals standard, “[t]o the extent other BLM actions in the region—such as other lease sales—are reasonably foreseeable when an EA is issued, BLM must discuss them as well.”²⁷⁴ The court noted that BLM must “consider these cumulative impacts when assessing the contribution of the leasing program to climate change” even if it

²⁶⁹ See 40 C.F.R. § 1502.1.

²⁷⁰ See 40 C.F.R. § 1502.2–1502.3.

²⁷¹ *WildEarth Guardians*, 738 F.3d at 310.

²⁷² *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 55, 71 (D.D.C. 2019).

²⁷³ *Id.* at 83.

²⁷⁴ *Id.* at 77.

determined that each individual lease sale would have a “de minimis impact on climate change.”²⁷⁵

The three other decisions on the required scope of cumulative emissions analysis for fossil fuel production approvals all illustrate how deferential courts are to agencies on this question. Two of these decisions were issued by the same judge in the Colorado district court.²⁷⁶ In both cases, plaintiffs

contended that NEPA required BLM to evaluate all emissions from its oil and gas leasing approvals in its cumulative impacts analysis.²⁷⁷ The judge disagreed, finding that BLM had taken an appropriately hard look at cumulative impacts by providing a qualitative analysis of climate change and its potential impacts.²⁷⁸ In the later of the two decisions, the judge cited two factors that informed its decision: (i) the general principle of deference to agencies (“it is not the role of the court to decide whether Defendants choices were ideal; I am merely tasked with determining whether Defendants’ analyses met the minimum threshold necessary to constitute a ‘hard look.’”); and (ii) BLM’s determination that it was “impossible to attribute a particular climate impact in any given region to GHG emissions from a particular source” because “tools did not exist that would allow [BLM] to predict how a project’s emissions would impact global, regional, or local climate because, at the time, government agencies did not have standardized protocols or specific levels of significance by which they could quantify climate impacts.”²⁷⁹ While this general principle of deference may be true, it appears that the court’s deference in this context was misplaced insofar as the court was deferring to BLM’s explanation of why it could not quantify climate *impacts* when deciding that BLM was not obligated to quantify cumulative emissions

²⁷⁵ *Id.*

²⁷⁶ *Citizens for a Healthy Cmty. v. U.S. Bureau of Land Mgmt.*, 377 F. Supp. 3d 1223 (D. Colo. 2019); *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, 342 F. Supp. 3d 1145 (D. Colo. 2018).

²⁷⁷ *See, e.g.*, Plaintiffs’ Opening Merits Brief at 16, *Citizens for a Healthy Cmty. v. U.S. Bureau of Land Mgmt.*, 377 F. Supp. 3d 1223 (D. Colo. 2019) (No. 1:17-cv-2519-LTB-GPG).

²⁷⁸ *Citizens for a Healthy Cmty.*, 377 F. Supp. 3d at 1239.

²⁷⁹ *Id.* at 1239.

from BLM leasing. The court's decision did not contain any assessment of whether such quantification would be feasible or and to what extent it was necessary for informed decision-making.

The Montana district court made a similar logical error in an unreported opinion involving BLM's cumulative impact analysis for oil and gas leasing. There, petitioners alleged that BLM should have quantified emissions from the entire mineral estate managed by BLM, or at minimum, eight revised RMPs that were approved by a single ROD on the same date (and thus there was no question about whether they were "foreseeable").²⁸⁰ Petitioners also alleged that BLM should have used the global carbon budget and/or social cost estimates to evaluate the actual impacts of those cumulative emissions (but this was distinct from their claim that quantification was required).²⁸¹ The district court conflated these two arguments in its analysis, finding that "[a]nalysis of the cumulative impacts of climate change would require not only quantification, but a standard by which to measure the impacts," and although plaintiffs presented two possible standards (global carbon budget and social cost metrics), no courts had yet required the use of these tools in that manner.²⁸² At the same time, the district court stated that GHG emissions can be used as a proxy for the consideration of global climate change effects.²⁸³ The reasoning behind this decision is dubious for several reasons. First, the court never explained why quantification of the cumulative emissions from leasing decisions should not be required as a "first step" in the cumulative impact analysis regardless of whether metrics were available to further evaluate the actual impacts of those emissions. Second, despite acknowledging that GHG emissions could themselves serve as a proxy for impacts, the court still held that quantification was not required. Third, if the court was correct that the cumulative effects analysis required an additional "standard by which to measure the impacts," then should not BLM be required to use the tools that were at its disposal (specifically the global carbon budget and the social cost of carbon) to perform a sound cumulative effects analysis? Ultimately, it

²⁸⁰ *W. Org. of Res. Councils v. U.S. Bureau of Land Mgmt.*, No. CV 16-21-GF-BMM, 2018 WL 1475470, at *13 (D. Mont. Mar. 26, 2018), *appeal dismissed*, No. 18-3583618, 2019 WL 141346 (9th Cir. Jan. 2, 2019).

²⁸¹ *Id.* at *14.

²⁸² *Id.* at *13–14.

²⁸³ *Id.* at *18.

appears that the court may have conflated the two arguments presented by the petitioners (that BLM should quantify cumulative emissions from fossil fuel leasing, and that BLM should look at the actual impacts of those cumulative emissions) and thus failed to adequately address the first argument about quantification.

Finally, the one case addressing the requirement to look at cumulative emissions in the transport context was *Indigenous Environmental Network v. U.S. Department of State*, which involved the environmental review for the Keystone XL pipeline.²⁸⁴ There, the Montana district court found that emissions from two transboundary oil pipeline projects that were being reviewed by the State Department at the same time (Keystone XL and Alberta Clipper) must be considered in the cumulative impacts analysis for Keystone XL.²⁸⁵ The two pipeline projects shared a geographic nexus in that they originated in the same region (Alberta oil sands) but transported the oil to very different markets in the United States.²⁸⁶ This decision provides some insight on the minimum requirements for cumulative effects analysis in the pipeline context and suggests that NEPA also requires FERC to consider the emissions from multiple pipeline projects that are undergoing FERC review in its cumulative impacts analysis, particularly pipelines that are located in the same region and/or service the same natural gas production sites or end-user markets.²⁸⁷

2. Cumulative Emissions as Impacts of Cumulative and Similar Actions

The regulatory requirements for analyzing cumulative and similar actions together also provide a basis for arguing that agencies should look at the aggregated effects of multiple fossil fuel extraction and

²⁸⁴ *Indigenous Env'tl. Network v. U.S. Dep't of State*, 347 F. Supp. 3d 561 (D. Mont. 2018).

²⁸⁵ *Id.* at 577–78.

²⁸⁶ *Id.* at 577.

²⁸⁷ Granted, the facts underpinning *Indigenous Environmental Network* were somewhat unique: the State Department had treated the Keystone XL pipeline as a cumulative action in the Alberta Clipper EIS (and had calculated cumulative emissions from the two projects in that EIS), and thus it was irrational to take a different approach in the Keystone XL EIS. *Id.* at 578. But the scope of an agency's cumulative effects (or actions) analysis on one NEPA review should not be a dispositive factor in determining whether an agency has taken an adequately hard look at cumulative effects in another NEPA review. To hold that an agency is *not* required to evaluate certain cumulative effects because it did not evaluate them in a past review would be irrational and would undermine NEPA's core purposes.

transportation proposals. These provisions are useful because they require a more comprehensive review of the combined impacts of multiple federal actions—in effect, a joint EA or EIS that looks at the actions themselves in the aggregate, as opposed to just looking at certain effects in the aggregate.

The CEQ regulations require a joint review of federal actions that “have cumulatively significant impacts and should therefore be discussed in the same impact statement.”²⁸⁸ The regulations also recognize a prohibition of segmentation of reviews for cumulative actions, similar to that recognized for connected actions. Specifically, in the paragraph directing agencies to consider “whether the action is related to other actions with individually insignificant but cumulatively significant impacts,” the regulations state that “[s]ignificance cannot be avoided . . . by breaking [the action] down into small component parts.”²⁸⁹

In contrast, the regulations state that an agency “may wish” to analyze “similar actions” in the same NEPA document—similar actions being defined as those which “have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography” and that an agency “should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement.”²⁹⁰ Due to the more permissive language here, courts have granted considerable deference to agencies’ decisions about whether to prepare a single EIS for similar actions.²⁹¹

Decisions striking down agency reviews due to failure to prepare a joint (or programmatic) EA or EIS for cumulative and similar actions are rare.²⁹² In the 1976 case *Kleppe v. Sierra Club*, the Supreme Court addressed whether the federal government was obligated to prepare a programmatic review for coal leasing in the Great Plains Region.²⁹³ There, the Supreme Court explained that:

A comprehensive impact statement may be necessary in some cases for an agency to meet [its duty to evaluate environmental impacts]. Thus, when several proposals for coal-related actions that will have cumulative or synergistic

²⁸⁸ 40 C.F.R. § 1508.25(a)(2).

²⁸⁹ § 1508.27(b)(7).

²⁹⁰ § 1508.25(a)(3).

²⁹¹ See Burger & Wentz, *supra* note 11, at 173–74.

²⁹² See *id.* at 171–75.

²⁹³ *Kleppe v. Sierra Club*, 427 U.S. 390 (1976).

environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together. Only through comprehensive consideration of pending proposals can the agency evaluate different courses of action.²⁹⁴

However, in that case, the court held that PEIS for the Great Plains Region was not required because (i) all proposals for coal leasing were either national or local in scope (there was no regional development plan in the works), and (ii) the federal government had prepared a nationwide PEIS for a new national coal-leasing policy as well as EISs for proposed local coal leasing actions.²⁹⁵ In this context, the Court held that it was appropriate to defer to the federal government's determination that "the appropriate scope of comprehensive statements should be based on basins, drainage areas, and other factors."²⁹⁶

The Ninth Circuit addressed the narrower question of whether the federal government had improperly piecemealed its analysis of coal mining operating in a particular leasing area in *Cady v. Morton*.²⁹⁷ There, the Ninth Circuit Court of Appeals found that DOI had improperly isolated the impacts of coal leasing activities when it approved coal leases covering 30,876 acres of land and up to twenty years of mining but then prepared an EIS for a mining plan which covered only five years of mining on 770 acres.²⁹⁸ DOI argued that the EIS was appropriate in scope because an EIS need not be prepared covering an entire project when an adequate EIS covering a discrete phase or segment thereof has been prepared, but the court disagreed, explaining that:

While it is true that each mining plan prepared for tracts within the leased area is to a significant degree an independent project which requires a separate EIS with respect to each, it is no less true that the breadth and scope of the possible projects made possible by the Secretary's approval of the leases require the type of comprehensive study that NEPA mandates adequately to inform the Secretary of the possible environmental consequences of

²⁹⁴ *Id.* at 409–10.

²⁹⁵ *See id.* at 399–401.

²⁹⁶ *Id.* at 414.

²⁹⁷ *Cady v. Morton*, 527 F.2d 786 (9th Cir. 1975).

²⁹⁸ *See id.* at 794–96.

his approval. Westmoreland's massive capital investment and extended contractual commitments present a situation in which "it would be irrational, or at least unwise, to undertake the first phase if subsequent phases were not also undertaken." However, even were this not true, it cannot be denied that the environmental consequences of several strip mining projects extending over twenty years or more within a tract of 30,876.45 acres will be significantly different from those which will accompany Westmoreland's activities on a single tract of 770 acres.²⁹⁹

This case was decided before the CEQ regulations were promulgated and thus the court did not discuss whether these were "connected," "cumulative," or "similar" actions under 40 C.F.R. § 1508.25—but the analysis here suggests that the actions had some characteristics of connected actions but would best be characterized as "cumulative" or "similar" actions under the current regulations as they had a "significant degree" of independent utility.³⁰⁰

Federal approvals for fossil fuel production and transportation can be characterized as both "cumulative" and "similar" actions—most of these approvals have independent utility,³⁰¹ but these actions have "similarities which provide a basis for evaluating their consequences together" as well as "cumulatively significant effects" on fossil fuel use and the corresponding emissions. NEPA's twin aims of informed decision-making and public disclosure would also be best served through a comprehensive assessment.

However, as noted above, courts tend to be deferential to agency decisions about the scope of their NEPA assessments for cumulative and similar actions. One important factor is whether there is a statutory mandate compelling the agency to prepare and/or periodically update a national or regional program, which would in turn trigger NEPA review of the program. For example, the Outer Continental Shelf Lands Act requires BOEM to prepare five-year programs for offshore leasing covering broad geographic areas, and it would be plainly arbitrary and capricious for BOEM to forgo a programmatic NEPA analysis of those five-year programs.³⁰²

²⁹⁹ *Id.* at 795 (internal citations omitted).

³⁰⁰ *See id.*; 40 C.F.R. § 1508.25.

³⁰¹ As discussed in Section II.B.1, authorized projects which lack independent utility would best be analyzed under the "connected actions" framework.

³⁰² Outer Continental Shelf Lands Act, 43 U.S.C. § 1344(a).

But there is no comparable requirement for onshore leasing or for fossil fuel transportation infrastructure. Prior to authorizing fossil fuel development on public lands, agencies are required to prepare RMPs,³⁰³ but these plans cover much smaller geographic units than the outer continental shelf (“OCS”) five-year program documents (and in many cases have not been updated with an analysis of potential GHG emissions from fossil fuel leasing). The result is that agencies are approving fossil fuel supply projects without any programmatic analysis on the cumulative effect of multiple approvals across broad geographic regions.³⁰⁴

Two other lawsuits challenging the federal government’s failure to conduct an updated programmatic review of the federal coal leasing program to address climate impacts, among other things, are relevant.

In *Western Organization of Resource Councils v. Zinke*, the D.C. Circuit Court of Appeals held that BLM was not required to update the PEIS for the federal coal leasing program as there was no new proposal requiring NEPA review.³⁰⁵ The “action” at issue in this case was the 1979 PEIS for the federal coal leasing program, and plaintiffs argued that this needed to be updated to reflect significant new information about climate change.³⁰⁶ The D.C. Circuit noted that plaintiffs had raised a “compelling argument” for BLM to re-evaluate the federal coal leasing program in light of climate change concerns, but held that the action contemplated in the 1979 PEIS had been completed in 1979 and no new nationwide action had been proposed.³⁰⁷ The court suggested that the plaintiffs might pursue these claims through an alternate approach:

Appellants may, when appropriate, challenge specific licensing decisions on the ground that the EIS prepared in support of any such decision fails to satisfy NEPA’s mandate to consider the cumulative environmental impacts of coal leasing. Such a claim might challenge any attempt by

³⁰³ See 43 C.F.R. § 1610.

³⁰⁴ While this may have been understandable at an earlier point in time, when adverse environmental effects were understood to be relatively local, or regional in some instances, at this point agencies understand that the GHG emissions from these approvals have a global effect and can be analyzed on a regional or nationwide basis. Congress could address this gap through legislation requiring programmatic reviews, but in the absence of congressional action, NEPA requirements can play a role in compelling such analysis. See *supra* Section I.C.

³⁰⁵ *W. Org. of Res. Councils v. Zinke*, 892 F.3d 1234, 1245–46 (D.C. Cir. 2018).

³⁰⁶ *Id.* at 1236–37.

³⁰⁷ *Id.* at 1244–45.

BLM to rely on (or tier to) the 1979 PEIS on the ground that it is too outdated to support new federal action.³⁰⁸

The court noted that such a lawsuit was not foreclosed by its decision in *WildEarth Guardians v. Jewell* (holding that eleven pending coal leases were not reasonably foreseeable), because that case did not involve any allegations about improperly tiering to an outdated PEIS.³⁰⁹

In *Citizens for Clean Energy v. U.S. Department of the Interior*, the Montana district court held that the Trump administration's decision to terminate the federal coal leasing moratorium was a major federal action with environmental implications requiring some form of NEPA review.³¹⁰ The court did not go so far as to require a PEIS but rather directed DOI to consider what form of NEPA documentation would be required for this action.³¹¹ Granted, neither of these two decisions on the federal coal leasing program address whether there are "cumulative" or "similar" actions that must be reviewed in a joint PEIS—rather, they deal with whether there is a major federal proposal that triggers NEPA requirements—but they do bear on agency obligations to evaluate the cumulative effects of coal leasing decisions on a nationwide basis.

Two notable decisions address agency obligations to review connected, cumulative, or similar actions involving fossil fuel supply in the same EIS,³¹² but both decisions were more limited in scope insofar as they dealt with only two potentially related actions of the same sort. In one case, a federal court found that emissions from two oil pipelines must

³⁰⁸ *Id.* at 1244.

³⁰⁹ *Id.* at 1245.

³¹⁰ *Citizens for Clean Energy v. U.S. Dep't of the Interior*, 384 F. Supp. 3d 1264, 1271, 1279 (D. Mont. 2019).

³¹¹ *Id.* at 1281.

³¹² There are also at least two pending cases alleging that oil and gas leases sales were "cumulative actions" that should be reviewed in the same EIS due to their cumulatively significant impacts, and that BLM unlawfully segmented its analysis of the sales into multiple EAs thus underplaying the significance of the impacts. These complaints deal with approved oil and gas lease sales, thus avoiding the need to demonstrate that a pending sale is "reasonably foreseeable." The two pending cases alleging improper segmentation of oil and gas leasing EAs also allege inadequate analysis of cumulative effects, and it remains to be seen whether the courts will resolve these under the cumulative impacts framework (requiring supplementation of the existing EAs) or cumulative actions framework (requiring preparation of a comprehensive EIS). Complaint at 27, 30–31, *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, No. 4:18-cv-00073 (D. Mont. May 15, 2018); Complaint at 76–77, *W. Watersheds Project v. Zinke*, No. 1:18-cv-00187 (D. Idaho Apr. 30, 2018).

be reviewed as cumulative impacts and also described these two projects as “cumulative actions”—but because the analysis focused on the requirements for assessing cumulative impacts rather than actions and the remedy was to update the cumulative impacts analysis for the one project, the decision does not provide much guidance on the question of when a joint EIS is required for cumulative actions.³¹³ In another case, a federal court held that BLM had not improperly piecemealed its analysis in a coal lease EA when it failed to prepare a comprehensive EIS encompassing (i) another mining plan modification that would expand the mine by another 498 acres and 48 million tons of coal and (ii) an application for another coal lease at the mine that would add 1,600 acres and 198 million more tons of coal to the mine.³¹⁴ The court reasoned that the plan modification was not a “reasonably foreseeable future action” at the time the EA was prepared because there it was only a pending application that had not yet been approved.³¹⁵ As discussed above, the rationale for adopting such a narrow definition of foreseeability is questionable—the entire purpose of the provisions directing agencies to review cumulative and similar actions in the same EIS is to facilitate consideration of the combined effects of those actions *before* an agency makes a final decision. Limiting the analysis of cumulative and similar actions to actions which have already been approved completely undermines this purpose.

III. THE ADEQUACY OF GHG EMISSIONS ANALYSIS FOR FOSSIL FUEL SUPPLY PROJECTS

As questions about the proper scope of review for direct, indirect, and cumulative GHG emissions from fossil fuel supply projects are resolved, new questions naturally arise about the adequacy and reasonableness of agencies’ calculations, disclosures, and determinations of the significance of GHG impacts. This section explores four key areas for environmental impact assessment of these projects: (i) the net impact of the proposal on fossil fuel use and corresponding emissions (i.e., the “energy

³¹³ *Indigenous Env'tl. Network v. U.S. Dep't of State*, 347 F. Supp. 3d 561, 578 (D. Mont. 2018).

³¹⁴ *WildEarth Guardians v. Zinke*, No. 1:17-cv-0080, 2019 WL 2404860, at *13 (D. Mont. Feb. 11, 2019); Complaint at 17, *WildEarth Guardians v. Zinke*, No. 1:17-cv-0080 (D. Mont. June 8, 2017).

³¹⁵ *WildEarth Guardians*, No. 1:17-cv-0080, 2019 WL 2404860, at *5, *13. Oddly, the court did not address whether the other coal lease application was reasonably foreseeable, but this narrow definition of “foreseeable future action” would presumably exclude that pending application as well.

market analysis”); (ii) non-CO₂ emissions such as methane; (iii) the significance of GHG emissions; and (iv) alternatives and mitigation options to reduce GHG emissions. In reviewing the adequacy of environmental reviews, courts tend to be deferential to agencies, particularly as compared with situations where agencies have wholly omitted an impact from the scope of their review. Yet, judicial discretion to agency expertise only goes so far, and where an agency has clearly stepped outside the realm of reasonable analysis, it is proper for a court to intervene.

A. *Energy Market Impacts and Net Emissions*

In assessing upstream and downstream GHG emissions of federally approved fossil fuel supply projects, agencies may seek to understand the net emissions impact of the proposal based on an assessment of how the projected increase in fossil fuel production or transport capacity will affect broader patterns of energy production and consumption. The net emissions analysis is essentially a comparison between emissions under the “no action” and “action” alternatives, although it is not always framed as such.³¹⁶ One approach to this analysis is to deflect it with a “perfect substitution” argument; that approach is born of faulty logic and has been roundly rejected by the courts. Another approach involves employing energy market models to quantify emissions effects; however, in some instances agencies have concluded that it is impossible to accurately project such effects, in others they have conducted analyses that put a thumb on the scale, and in others they have undertaken more rigorous analyses. The critical question is whether agencies are adequately supporting their findings, one way or the other. The validity of agency findings on energy substitution and net emissions depends on the nature of the proposal. The nationwide federal coal leasing program, for example, presumably has a much larger effect on net emissions than the approval of an individual pipeline. But even a single pipeline or lease approval may have some effect on fossil fuel prices and markets. Recognizing this, courts have flatly rejected “perfect substitution” in the context of coal leases and coal railways, and have made it clear that perfect substitution claims for other types of proposals must be supported by adequate analysis.³¹⁷ And

³¹⁶ Courts have held that it is reasonable to use several different scenarios to frame the “no action” alternative where there is uncertainty about energy markets and substitution. *See, e.g.,* *Indigenous Envtl. Network v. U.S. Dep’t of State*, 347 F. Supp. 3d 561, 574–75 (D. Mont. 2018).

³¹⁷ *See* Section II.A.1.

this is exactly what many agencies have begun doing: incorporating models and quantitative analysis into their NEPA documentation to support their findings on energy market substitution, and in some cases finding that the project will have little or no net impact on emissions. Agency arguments about energy market substitution can be difficult to parse because (i) the assumptions and calculations often are not fully disclosed in the NEPA documentation and can be easily manipulated to achieve an intended result; (ii) there is so much uncertainty in the results that it is difficult if not impossible to definitively say that an agency reached the wrong conclusion; and (iii) courts are deferential to agencies on such technical issues. There may be instances where the analysis of energy market impacts is so egregiously flawed that a court will remand the issue back to the agency for supplementation or revision of the analysis, but where agencies can show their math they often pass the test.

1. Fossil Fuels and “Perfect Substitution”

Federal courts have rejected perfect substitution arguments as irrational and/or unsubstantiated in a number of cases involving both fossil fuel production and transportation infrastructure. As a threshold matter, agencies cannot rely on unsupported assumptions of perfect substitution as a justification for ignoring downstream GHG emissions.³¹⁸ As the court in *High Country Conservation Advocates* explained, this assumption was “illogical” in the context of a coal lease approval because the production of coal resulting from the proposed action would “increase the supply of cheap, low-sulfur coal” and “this additional supply will impact the demand for coal relative to other fuel sources, and coal that otherwise would have been left in the ground will be burned.”³¹⁹ Similarly, in *Mid States Coalition v. Surface Transportation Board*, the Eighth Circuit Court of Appeals held that downstream emissions must be disclosed in the context of a coal railway because the increase in coal transportation capacity would affect the price of coal relative to other energy sources and this would affect patterns of coal production and consumption.³²⁰ In *Sierra*

³¹⁸ As discussed below, the D.C. Circuit Court of Appeals’ decision in *Birckhead v. FERC* raises questions about whether courts will defer to perfect substitution arguments as a justification for ignoring *upstream* emissions in the context of fossil fuel transportation approvals. See *supra* notes 215–23.

³¹⁹ *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1197–98 (D. Colo. 2014).

³²⁰ *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549–50 (8th Cir.

Club v. FERC, the D.C. Circuit Court of Appeals rejected FERC's argument that it need not quantify combustion emissions in the context of a natural gas pipeline review because some of the natural gas would replace dirtier fossil fuels, thus offsetting the project's emissions estimates.³²¹ The court found that a purely qualitative analysis of substitution was inadequate because "[a]n agency decisionmaker reviewing this EIS would . . . have no way of knowing whether total emissions, on net, will be reduced or increased by this project, or what the degree of reduction or increase will be."³²²

It is also arbitrary and capricious for agencies to estimate downstream emissions for the proposed action but then claim that the emissions impact will be identical under the "no action" alternative due to perfect substitution.³²³ In one case involving an EA where OSM estimated downstream emissions from coal leasing but declined to estimate the social costs of those emissions based on its conclusion that the leasing program would have no effect on emissions due to substitution, the reviewing court explained that:

This conclusion is illogical, and places the Enforcement Office's thumb on the scale by inflating the benefits of the action while minimizing its impacts. It is the kind of "[i]naccurate economic information" that "may defeat the purpose of [NEPA analysis] by impairing the agency's consideration of the adverse environmental effects and by skewing the public's evaluation of the proposed agency action."³²⁴

2003). On remand, STB prepared an EIS in which it modelled the effects of the coal railway on coal production and use, and petitioners challenged the supplemental analysis on the grounds that STB continued to rely on the assumption that "not all of the . . . transported coal would represent new combustion, that some would be simply a substitute for existing coal supplies." *Mayo Found. v. Surface Transp. Bd.*, 472 F.3d 545, 556 (8th Cir. 2006). But the Eighth Circuit upheld STB's review as the conclusions about market substitution were supported by quantitative analysis and energy market models. *Id.*

³²¹ *Sierra Club v. FERC*, 867 F.3d 1357 (D.C. Cir. 2017) (qualitative discussion of substitution not adequate).

³²² *Id.* at 1375.

³²³ *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, 870 F.3d 1222, 1235–36 (10th Cir. 2017); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 75 (D.D.C. 2019); *Mont. Env'tl. Info. Ctr. v. U.S. Off. of Surface Mining*, 274 F. Supp. 3d 1074, 1103 (D. Mont. 2017).

³²⁴ *Mont. Env'tl. Info. Ctr. v. U.S. Off. of Surface Mining*, 274 F. Supp. 3d 1074, 1098 (D. Mont. 2017) (internal citations omitted). Notably, in an EA prepared on remand, OSM revised its annual production and emissions estimates downwards (from 23.16 million tons to 13.1 million tons CO₂ / year) even though the scope and duration of the action had not

Another decision which also involved OSM's review of coal mining impacts held that this rule was also applicable where OSM had declined to estimate the social costs of emissions because it was uncertain whether emissions would actually be reduced under the no action alternative due to the possibility of energy market substitution. While OSM had shifted its position from "no impact" to "uncertain impact" due to substitution, the court found that this was still "arbitrary and capricious" because the "alternative source substitution assumption is not supported by any market data, even though modeling systems exist to evaluate market effects of changes in coal supply."³²⁵

In addition, agencies cannot justify claims of perfect substitution by relying on incomplete or irrational analysis of energy markets. This was the focus of the Tenth Circuit Court of Appeals' decision in *WildEarth Guardians v. Bureau of Land Management*, which contained one of the most detailed assessments of an agency's perfect substitution argument to date. That case involved BLM's EIS for coal leases that would have extended the life of two coal mines (the "Wright Area" mines) that accounted for nearly 20 percent of U.S. annual domestic coal production.³²⁶ BLM had quantified downstream emissions from combustion of the coal (approximately 382 million tons of annual CO₂ emissions—roughly 6 percent of U.S. total 2008 emissions) but concluded that the same amount of coal would be sourced from elsewhere if it did not approve the proposed leases and thus there was no difference between the proposed action and the no action alternative with respect to coal production and consumption.³²⁷ Thus, as noted by the court, the issue was not that BLM had completely ignored the effects of increased coal consumption, but rather that it had analyzed them irrationally.³²⁸

The court found that BLM's "long logical leap presumes that either the reduced supply will have no impact on price, or that any increase in

changed and the total projected production of "saleable" coal had actually increased from eighty million tons to 86.8 million tons, and then replaced the statement about perfect substitution with a claim that the proposal would have a "very small impact" on emissions. This illustrates how easily agencies can adjust their quantitative analysis to achieve an intended result. See OFF. OF SURFACE MINING, U.S. DEP'T OF THE INTERIOR, BULL MOUNTAINS MINE NO. 1 FEDERAL MINING PLAN MODIFICATION ENVIRONMENTAL ASSESSMENT 2-9, 4-3 (2015); OFF. OF SURFACE MINING, U.S. DEP'T OF THE INTERIOR, BULL MOUNTAINS MINE NO. 1 FEDERAL MINING PLAN MODIFICATION ENVIRONMENTAL ASSESSMENT 18, 57-58 (2018).

³²⁵ *WildEarth Guardians v. Zinke*, No. 1:17-cv-00080, 2019 WL 2404860, at *11.

³²⁶ *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, 870 F.3d 1222, 1226-27 (10th Cir. 2017).

³²⁷ *Id.* at 1228.

³²⁸ *Id.* at 1237.

price will not make other forms of energy more attractive and decrease coal's share of the energy mix, even slightly" and found that this assumption lacked any support in the administrative record.³²⁹ The court explained:

BLM did not point to any information (other than its own unsupported statements) indicating that the national coal deficit of 230 million tons per year incurred under the no action alternative could be easily filled from elsewhere, or at a comparable price. It did not refer to the nation's stores of coal or the rates at which those stores may be extracted. Nor did the BLM analyze the specific difference in price between PRB coal and other sources; such a price difference would effect [sic] substitutability.³³⁰

The court also noted that BLM's assumption was contradicted by one of the principle resources on which it relied: the EIA's 2008 Energy Outlook. While the report generally predicted an increase in coal production, it also found that different assumptions for coal mining and transportation costs affected delivered coal prices and demand, and that higher coal costs resulted in much lower U.S. coal consumption.³³¹ Thus, the court found that "the [EIA] report supports what one might intuitively assume: when coal carries a higher price, for whatever reason that may be, the nation burns less coal in favor of other sources."³³² The court held that BLM's "blanket assertion that coal would be substituted from other sources, unsupported by hard data[,]” did not provide sufficient information to permit a reasoned choice between the preferred alternative and the no action alternative.³³³ In addition, the court noted that, even if BLM had hard data to support this statement, "we would still conclude this perfect substitution assumption arbitrary and capricious because the assumption itself is irrational (i.e., contrary to basic supply and demand principles)."³³⁴ The court concluded that it was "an abuse of discretion" to rely on such a baseless economic assumption to distinguish between the no action and preferred alternatives.³³⁵

³²⁹ *Id.* at 1229.

³³⁰ *Id.* at 1234.

³³¹ *Id.* at 1234–35.

³³² *WildEarth Guardians*, 870 F.3d at 1235.

³³³ *Id.*

³³⁴ *Id.* at 1236.

³³⁵ *Id.* at 1237–38.

Another key takeaway from *WildEarth Guardians v. Bureau of Land Management* is that perfect substitution claims are readily distinguishable from other types of agency assumptions that warrant judicial deference. The primary authority on this issue is the Supreme Court's decision in *Baltimore Gas & Electric Co. v. NRDC*, which upheld the Nuclear Regulatory Commission's ("NRC") conclusion that permanent nuclear waste storage would not have a significant environmental impact, which was based on the Commission's assumption that waste repositories would perform perfectly.³³⁶ There, the Supreme Court deferred to NRC's assumption because (1) it had a limited purpose in the overall environmental analysis (i.e., it was not the key to deciding between two alternatives); (2) overall, the agency's estimation of the environmental effects was overstated, so this single assumption did not determine the overall direction the NEPA analysis took; and (3) courts are most deferential to agency decisions based not just on "simple findings of fact," but in the agency's "special expertise, at the frontiers of science."³³⁷

Applying those factors to BLM's perfect substitution assumption, the Tenth Circuit Court of Appeals found that:

Here, the BLM's substitution assumption appears to be quite different from the Commission's zero release assumption under the three factor analysis in *Baltimore Gas*. First, the BLM's perfect substitution assumption was key to the ultimate decision to open bidding on the leases. In each of the four RODs, the "Reasons for Decision" section first discusses the leases' effect on coal combustion in the nation overall, then lists the other facts that influenced its decision in bullet points. In each ROD, the discussion opens with the assertion that: "Denying this proposed coal leasing is not likely to affect current or future domestic coal consumption used for electric generation." Prioritizing the carbon emissions and global warming analysis in the RODs suggests that this question was critical to the decision to open the leases for bidding. Prioritizing the perfect substitution assumption within that analysis suggests it was critical to deciding between two alternatives: whether or not to issue the leases. The perfect substitution assumption

³³⁶ *Balt. Gas & Electric Co. v. NRDC*, 462 U.S. 87, 103 (1983).

³³⁷ *Id.* at 102-04.

was more than a “mere flyspeck” in the BLM’s NEPA analysis.

Second, the BLM’s carbon emissions analysis seems to be liberal (i.e., underestimates the effect on climate change). The RODs assume that coal will continue to be a much used source of fuel for electricity and that coal use will increase with population size. We do not owe the BLM any greater deference on the question at issue here because it does not involve “the frontiers of science.” The BLM acknowledged that climate change is a scientifically verified reality. Climate science may be better in 2017 than in 2010 when the FEIS became available, but it is not a scientific frontier as defined by the Supreme Court in *Baltimore Gas*, i.e., as barely emergent knowledge and technology. Moreover, the climate modeling technology exists: the NEMS program is available for the BLM to use.³³⁸

Although the court remanded to the agency to modify and supplement its analysis, it declined to specify the exact approach that BLM must take. The court held that: “NEPA does not require agencies to adopt any particular internal decisionmaking structure”³³⁹ and that “[c]hoosing not to adopt a modeling technique does not render the BLM’s EIS arbitrary and capricious; its irrational and unsupported substitution assumption does.”³⁴⁰

Most of the case law addressing perfect substitution claims as applied to downstream emissions is consistent with the principles described above.³⁴¹ In sum, courts have rightfully rejected perfect substitution

³³⁸ *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, 870 F.3d 1222, 1236–37 (10th Cir. 2017).

³³⁹ *Id.* at 1238 (citing *Balt. Gas*, 462 U.S. at 100).

³⁴⁰ *WildEarth Guardians*, 870 F.3d at 1238.

³⁴¹ There is one unpublished opinion from the D.C. Circuit Court of Appeals that does not fully reflect these same principles. That case involved a situation similar to that which has arisen in the context of coal leases. FERC quantified downstream emissions for a proposed pipeline project but then stated that: (i) actual emissions would be fully offset by other sources of natural gas, resulting in no change in GHG emissions, and (ii) the downstream effects are “not reasonably foreseeable” and “not indirect impacts” and the commission was merely quantifying downstream emissions “outside the scope of [its] NEPA analysis.” Petitioners claimed that this was not an adequate assessment of downstream impacts. The D.C. Circuit, however, held that it was not necessary to consider Petitioner’s arguments about whether an increase in downstream emissions was foreseeable

arguments in the context of both fossil fuel production and transportation approvals. However, FERC has nonetheless relied on unsubstantiated perfect substitution arguments as the basis for either excluding upstream and downstream emissions from its environmental reviews or else discounting their importance in its significance analysis. There have been a number of lawsuits pending against FERC due to this practice.³⁴² FERC's position has been that "a causal relationship sufficient to warrant Commission analysis of the non-pipeline activity [i.e., production and consumption] as an indirect impact would only exist if the proposed pipeline would transport new production from a specified production area and that production would not occur in the absence of the proposed pipeline (i.e., there will be no other way to move the gas)."³⁴³ FERC has simultaneously argued "it is unknown—and virtually unknowable—whether the gas to be transported on [a specific pipeline] will come from new or existing production" and "absent that basic information, it is nearly impossible to assess whether there will be any additional production activities in connection with the gas to be transported on the Project."³⁴⁴ In addition, FERC maintains that, "even accepting, *arguendo*, that a specific pipeline project will cause natural gas production, we have

because "FERC provided an estimate of the upper bound of emissions resulting from end-use combustion." Thus, the court upheld FERC's analysis without really confronting whether FERC's conclusions about perfect substitution were reasonable or supported by the record. *See Appalachian Voices v. FERC*, No. 17-1271, 2019 WL 847199 (D.C. Cir. Feb. 19, 2019).³⁴² Several of these lawsuits challenge unsubstantiated assumptions from FERC about the effect of pipeline authorizations on fossil fuel production and consumption, including assumptions that pipeline development does not induce upstream natural gas production (or downstream consumption) and assumptions that pipeline development may actually reduce emissions by offsetting the use of higher carbon emitting fuels such as coal and fuel oil. *See, e.g., Del. Riverkeeper Network v. FERC*, No. 18-1128 (D.C. Cir. May 8, 2018); *Allegheny Def. Project v. FERC*, No. 17-1098 (D.C. Cir. Mar. 23, 2017); *Catskill Mountainkeeper, Inc. v. FERC*, No. 16-345 (2d Cir. Feb. 5, 2016). A lawsuit has also been filed against the U.S. Army Corps of Engineers (USACE) for authorizing activities required for the construction of an oil pipeline without conducting a NEPA analysis to evaluate, among other things, "the climate impacts of 'locking in' future reliance on fossil fuels with a massive infrastructure investment." Complaint at 23, *Atchafalaya Basinkeeper v. U.S. Army Corps of Eng'rs*, 715 Fed. Appx. 399 (5th Cir. 2018) (No. 18-30257). There are also numerous administrative challenges involving FERC's failure to quantify/disclose. *See Dominion Transmission, Inc.*, 163 FERC ¶ 61,128 (2018); *Atl. Coast Pipeline, LLC*, 161 FERC ¶ 61,042 (2017); *Algonquin Gas Transmission*, 161 FERC ¶ 61,255 (2017).

³⁴³ Petition for Review at 72, *N.J. Div. of Rate Counsel v. FERC*, No. 18-1233 (3d Cir. Sept. 4, 2019).

³⁴⁴ Pamela King, *Climate impacts are 'virtually unknowable'—FERC*, E&ENews (Jan. 28, 2019), <https://www.eenews.net/stories/1060118701/print> [<https://perma.cc/GL79-3XNZ>].

found that the potential environmental impacts resulting from such production are not reasonably foreseeable.”³⁴⁵

FERC’s position with respect to both upstream and downstream emissions is untenable.³⁴⁶ Granted, courts have not specifically accepted or rejected perfect substitution claims as applied to *upstream* emissions from natural gas transportation infrastructure,³⁴⁷ and the D.C. Circuit deferred to FERC’s conclusion that it lacked the information necessary to determine whether an increase in natural gas transportation capacity would cause an increase in natural gas production in *Birckhead v. FERC* (which is very similar to arguments that were rejected by other courts).³⁴⁸ But in that case, the D.C. Circuit also stated that FERC was “wrong to suggest that downstream emissions are not reasonably foreseeable simply because the gas transported by the Project may displace existing natural gas supplies or higher-emitter fuels” and described this position as a “total non-sequitur.”³⁴⁹ The same finding should apply to upstream emissions.

For reasons discussed in Parts I and II, we believe that the differential treatment of upstream and downstream emissions in reviews for fossil fuel transportation projects is illogical: if the project causes an increase in consumption of a fuel, then there must be a corresponding increase in production of that fuel. Courts should therefore apply the same scrutiny to perfect substitution arguments used to justify omitting upstream emissions from the analysis.

2. Energy Market Analysis and GHG Emissions

In response to judicial decisions, agencies have also shown some greater reliance on energy market models to quantitatively estimate

³⁴⁵ Petition for Review at 73, *N.J. Div. of Rate Counsel*, No. 18-1233.

³⁴⁶ The effect of natural gas transportation projects and consumption is reasonably foreseeable, and tools are available to estimate the effect of increasing natural gas transport capacity on fossil fuel production and consumption and the corresponding emissions. If FERC uses these tools and finds that a natural gas transportation project will have no impact on natural gas production or consumption because the gas will simply be transported via different channels, then this raises an important question about how FERC can justify a finding of public need for the pipeline project.

³⁴⁷ The Ninth Circuit Court of Appeals did require consideration of upstream emissions in *Northern Plains Resource Council, Inc.* However, because petitioners argued that upstream emissions should be evaluated as cumulative rather than indirect effects, the court did not confront questions pertaining to causation and perfect substitution. *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1082 (9th Cir. 2011).

³⁴⁸ *Birckhead v. FERC*, 925 F.3d 510, 515 (D.C. Cir. 2019).

³⁴⁹ *Id.* at 518.

energy substitution and net emissions impacts. The highly technical nature of these energy market analyses stand in contrast to the blunt instrument of “perfect substitution” arguments and may well warrant more deference from the courts. Thus far, there have been at least three cases in which courts have issued decisions on the adequacy of such analyses,³⁵⁰ as well as a number of undecided cases which will further reinforce and shape agency obligations in this context.³⁵¹

There are several interrelated questions pertaining to the legal adequacy of agencies’ energy market analyses: (i) whether the agency has made reasonable assumptions about the technical parameters used to project energy prices, demand, and consumption; (ii) whether and under what circumstances the agency has a duty to update or supplement its analysis to reflect new developments such as changes in climate policy; and (iii) whether the analysis is sufficiently tailored to the proposal under review. The latter two questions are most likely to arise where an agency has tiered its analysis to an earlier programmatic review.

Regarding the reasonableness of technical parameters, agencies must use parameters that are reasonably close to real-world conditions in their energy market models in order to generate findings that are accurate enough to support informed decision-making. Courts have only begun to define what is “reasonable” in this context with decisions addressing the adequacy of assumptions pertaining to energy substitutes and energy price and demand forecasts.

As a threshold issue, we argue that the inclusion of non-fossil fuel energy resources (particularly renewable energy) as potential energy substitutes is essential for an accurate analysis. Excluding other energy sources from the analysis is tantamount to assuming that we inhabit a world where fossil fuels are the only energy sources, and this assumption inevitably leads to underestimation of the effects of fossil fuel supply. Consider a proposal to increase natural gas supply: such a proposal would almost certainly decrease GHG emissions in a world where fossil fuels are the only energy source (as natural gas displaces higher emitting coal), but may actually increase GHG emissions in a world with other energy

³⁵⁰ *Sierra Club v. U.S. Dep’t of Energy*, 867 F.3d 189 (D.C. Cir. 2017); *High Country Conservation Advocates v. U.S. Forest Serv.*, 333 F. Supp. 3d 1107 (D. Colo. 2018); *Indigenous Env’tl. Network v. U.S. Dep’t of State*, 347 F. Supp. 3d 561 (D. Mont. 2018).

³⁵¹ *See* Complaint, *Healthy Gulf v. Bernhardt*, No. 1:19-cv-00707 (D.D.C. Mar. 13, 2019) (challenging BOEM’s analysis as well); Complaint, *Gulf Restoration v. Zinke*, No. 1:18-cv-01674 (D.D.C. July 16, 2018) (challenging BOEM’s analysis of energy market impacts from Gulf Leasing Program); *see also* challenges to FERC reviews, *supra* note 342 (pending perfect substitution cases noted above).

resources (as natural gas may displace zero-emitting renewable energy sources). There are a number of models available which account for the effects on renewables, many of which have been used by agencies in environmental reviews and regulatory impact analyses,³⁵² and it would therefore be arbitrary and capricious for agencies to use a model which does not account for those effects.

We recognize that this position is at odds with the only decision on the matter—specifically, the D.C. Circuit Court of Appeals’ decision in *Sierra Club v. U.S. Department of Energy*.³⁵³ That case involved DOE’s obligation to evaluate and disclose indirect emissions from LNG exports.³⁵⁴ DOE had relied on EIA studies projecting how LNG exports affect energy markets and also commissioned a report from the National Energy Technology Laboratory (“NETL”) on the life-cycle greenhouse gas emissions of LNG exports.³⁵⁵ The NETL report assessed the life-cycle emissions (production, transportation, consumption) of exported natural gas and compared these with emissions from electricity generated from coal or other sources of gas but did not consider possible substitution by alternative energy sources such as renewables.³⁵⁶ The plaintiffs contended that the review was fatally flawed due to DOE’s failure to account for the possibility that U.S. LNG exports would compete with renewable energy sources which are already quite prevalent in some of the regions where the LNG exports would be consumed (Europe and Asia).³⁵⁷ The D.C. Circuit barely addressed this aspect of the plaintiff’s argument—it merely concluded, in a cursory fashion, that it must defer to DOE’s determination that adding other variables to the analysis would be too difficult and the results of the analysis would be too speculative to help inform decision-making.³⁵⁸ For the reasons noted above, we believe that this is the wrong outcome.

Agencies must also use reasonable forecasts for energy prices and demand. There are two decisions that address what is “reasonable” in this context, both of which also addressed the question of whether and

³⁵² See PETER H. HOWARD, INST. FOR POL’Y INTEGRITY, THE BUREAU OF LAND MANAGEMENT’S MODELING CHOICE FOR THE FEDERAL COAL PROGRAMMATIC REVIEW 1 (2016), https://policyintegrity.org/files/publications/BLM_Model_Choice.pdf [<https://perma.cc/Q7WC-XX3T>] (discussing different energy market models that could be used in programmatic analysis of federal coal leasing program).

³⁵³ *Sierra Club v. U.S. Dep’t of Energy*, 867 F.3d at 192.

³⁵⁴ *Id.* at 195.

³⁵⁵ *Id.* at 195–96.

³⁵⁶ *Id.*

³⁵⁷ *Id.* at 196.

³⁵⁸ *Id.* at 202.

under what circumstances supplementation of an EIS is required to reflect new information. The NEPA regulations require supplementation if an “agency makes substantial changes in the proposed action that are relevant to environmental concerns; or there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.”³⁵⁹

One decision dealt with the adequacy of the EIS prepared by USFS for coal lease approvals on remand from *High Country Conservation Advocates*.³⁶⁰ The USFS had conducted a fairly detailed market impact analysis in which it estimated the net emissions increase from additional coal leasing as compared with a no action alternative.³⁶¹ Plaintiffs argued that the analysis was flawed because USFS failed to account for potential increases in electricity demand (and usage) in its energy market model (the model assumed fixed electricity demand regardless of how electricity prices changed).³⁶² The USFS had acknowledged in the EIS that an increase in total electricity production may occur as a result of lower fuel and electricity prices but explained that it believed this effect was too speculative to model because there were numerous factors other than fuel prices which affected electricity consumption (and USFS discussed these factors qualitatively).³⁶³ The court found that USFS had adequately examined the issue of electricity demand and explained the basis for excluding this from its quantitative projections of energy consumption and corresponding emissions.³⁶⁴

Plaintiffs also alleged that USFS should have updated its analysis to account for new developments such as the repeal of the Clean Power Plan.³⁶⁵ The court found that USFS did not need to supplement its analysis to reflect new developments such as the repeal of the Clean Power Plan.³⁶⁶ With regards to the second point, the court noted that the agencies preparing the EIS had “disclosed and discussed numerous technological, regulatory, and other factors . . . that influence whether other fuels can be substituted for a particular type of coal” and that in light of the overall depth and scope of the analysis, the failure to supplement this

³⁵⁹ 40 C.F.R. § 1502.9(c)(1)(i)–(ii).

³⁶⁰ *High Country Conservation Advocates v. U.S. Forest Serv.*, 333 F. Supp. 3d 1107, 1131 (D. Colo. 2018).

³⁶¹ *Id.* at 1121.

³⁶² *Id.* at 1129–30.

³⁶³ *Id.*

³⁶⁴ *Id.* at 1130–31.

³⁶⁵ *Id.* at 1131–32.

³⁶⁶ *High Country Conservation Advocates*, 333 F. Supp. 3d at 1132.

analysis with new data was not a significant enough deficiency to warrant judicial intervention.³⁶⁷

The second case on technical assumptions and the duty to supplement involved the 2014 EIS for the Keystone XL Pipeline. In *Indigenous Environmental Network v. U.S. Department of State*, the Montana district court ordered the Department of State to supplement its analysis to reflect significant new information that had arisen since 2014 about oil markets, rail transportation, and GHG emissions.³⁶⁸ The original market analysis, which found that the pipeline would have no impact on fossil fuel use and emissions, illustrates just how difficult it is to accurately assess energy market impacts of individual projects and how easy it is for agencies to predicate these assessments on incorrect assumptions and projections.³⁶⁹ The Department of State had conditioned much of its analysis on the assumption that the price of oil would remain high—specifically, that the price would range from \$100 per barrel to \$140 per barrel over 20 years.³⁷⁰ Shortly after the publication of the 2014 EIS, oil prices fell to nearly \$38 per barrel, and EIA predicts the price of oil will remain below \$100 for decades.³⁷¹ The Department itself conceded during litigation that the current price of oil is approximately \$60 per barrel, well below the \$100 threshold.³⁷² In presenting these facts, the court noted that the Environmental Protection Agency (“EPA”) had even called upon the Department to revisit its conclusions about oil supply in its comments on the 2014 EIS.³⁷³ The court concluded that this new information was significant enough and highly material to the Department’s consideration of how Keystone would affect tar sands production (and consumption) and thus ordered supplementation of the 2014 EIS.³⁷⁴

³⁶⁷ The court also noted that the failure to supplement was not an actionable problem because “plaintiffs do not argue that the expected climate impacts of the lease modifications are anything other than an amount proportionate to the percentage of coal [subject to the lease]” and thus the information in the EIS was “informative of the climate impacts expected to occur under the lease modifications”—in effect, the court accepted the “literalist” approach to calculating indirect emissions here, and relied on this approach in holding that an updated energy market analysis was not required. *Id.*

³⁶⁸ *Indigenous Env'tl. Network v. U.S. Dep't of State*, 347 F. Supp. 3d 561, 575–79 (D. Mont. 2018).

³⁶⁹ *See id.* (discussing problems with energy market assumptions).

³⁷⁰ *Id.* at 576–77.

³⁷¹ *Id.* at 577.

³⁷² *Id.*

³⁷³ *Id.*

³⁷⁴ The district court enjoined further activity on Keystone pending supplementation of the EIS due to this and other deficiencies. But the Trump administration was able to circumvent this decision by (i) issuing Executive Order 13,867, which revised the permitting

At the time of this writing, there were also two pending cases where plaintiffs are alleging that EISs need supplementation due to technical problems with the energy market analysis, both of which deal with BOEM's NEPA analysis for offshore oil and gas leasing. The first, *Gulf Restoration v. Zinke*, involves a challenge to two oil and gas lease sales in the Gulf.³⁷⁵ The BOEM prepared a PEIS for the Gulf leasing program and a subsequent EIS for the lease sales in which it projected the potential impacts of oil and gas leasing (incorporating certain assumptions about energy markets from the PEIS) on energy demand and consumption but also concluded that the exact same impacts would occur if it did not issue the two leases because the same activities would inevitably occur in the same manner and magnitude under an unspecified future lease sale.³⁷⁶ Plaintiffs argue that the energy market projections rely on faulty assumptions—in particular, BOEM used an incorrect royalty rate (assuming royalties would be 18.75 percent instead of the new 12.5 percent rate) and also failed to account for the planned repeal of the Clean Power Plan—and as a result, its projections of oil and gas demand were arbitrarily low.³⁷⁷ Second, plaintiffs argue that it was irrational for BOEM to assume that the same environmental effects would occur even if it did not hold the lease sales, and that it provided no support for its conclusion that an unspecified lease sale would be held in the future and would sell the same projected number of lease blocks as the proposed lease sale, or that the same manner and degree of impact-producing factors would result.³⁷⁸ Plaintiffs note that the assumptions of identical future impacts were particularly unreasonable because the lease sales at issue in this case were of an “expansive scope” and BOEM's practice for the past four decades had been to offer smaller, discrete portions during lease sales.³⁷⁹

process for transboundary projects and clarified that “[a]ny decision to issue, deny, or amend a permit under this section shall be made solely by the President” (this provision was aimed at avoiding a situation where the issuance of such permits was “final agency action” subject to NEPA review); and (ii) revoking the previous permit issued by the State Department for Keystone XL and replacing it with a permit issued directly by the President. Exec. Order No. 13,867, 84 Fed. Reg. 15,491 (Apr. 10, 2019). The Ninth Circuit Court of Appeals subsequently held that the litigation over the NEPA review of Keystone XL was moot due to the revocation of the State Department permit. *Indigenous Env'tl. Network v. U.S. Dep't of State*, No. 18-36068, 2019 WL 2542756 (9th Cir. June 6, 2019).

³⁷⁵ Complaint at 2, *Gulf Restoration v. Zinke*, No. 1:18-cv-01674 (D.D.C. July 16, 2018).

³⁷⁶ *Id.* at 32.

³⁷⁷ *Id.* at 30.

³⁷⁸ *Id.* at 3.

³⁷⁹ *Id.* at 32.

The second case, *Healthy Gulf v. Bernhardt*, involves a nearly identical challenge to another lease sale in the Gulf.³⁸⁰

As noted above, a third question is whether an agency has sufficiently tailored its energy market analysis to the project under review. This issue arose in *Sierra Club v. U.S. Department of Energy*, the case involving DOE's review of LNG exports.³⁸¹ The reports that DOE used in its analysis of life-cycle emissions from LNG exports did not consider the specific effects of the export authorization under review—rather, the analysis was generalized and applicable to all LNG exports (e.g., life-cycle greenhouse gas emissions from LNG exports were estimated per MWh of end-use generation, but there was no estimate of life-cycle emissions for the volume of the exports under review).³⁸²

One of the plaintiff's primary challenges to DOE's review was that it did not tailor the indirect and cumulative impacts analysis, including the greenhouse gas emission estimates, to the specific volume of exports that would be authorized under the proposal (which the Sierra Club argued should be evaluated as indirect effects of the proposal) or total amount of exports from that terminal as well as other pending and anticipated LNG export facilities (which the Sierra Club argued should be evaluated as cumulative effects).³⁸³ The court agreed that DOE's "generalized impact assessment is not tailored to any specific level of exports," but nonetheless upheld the analysis.³⁸⁴ It did not articulate a reason why DOE should not be required to estimate the greenhouse gas emissions for the specific exports under review.

The lawsuits filed to date illustrate some of the potential problems with agency energy market analyses and the need for careful scrutiny by courts to ensure that agencies are not relying on faulty assumptions, ignoring important developments, or manipulating the analysis to make the project's impacts appear less substantial. In many respects, the use of energy market models is an important and positive development—and certainly a better approach than relying on unsupported claims of perfect substitution. But focusing on the project's "net emissions" is not the only approach for evaluating upstream and downstream emissions. It would also be reasonable to treat gross downstream and upstream emissions as indirect effects of the proposal. Indeed, this is how most impacts are

³⁸⁰ Complaint at 2, *Healthy Gulf v. Bernhardt*, No. 1:19-cv-00707 (D.D.C. Mar. 13, 2019).

³⁸¹ *Sierra Club v. U.S. Dep't of Energy*, 867 F.3d 189, 192 (D.C. Cir. 2017).

³⁸² *Id.*

³⁸³ *Id.* at 197.

³⁸⁴ *Id.* (emphasis omitted).

evaluated under NEPA—agencies focus on the actual impacts of the proposal under review without attempting to project the possible impacts of other activities that may occur if the proposal is not implemented. For example, in NEPA reviews for proposals that involve timber harvests, agencies focus on the impacts of the harvest under review and do not project the extent to which timber would be sourced from elsewhere if the proposal were not approved and then use such projections to derive estimates of “net impacts.”³⁸⁵ Moreover, in NEPA reviews for fossil fuel supply projects, more local environmental impacts (e.g., air and water quality impacts) are also evaluated on gross terms.³⁸⁶

The Stockholm Environment Institute (“SEI”) describes this approach of focusing on gross emissions as a “literalist” approach to emissions inventorying due to its specific focus on logic: because of a given project, a certain amount of fuel will be produced, transported, processed, and consumed, and this will generate a certain quantity of greenhouse gas emissions.³⁸⁷ The “literalist” approach accounts for the greenhouse gas impact of the fuel handled by the project without considering how the project affects broader energy markets.³⁸⁸ As such, it may be viewed as only a partial analysis of impacts. However, the net emissions analysis, which SEI characterizes as the “economist” approach, requires decision makers to “make assumptions about long-term economic responses that are difficult to assess”³⁸⁹ and thus it is inherently speculative.

One rationale for treating GHG emissions differently than other impacts is that the effect of the emissions is the same regardless of where they are generated and thus it is possible to assess net emission impacts without more precise data about geographic location. But agencies, courts, and the public should question whether this is a strong enough rationale for making decisions based on highly uncertain findings about energy market impacts (or vague statements about possible substitution) as opposed to a straightforward inventory of gross emissions. The “net

³⁸⁵ See, e.g., U.S. FOREST SERV., USDA, ENVIRONMENTAL IMPACT STATEMENT, NATIONAL FOREST SYSTEM LAND MANAGEMENT PLANNING vi (2008), https://www.fs.fed.us/emc/nfma/includes/planning_rule/eis.pdf [<https://perma.cc/BE9Z-GEQK>]; *Proposed RMP/Final EIS*, U.S. BUREAU LAND MGMT., DEPT' INTERIOR, https://www.blm.gov/or/plans/rmpswestern_oregon/feis/ [<https://perma.cc/9AFP-YAYC>] (last visited Dec. 3, 2019).

³⁸⁶ See JAYNI HEIN ET AL., INST. FOR POL'Y INTEGRITY, PIPELINE APPROVALS AND GREENHOUSE GAS EMISSIONS 31 (2019).

³⁸⁷ PETER ERICKSON & MICHAEL LAZARUS, STOCKHOLM ENV'T INST., ASSESSING THE GREENHOUSE GAS EMISSIONS IMPACT OF NEW FOSSIL FUEL INFRASTRUCTURE 2–3 (2013).

³⁸⁸ *Id.* at 2–3, 6.

³⁸⁹ *Id.* at 6.

emissions” analysis may prove too speculative to truly help with decision-making. Granted, energy market models also have the potential to provide highly useful information to inform decision-making about fossil fuel supply proposals so long as the inputs, assumptions, and parameters are sound—particularly in the context of programmatic-level reviews. The critical question going forward is whether agencies are capable of setting reasonable parameters and making reasonable projections, particularly when conducting project-level reviews (as it becomes more difficult to model impacts at a smaller scale). It may be the case that the energy market modelling approach makes the most sense for programmatic reviews and that simply calculating the gross upstream and downstream emissions is sufficient for project-level reviews. Granted, some individual supply projects involve the production or transportation of very large quantities of fossil fuels, and the modelling approach may be warranted for those reviews as well.

As discussed above, there are ways in which agencies using energy market models can improve the accuracy and integrity of their analysis. To summarize, agencies should (i) consider all possible energy substitutes, including renewable energy at minimum (and ideally including nuclear energy and demand-side energy efficiency as well); (ii) consider multiple energy market scenarios, including scenarios consistent with 1.5 and 2°C futures; (iii) use the best available and up-to-date pricing information and projections; and (iv) be transparent about the assumptions and parameters of their analysis.

B. Significance of GHG Emissions

The identification of significant impacts is an essential step in the NEPA process, critical not only to the decision to prepare an EIS but also for the purposes of informed decision-making and public disclosure and analysis of mitigation measures. Courts have begun to flesh out agency obligations with respect to significance determinations for fossil fuel supply projects. Below, we highlight four key principles from the regulations and case law (some of which overlap with themes we have already discussed): (i) agencies must account for the full scope of direct, indirect, and cumulative emissions when evaluating significance; (ii) agencies must use correct technical assumptions to estimate the magnitude of the emissions impact; (iii) agencies must apply the regulatory criteria for evaluating context and intensity; and (iv) agencies must conduct a balanced assessment of costs and benefits.

Notably, the decisions issued to date and the undecided cases all deal with the reasonableness of assumptions and analyses underlying significance determinations; there are no lawsuits directly challenging findings of insignificance on the grounds that the total magnitude of the emissions impact is too large to be viewed as insignificant. Such a challenge may prove difficult, as significance is a highly subjective concept and courts are deferential to agency conclusions on such matters.³⁹⁰ That being said, while it is true that significance is subjective and it is difficult to draw a clear line between the level of GHG emissions that is and is not significant, there are also instances where the direct and indirect GHGs from a proposal clearly pass any reasonable threshold of significance, and in such contexts, courts should intervene.³⁹¹

1. Agencies Must Take a “Hard Look” at the Full Scope of GHG Emissions

Section 1502.16 of the CEQ regulations requires agencies to discuss the significance of both direct and indirect effects, and section 1508.27, which outlines the criteria for assessing significance, makes it clear that cumulative impacts are also relevant to the significance determination.³⁹² Part II clarifies the potential scope of GHG emissions that must be accounted for in NEPA reviews for fossil fuel supply projects (and quantified where possible). These include direct, indirect, and cumulative emissions, as well as emissions from related actions, which may include connected, cumulative, and/or similar actions. There are a number of cases in which courts have remanded significance determinations—typically FONSI—on the grounds that the agencies failed to quantify indirect or cumulative emissions.³⁹³

³⁹⁰ “A court’s role in reviewing an agency’s decision not to prepare an EIS is a limited one, designed primarily to ensure that no arguably significant consequences have been ignored.” *Mayo v. Reynolds*, 875 F.3d 11, 15, 19–21 (D.C. Cir. 2017) (internal quotations omitted).

³⁹¹ *See, e.g.*, MONT. DEP’T OF ENVTL. QUALITY, OFF. OF SURFACE MINING, WESTERN ENERGY AREA F: FINAL ENVIRONMENTAL IMPACT STATEMENT 473–91 (2018) (the agency estimated that coal mining proposal would generate 235,355,989 tons of CO₂e over the lifetime of the project but did not reach a conclusion as to whether this was a significant impact).

³⁹² 40 C.F.R. § 1508.27.

³⁹³ *See, e.g.*, *Sierra Club v. FERC*, 867 F.3d 1357, 1375 (D.C. Cir. 2017) (remanding to FERC to evaluate significance of indirect emissions); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 83, 85 (D.D.C. 2019) (finding inadequate support for EA/FONSI); *WildEarth Guardians v. Zinke*, No. 1:17-cv-0080, 2019 WL 2404860, at *12 (D. Mont. Feb. 11, 2019); *San Juan Citizens All. v. U.S. Bureau of Land Mgmt.*, 326 F. Supp. 3d 1227, 1249 (D.N.M. 2018) (finding inadequate support for EA/FONSI); *Mont. Env’tl. Info. Ctr. v. U.S. Off. of Surface Mining*, No. CV 15-106-M-DWM, 2017 WL 5047901 at *6 (D. Mont. Nov. 3, 2017).

For example, in *San Juan Citizens Alliance v. Bureau of Land Management*, the New Mexico district court found that BLM's FONSI for oil and gas leasing was fatally flawed because BLM had failed to account for both indirect and cumulative emissions.³⁹⁴ The court specifically emphasized BLM's duty to analyze significance in the context of cumulative effects, pursuant to 40 C.F.R. section 1508.7:

It is the broader, significant "cumulative impact" which must be considered by an agency, but which was not considered in this case. Without further explanation, the facile conclusion that this particular impact is minor and therefore "would not produce climate change impacts that differ from the No Action Alternative," is insufficient to comply with Section 1508.7.³⁹⁵

In at least three other cases involving fossil fuel production, reviewing courts have remanded EAs and FONSI's because the agency did not quantify indirect emissions (and in some cases also cumulative emissions) and therefore failed to take a hard look at the severity of the emissions.³⁹⁶

The D.C. Circuit Court of Appeals also addressed FERC's obligations to discuss the significance of indirect and cumulative emissions in *Sierra Club v. FERC*, which involved FERC's failure to account for downstream emissions from a natural gas pipeline project.³⁹⁷ There, the court held that FERC must amend its EIS to include not only a quantified inventory of indirect emissions but also "a discussion of the 'significance' of this indirect effect . . . as well as 'the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.'"³⁹⁸ The court noted that quantification would be essential to the evaluation of significance but did not otherwise specify what the significance analysis should include.³⁹⁹

³⁹⁴ *San Juan Citizens All.*, 326 F. Supp. 3d at 1244.

³⁹⁵ *Id.* at 1248.

³⁹⁶ *WildEarth Guardians*, 368 F. Supp. 3d at 59, 85; *WildEarth Guardians*, 2019 WL 2404860, at *7; *Mont. Env'tl. Info. Ctr.*, 2017 WL 5047901, at *6.

³⁹⁷ *Sierra Club v. FERC*, 867 F.3d at 1374.

³⁹⁸ *Id.*

³⁹⁹ *Id.* The court also noted that Sierra Club had "asked FERC to convert emissions estimates to concrete harms by way of the Social Cost of Carbon" in its rehearing request, but did not issue a ruling on whether such disclosure was required (as neither party explicitly raised this in their briefs). *Id.* at 1375. Rather, the court directed FERC to explain its position on using the Social Cost of Carbon in the amended EIS. *Id.*

The analysis prepared by FERC on remand from this case is illustrative of how agencies can avoid significance determinations and why further judicial intervention may be needed to ensure meaningful analysis of the significance of indirect and cumulative emissions under NEPA. FERC estimated that the combustion of natural gas from the pipeline would generate 8.36 million tons per year of CO₂ emissions, which is roughly equal to the emissions from (i) approximately 1.8 million passenger vehicles driven each year or (ii) approximately 1.25 million homes' electricity use for one year.⁴⁰⁰ Nonetheless, FERC quickly dismissed the significance of the emissions on the grounds that it lacked a threshold for assigning significance to GHG emissions, and it further noted that the indirect GHG calculations did not alter its assessment of the project because:

[T]he No Action Alternative would not result in predictable actions if the SMP Project were not built. For example, the project's shippers may seek to transport the same volumes of natural gas by expanding existing transportation systems or constructing new facilities. Because the No Action Alternative could result in lesser, equal, or greater GHG emissions than the SMP Project, we cannot use the quantified downstream GHG emissions from the SMP Project to meaningfully compare the two.⁴⁰¹

FERC also declined to estimate the social cost of the emissions.⁴⁰² The supplemental analysis and significance determination (or lack thereof) has not been challenged in court, but we note that this analysis is very similar to arguments about possible perfect substitution that have been rejected in the context of production proposals.

⁴⁰⁰ *Greenhouse Gas Equivalencies Calculator*, EPA, <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator> [<https://perma.cc/VX3S-N72Z>] (last updated Oct. 15, 2018).

⁴⁰¹ FERC, SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT 9 (2018), <https://www.ferc.gov/industries/gas/enviro/eis/2018/02-05-18-FEIS/02-05-18-FEIS.pdf> [<https://perma.cc/76G4-HHG4>].

⁴⁰² According to estimates set forth in our comments on the DSEIS, the social costs would be roughly \$306 million during the first year of operation and would rise to approximately \$492 million per year by 2040. COLUM. SABIN CTR. FOR CLIMATE CHANGE L., COMMENT LETTER ON DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (Nov. 17, 2017), http://columbiaclimatelaw.com/files/2016/05/Sabin_Center_Comments_Southeast_DSEIS.pdf [<https://perma.cc/4YCS-46A4>].

2. Agencies Must Use Sound Technical Assumptions When Measuring the Severity of the Emissions Impact

If the technical assumptions underlying an agency's emission estimates are unreasonable, this would render any significance determination predicated on that analysis arbitrary and capricious. Above, we discuss the legal adequacy of assumptions pertaining to energy substitution and net emissions, as that has been the focus of many lawsuits in recent years. But there are other types of technical assumptions that are also critical to accurate emissions quantification. Here, we focus on two examples which have been the subject of litigation: assumptions about the global warming potential ("GWP") of non-CO₂ emissions (which are relevant when converting those emissions to CO₂ equivalent ("CO₂e")),⁴⁰³ and assumptions about the amount of methane emissions generated from natural gas wells and pipeline infrastructure.

Agencies frequently rely on estimates of CO₂e to aggregate all types of GHGs, and using the right GWP is necessary in order to accurately estimate CO₂e for non-CO₂ emissions. Three lawsuits have been filed against BLM for using an arbitrarily low GWP value to estimate the effects of methane in terms of CO₂e. Specifically, plaintiffs have alleged that (i) BLM relied on an outdated 100-year GWP of 21, instead of the IPCC's current 100-year GWP of 36; and (ii) BLM should have calculated methane emissions using the twenty-year GWP of 87, as this more closely corresponded with the anticipated project duration.⁴⁰⁴ The consequence of choosing a lower GWP is dramatic: one complaint alleges that BLM underestimated the global warming effect of methane by a factor of four.⁴⁰⁵ In *Western Organization of Resource Councils v. Bureau of Land Management*, the Montana district court held that BLM's "unexplained decision to use the 100-year time horizon, when other more appropriate time horizon remained available, qualifies as arbitrary and capricious."⁴⁰⁶ There, the

⁴⁰³ The GWP is a measure of how much heat a GHG traps in the atmosphere over a specific amount of time (e.g., 100 years), as compared to CO₂. *Understanding Global Warming Potentials*, EPA, <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials> [<https://perma.cc/9GY3-KWM2>] (last updated Feb. 14, 2017).

⁴⁰⁴ Petition for Review at 24, *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, 342 F. Supp. 3d 1145 (D. Colo. 2018) (No. 1:16-cv-01822); Complaint at 35, *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, No. 1:18-cv-00987 (D. Colo. Apr. 26, 2018); Amended Complaint at 41, *W. Org. of Res. Councils v. U.S. Bureau of Land Mgmt.*, No. 4:16-cv-00021-BMM, 2018 WL 1475470 (D. Mont. Mar. 26, 2018).

⁴⁰⁵ Petition for Review at 24, *Wilderness Workshop*, 342 F. Supp. 3d 1145 (No. 1:16-cv-01822 -WYD).

⁴⁰⁶ *W. Org. of Res. Councils*, 2018 WL 1475470, at *15.

court noted that BLM had used the twenty-year GWP in other NEPA documentation, which demonstrated that BLM was aware of the evolving nature of the science regarding methane emissions estimation, and BLM had failed to provide a satisfactory explanation for using the 100-year GWP.⁴⁰⁷ In contrast, in *Wilderness Workshop v. Bureau of Land Management*, the Colorado district court upheld BLM's use of a 100-year GWP of 21 where the court felt that BLM had adequately explained its basis for doing so.⁴⁰⁸ The third case has not yet been decided.⁴⁰⁹

Agencies should also use the best available data to estimate methane emissions from oil and gas infrastructure. There has not been much litigation about this issue to date, but there is a growing body of research suggesting that the federal government has dramatically underestimated methane emissions from oil and gas infrastructure which may give rise to future lawsuits.⁴¹⁰ There is one case which addresses the adequacy of agency methane calculations. In *Wilderness Workshop*, plaintiffs also alleged that BLM made improper assumptions about the magnitude of methane emissions—specifically, that BLM used modeling data to estimate methane emissions that came solely from survey responses of oil and gas operators without confirming those answers, that the data was not based on current or historic emission rates but on forecast emissions in 2028, and that BLM improperly adjusted the emission rates on a faulty assumption about the implementation of control technologies on oil and gas sources.⁴¹¹ The plaintiffs offered alternative calculations of methane emissions.⁴¹²

⁴⁰⁷ *Id.*

⁴⁰⁸ *Wilderness Workshop*, 342 F. Supp. 3d at 1161.

⁴⁰⁹ *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, No. 1:18-cv-00987 (D. Colo. Apr. 26, 2018).

⁴¹⁰ Ramón Alvarez et al., *Assessment of Methane Emissions from the U.S. Oil and Gas Supply Chain*, 361 SCI. 186, 186 (2018), <https://science.sciencemag.org/content/361/6398/186> [<https://perma.cc/M3QB-34NY>]; Megan Geuss, *Study: US oil and gas methane emissions have been dramatically underestimated*, ARS TECHNICA (June 22, 2018), <https://arstechnica.com/science/2018/06/study-us-oil-and-gasmethane-emissions-have-been-dramatically-underestimated/> [<https://perma.cc/X54J-VPTD>]; Ken Paulman, *Study finds EPA vastly underestimating methane emissions*, ENERGY NEWS NETWORK (June 22, 2018), <https://energynews.us/digests/study-finds-epa-vastly-underestimating-methane-emissions/> [<https://perma.cc/FDT9-2L62>]; Bob Weber, *New study suggests oils and greenhouse gas emissions underestimated*, CANADIAN PRESS (Apr. 23, 2019), <https://www.citynews1130.com/2019/04/23/new-study-suggests-oilsands-greenhouse-gas-emissions-underestimated/> [<https://perma.cc/KBD5-RSL2>]; *Major studies reveal 60% more methane emissions*, ENVTL. DEF. FUND, <https://www.edf.org/climate/methane-studies> [<https://perma.cc/XS3F-3QTA>] (last visited Dec. 3, 2019).

⁴¹¹ *Wilderness Workshop*, 342 F. Supp. 3d at 1160–62.

⁴¹² *Id.* at 1161.

However, the court held that the plaintiffs had not adequately supported their own calculations and that this left the court “with no reliable way to sufficiently judge Plaintiff’s analysis on the issue” and, in addition, that plaintiffs had not persuasively explained how the use of industry data or assumptions underpinning BLM’s analysis resulted in incorrect methane calculations.⁴¹³ It thus held that it must defer to BLM’s calculations of methane emissions.⁴¹⁴

3. Significance Must Be Assessed in Light of Regulatory Criteria

The NEPA regulations direct agencies to consider both context and intensity when assessing significance as well as a number of more specific factors relevant to gauging the intensity of the impact.⁴¹⁵ These include, *inter alia*, “[t]he degree to which the proposed action affects public health or safety”; “[t]he degree to which the effects on the quality of the human environment are likely to be highly controversial”; “[t]he degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks”; “[t]he degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration”; and “[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts.”⁴¹⁶ With regards to cumulative impacts, section 1508.27 notes that “[s]ignificance exists if it is reasonable to anticipate a cumulatively significant impact on the environment” and that “[s]ignificance cannot be avoided by terming an action temporary or by breaking it down into small component parts.”⁴¹⁷

The context for federal approvals of fossil fuel supply projects can be framed as follows: climate change is causing and will cause harm to public health and welfare, on scales ranging from the global to the highly local, and to address this problem the United States must rapidly reduce its dependency on fossil fuels. Where fossil fuel production takes place on private lands, the government’s ability to address climate impacts is limited. But where the federal government has authority over production on public lands and transportation projects that require federal approval, the government has the opportunity to consider the potential GHG emissions and act on this information. With this in mind, agencies should look at

⁴¹³ *Id.* at 1162.

⁴¹⁴ *Id.*

⁴¹⁵ 40 C.F.R. § 1508.27.

⁴¹⁶ *Id.*

⁴¹⁷ *Id.*

the proposal's impact on fossil fuel consumption and emissions in the context of global, national, regional, or state carbon budgets (or emission reduction targets) with an eye towards understanding whether the proposal can be implemented without undermining progress towards decarbonization. Granted, NEPA does not require an agency to avoid all significant impacts—and thus an agency may proceed with a fossil fuel supply proposal even if it is inconsistent with decarbonization or emission reduction goals—but this sort of analysis is needed in order for decision makers to make informed decisions about how to proceed with fossil fuel-related proposals when decarbonization is a critical social goal.

Agencies must also consider “intensity”—that is, the “severity of the impact.”⁴¹⁸ There are several ways that agencies can assess the severity of the emissions impact. One option is to provide a qualitative description of climate change impacts and use the estimated GHG emissions as a proxy for the “severity” of the project's contribution to those impacts. This approach was endorsed in the rescinded CEQ guidance.⁴¹⁹ The one key limitation to this approach is that CO₂e estimates do not, in of themselves, provide a clear picture of the potential magnitude of the impact on humans and ecosystems—and when the estimates are compared to global, national, or state emission totals, they inevitably appear relatively small.

Other tools are available to better understand the magnitude of the emissions impact. These include (i) the Social Cost of Carbon (SC-CO₂), Methane (SC-CH₄), and Nitrous Oxide (SC-N₂O) metrics that were developed through a federal interagency consultation process and approved by the courts, which can be used to assign a dollar value to the potential impacts of these emissions;⁴²⁰ (ii) the EPA's quantification threshold

⁴¹⁸ 40 C.F.R. § 1508.27(b).

⁴¹⁹ CEQ, Final Guidance Memo, *supra* note 49, at 4. Such a qualitative description of climate change impacts can also help to satisfy the requirement to look at “cumulative impacts” of the proposal combined with other foreseeable actions.

⁴²⁰ The Social Cost of Carbon, Methane, and Nitrous Oxide, despite being officially “rescinded” by President Trump, are scientifically credible estimates of the societal costs of greenhouse gas emissions, developed through a lengthy process of interagency consultation and peer review, and that cost is absolutely relevant to assessing the nature and significance of the proposed program's environmental consequences. *See Zero Zone Inc. v. U.S. Dep't of Energy*, 832 F.3d 654 (7th Cir. 2016) (upholding use of methodology for calculating social cost of carbon used by the Interagency Working Group on the Social Cost of Carbon); INTERAGENCY WORKING GRP. ON THE SOCIAL COST OF GREENHOUSE GASES, TECHNICAL SUPPORT DOCUMENT: TECHNICAL UPDATE OF THE SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866 (May 2013, revised Aug. 2016); INTERAGENCY WORKING GRP. ON THE SOCIAL COST OF GREENHOUSE GASES, ADDENDUM TO TECHNICAL SUPPORT DOCUMENT ON SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866: APPLICATION OF THE METHODOLOGY TO ESTIMATE THE

of 25,000 tons per year of CO₂e to identify major emitters for the purposes of GHG reporting (as noted by EPA, facilities that surpass this threshold are considered the “largest emitters” in the country);⁴²¹ (iii) the EPA’s GHG Equivalencies Calculator, which can be used to compare emissions from the proposal with, for example, emissions from household electricity use or vehicle miles driven;⁴²² and (iv) evaluating the proposal and its emissions in the context of global, national, and (where applicable) state carbon budgets. As climate change attribution science progresses, it may also become possible to link the emissions from a particular proposal to specific impacts (e.g., a certain amount of sea level rise) based on the proportional contribution to global emissions.⁴²³ Such an assessment may already be feasible in the context of a very large action, such as a programmatic review of federal coal leasing, as scientists are already linking very large emission sources to specific impacts, but would prove challenging for more discrete proposals with smaller emissions impacts.⁴²⁴

The intensity criteria set forth in section 1508.27 should also be used in this analysis. Many of these factors weigh in favor of a significance finding for GHG emissions from fossil fuel supply projects. For example, one could argue that the effect of these projects—particularly the effects on fossil fuel consumption and GHG emissions—are “highly controversial” because there are substantial disputes about the accuracy of agency assessments and the actual magnitude of the emissions impacts from these proposals. It could also be argued that these effects are “highly uncertain” and “involve unique or unknown risks” due to the level of uncertainty discussed in NEPA documentation as well as broader uncertainty about the potential magnitude and impact of climate change. The approval of fossil fuel extraction and transportation projects (and corresponding NEPA analysis) can also “establish a precedent for future actions with significant effects” and “represents a decision in principle about a future

SOCIAL COST OF METHANE AND THE SOCIAL COST OF NITROUS OXIDE 2–3 (Aug. 2016). *See also* Mont. Env’tl. Info. Ctr. v. U.S. Off. of Surface Mining, 274 F. Supp. 3d 1074, 1094–95 (D. Mont. 2017) (requiring disclosure of GHG costs in NEPA review where benefits were also disclosed, and citing the federal Social Cost of Carbon as an available disclosure tool); High Country Conservation Advocates v. U.S. Forest Serv., 52 F. Supp. 3d 1174, 1178, 1187 (D. Colo. 2014) (also requiring disclosure of GHG costs in NEPA reviews where benefits were disclosed).

⁴²¹ *Greenhouse Gas Reporting Program (GHGRP)*, EPA, <https://www.epa.gov/ghgreporting/key-facts-and-figures> [<https://perma.cc/ESK5-KP33>] (last updated Oct. 1, 2019).

⁴²² *Greenhouse Gas Equivalencies Calculator*, *supra* note 400.

⁴²³ *See* Michael Burger, Radley Horton & Jessica Wentz, *The Law and Science of Climate Change Attribution*, 45 COLUM. J. ENVTL. L. (forthcoming Jan. 2020) (manuscript at 53–62).

⁴²⁴ *Id.* at 53.

consideration”—specifically, whether the United States should adopt supply-side constraints on fossil fuels to address climate change and whether the infrastructure will result in fossil fuel “lock in.” And finally, there can be no doubt that each of these approvals is “related to other actions with individually insignificant but cumulatively significant impacts”—that is, the approval of other fossil fuel leases, RMPs, and transportation infrastructure—all of which contributes to the ongoing supply of and reliance on fossil fuels. As noted in section 1508.27, this last factor is dispositive: “Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment.”

As discussed in Part I, agencies often fail to assess the significance of GHG emissions in light of the regulatory factors, and this has resulted in a number of lawsuits.⁴²⁵ One decision from the D.C. Circuit district court contained a particularly detailed assessment of the regulatory requirements.⁴²⁶ The critical question was whether BLM had adequately justified FONSI that it issued for five oil and gas lease sales covering a total of 282 leases on 303,000 acres of federal lands in Wyoming.⁴²⁷ The court explained that the key considerations are whether the agency:

(1) has accurately identified the relevant environmental concern, (2) has taken a hard look at the problem in preparing its [FONSI or Environmental Assessment], (3) is able to make a convincing case for its finding of no significant impact, and (4) has shown that even if there is an impact of true significance, an EIS is unnecessary because changes or safeguards in the project sufficiently reduce the impact to a minimum.⁴²⁸

⁴²⁵ *Sierra Club v. FERC*, 867 F.3d 1357, 1375 (D.C. Cir. 2017) (remanding to FERC to evaluate significance of indirect emissions); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 76 (D.D.C. 2019) (finding inadequate support for EA/FONSI); *San Juan Citizens All. v. U.S. Bureau of Land Mgmt.*, 326 F. Supp. 3d 1227, 1247 (D.N.M. 2018) (finding inadequate support for EA/FONSI). *See also* *Atchafalaya Basinkeeper v. U.S. Army Corps of Eng'rs*, 894 F.3d 692, 697–98 (5th Cir. 2018) (alleging that USACE “failed to assess the climate impacts of ‘locking in’ future reliance on fossil fuels with a massive infrastructure investment”); Complaint at 27, *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, No. 4:18-cv-00073 (D. Mont. May 15, 2018) (alleging that agency failed to disclose social costs, and failed to evaluate context and intensity); Complaint at 2, 36, *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, No. 1:18-cv-00987 (D. Colo. Apr. 26, 2018) (alleging that the agency failed to prepare EA or EIS for proposal and thus failed to evaluate significance of emissions in light of regulatory criteria).

⁴²⁶ *WildEarth Guardians*, 368 F. Supp. 3d at 63–64, 66–67, 69–71.

⁴²⁷ *Id.* at 55.

⁴²⁸ *Id.* at 80.

Applying these factors, the court held that BLM could not support its FONSI because it had failed to take a hard look at all indirect and cumulative emissions.⁴²⁹ However, the court also looked at two other significance factors—whether the action is highly controversial and whether it involves highly uncertain or unique or unknown risks—and found that these factors, standing alone, would not compel preparation of an EIS.⁴³⁰

With regards to controversy, the court said it could not conclude that the effects of leasing are highly controversial because controversy in the NEPA context “is not measured merely by the intensity of opposition” but whether there is “a substantial dispute . . . as to the size, nature, or effect of the major federal action” or “scientific or other evidence that reveals flaws in the methods or data relied upon by the agency in reaching its conclusions.”⁴³¹ If there is opposition from other agencies with “special expertise” or stakes in the decision, this would also support a finding of controversy.⁴³² Regarding the EA at issue, the court noted that, although plaintiffs had shown that BLM’s impact assessment was inadequate, they had not yet showed that there was a significant dispute as to the magnitude of the impact or the methods and data used in the analysis.⁴³³ However, the court recognized that BLM’s analysis on remand would “more fully illustrate” its position on the magnitude of the emissions impact.⁴³⁴ Thus, having a more complete assessment which includes BLM’s assessment of the significance of indirect and cumulative emissions may make it easier for plaintiffs to demonstrate controversy, particularly if BLM relies on questionable assumptions about market impacts to discount the significance of the emissions impacts.

With regards to whether the effects were highly uncertain, the court explained that this factor is implicated when an action involves new science or when an action’s impact is unknown.⁴³⁵ However, the court held that uncertainty about the magnitude of the emissions impact in this case was not enough to trigger the type of “uncertainty” contemplated by the regulations because all parties agree that GHGs contribute to climate

⁴²⁹ The court emphasized that the potential for cumulative effects was a key consideration in the significance analysis and found that BLM had failed to adequately assess those cumulative effects, pursuant to the criteria set forth in the CEQ regulations. *Id.* at 77.

⁴³⁰ *Id.* at 80.

⁴³¹ *Id.* at 81 (internal citations omitted).

⁴³² *WildEarth Guardians*, 368 F. Supp. 3d at 82.

⁴³³ *Id.* at 63, 74.

⁴³⁴ *Id.* at 82.

⁴³⁵ *Id.*

change and the impacts of climate change are known as a general manner.⁴³⁶ Thus, the court held that this factor is only triggered where there is uncertainty about the *nature* of the impacts, not the severity.

Some litigants have also challenged agency significance assessments for failure to use some of the tools described above for better understanding the severity and context of emissions impacts. For example, some litigants have argued that agencies should disclose the social cost of emissions as this is an easier metric for decision makers and the public to understand than tonnage of CO₂e.⁴³⁷ But under the Trump administration, agencies have consistently refused to disclose the social cost of GHG emissions.⁴³⁸ The primary rationales for not disclosing social costs are (i) the metrics were developed for a rule-making context; (ii) NEPA does not require a cost-benefit analysis or monetization of costs; (iii) the metrics do not accurately reflect the incremental emissions impact of the proposal (because there is significant uncertainty about the actual cost of emissions and the social cost metrics do not capture all costs); and (iv) the metrics are not useful to decision makers because they are presented as a range of possible values and there is no criteria or thresholds against which to gauge the significance of those values.⁴³⁹

As discussed below, courts have only required use of the social cost metrics where agencies have also disclosed economic benefits,⁴⁴⁰ but outside of that context, courts have deferred to agency rationales for not disclosing social costs without evaluating the merits of these arguments.⁴⁴¹ This is unfortunate, as there is good reason to be critical of these rationales.

⁴³⁶ *Id.* at 79.

⁴³⁷ Although these metrics do not provide a way of disaggregating emissions impacts into specific identifiable impacts, they do provide a useful tool for conceptualizing the overall costs to society of the emissions associated with a proposal. FRANK ACKERMAN & ELIZABETH A. STANTON, CLIMATE CHANGE & GLOBAL EQUITY, CLIMATE RISKS & CARBON PRICES: REVISING THE SOCIAL COST OF CARBON 151–86 (2014).

⁴³⁸ See Jessica Wentz, *New Draft Guidance on Climate Change and NEPA Reviews Unlikely to Significantly Affect Agency Practice or Judicial Interpretation of NEPA Obligations*, SABIN CTR. FOR CLIMATE CHANGE LAW, COLUM. L. SCH. (June 24, 2019), <http://blogs.law.columbia.edu/climatechange/2019/06/24/new-draft-guidance-on-climate-change-and-nepa-reviews-unlikely-to-significantly-affect-agency-practice-or-judicial-interpretation-of-nepa-obligations/> [https://perma.cc/35HP-JTLY].

⁴³⁹ See, e.g., U.S. BUREAU OF LAND MGMT., DEPT OF THE INTERIOR, COASTAL PLAIN OIL AND GAS LEASING PROGRAM DRAFT ENVIRONMENTAL IMPACT STATEMENT VOLUME II: APPENDICES F-2–F-4 (Dec. 2018).

⁴⁴⁰ See *infra* Section III.B.4.

⁴⁴¹ See, e.g., *EarthReports, Inc. v. FERC*, 828 F.3d 949, 956 (D.C. Cir. 2016); *Appalachian Voices v. FERC*, No. 17-1271, 2019 WL 847199, at *2 (D.D.C. Feb. 19, 2019).

With regards to the first argument, the metrics may have been developed for a rule-making context, but they can readily be used in an environmental analysis to better understand the potential costs associated with greenhouse gas emissions—and those cost estimates are a useful proxy for the actual impacts of climate change. The fact that the metrics were developed for rule-making is irrelevant to the question of whether they would be useful in NEPA analyses.

With regards to the second argument, while it is true that NEPA does not require cost-benefit analysis, the disclosure of social costs is nonetheless useful to decision makers and the public and a relatively easy exercise (as it simply entails multiplying emissions by social cost metrics). Agencies also frequently monetize benefits and should monetize costs for a fair and balanced assessment, even where the EIS does not contain a complete cost-benefit analysis.

With regards to the third argument (that the social cost metrics do not measure the actual incremental impacts of a project on the environment and do not include all damages or benefits from carbon emissions), this statement is partially incorrect. The SC-CO₂, SC-CH₄, and SC-N₂O measure the actual incremental impacts of a project on the physical and human environment by specifying the incremental costs associated with an incremental increase in GHG emissions. These impacts are expressed as monetary costs rather than specific physical impacts because this is a reasonable and comprehensible way to aggregate many different impacts in a single metric. While it is true that the metrics do not capture all costs associated with GHG emissions, they at least capture a portion of those costs (and the agency can disclose the costs that are not covered).

With regards to the fourth argument (that the metrics are unhelpful because estimates are presented as a range of possible values and there is no threshold for significance), the fact that the estimates are presented as a range of values is actually beneficial, as it addresses uncertainty, and such ranges can be used to define the bounds of possible foreseeable outcomes. This sort of forecasting is common under NEPA. And although it is true that there is no significance threshold defined for GHGs or social costs, this is true for many different types of impacts that are evaluated in NEPA reviews—there are no bright line rules for assessing significance, and agencies typically must use their discretion to determine when impacts pass the threshold of significance. The monetization of climate change impacts, however, is useful in informing significance determinations insofar as it provides a standard metric for comparing different impacts.

The other main disclosure tool that agencies can and should use to evaluate the significance of emissions impacts is a carbon budget.

Estimates have been developed for both the global and national carbon budget, and some states have developed their own carbon budgets as well.⁴⁴² At least three of the lawsuits brought to date have also involved allegations that agencies should have examined emissions in light of a carbon budget.⁴⁴³ The case law on this matter is less well-developed than the case law on social cost metrics. In one decision on this issue, *Western Organization of Resource Councils v. Bureau of Land Management*, the Montana district court held that BLM was not required to use a “global carbon budget” as the standard by which to measure emissions impacts because “Plaintiffs identify no case, and the Court has discovered none, that supports the assertion that NEPA requires the agency to use a global carbon budget analysis.”⁴⁴⁴ The D.C. district court in *WildEarth Guardians v. Zinke* also deferred to BLM’s decision not to use the global carbon budget to evaluate the severity of the emissions, again citing the lack of any precedent requiring such an analysis in the NEPA context.⁴⁴⁵ The third case has not yet been decided.⁴⁴⁶

It is unsurprising that courts are reluctant to require the use of a particular analytic tool, but this is one context in which judicial intervention may make sense. Courts in other countries have begun to enforce national emission reduction obligations based on carbon budgets,⁴⁴⁷ and this is arguably the best way to understand the context and intensity (and thus significance) of both project- and program-level impacts. There is also a provision in the NEPA regulations which requires agencies to “discuss any inconsistency of a proposed action with any approved State or local plan and laws” which could be interpreted as requiring a disclosure of consistency with state and local carbon budgets or GHG reduction targets, particularly in states that have adopted policies to this effect.⁴⁴⁸

⁴⁴² See, e.g., Daniel J. Hayes & Rodrigo Vargas, *The North American Carbon Budget*, in *SECOND STATE OF THE CARBON CYCLE REPORT: A SUSTAINED ASSESSMENT REPORT* 71 (Cavallaro et al. eds., 2018); Corinne Le Quéré et al., *Global Carbon Budget 2018*, 10 *EARTH SYS. SCI. DATA* 2141 (2018).

⁴⁴³ See *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41 (D.D.C. 2019); *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, No. 1:18-cv-00987 (D. Colo. Apr. 26, 2018); *W. Org. of Res. Councils v. U.S. Bureau of Land Mgmt.*, No. 4:16-cv-00021-BMM, 2018 WL 1475470, at *1 (D. Mont. Mar. 26, 2018), *appeal dismissed*, No. 18-35836, 2019 WL 141346 (9th Cir. Jan. 2, 2019).

⁴⁴⁴ *W. Org. of Res. Councils*, 2018 WL 1475470, at *13–14.

⁴⁴⁵ *WildEarth Guardians*, 368 F. Supp. 3d at 79.

⁴⁴⁶ *Wilderness Workshop*, No. 1:18-cv-00987 (D. Colo. Apr. 26, 2018).

⁴⁴⁷ See, e.g., Laura Schuijers, *Climate Change in Court*, *PURSUIT* (Mar. 3, 2019), <https://pursuit.unimelb.edu.au/articles/climate-change-in-court> [<https://perma.cc/3MTB-3DCP>].

⁴⁴⁸ 40 C.F.R. § 1506.2(d) (2019).

This provision should be interpreted as requiring agencies to consider the consistency of fossil fuel supply projects not only with state policies in the state(s) where the project is located but also with any U.S. states with GHG reduction targets or carbon budgets. It should also be interpreted as requiring consideration of consistency with global and national carbon budgets, since exceedance of those budgets would undermine state efforts to reduce emissions and adapt to climate change.

4. Agencies Must Conduct Balanced Assessments of Costs and Benefits

Where an agency monetizes the benefits of the proposal, it must also monetize the costs of the proposal, including the costs of GHG emissions. This principle was first articulated by the Ninth Circuit Court of Appeals over a decade ago in *Center for Biological Diversity v. National Highway Traffic Safety Administration*, which held that it was arbitrary and capricious for an agency to ignore the impacts of GHG emissions in a regulatory impact analysis, even when there is uncertainty about those impacts: “[W]hile the record shows there is a range of values, the value of carbon emissions reduction is certainly not zero.”⁴⁴⁹ Applying this principle, the Colorado district court in *High Country Conservation Advocates v. U.S. Forest Service* held that USFS must monetize climate impacts from coal leasing where it had monetized economic benefits and directed USFS to use the social cost of carbon protocol in its cost-benefit assessment.⁴⁵⁰ However, the application of this rule is not as straightforward as it may seem. Since *High Country*, there have been at least six decisions involving claims about agency failures to use the social cost of carbon in NEPA documents where benefits were monetized, all of which involved fossil fuel leasing proposals.⁴⁵¹ The decisions reveal that there is room for

⁴⁴⁹ *Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1200 (9th Cir. 2008).

⁴⁵⁰ *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1193 (D. Colo. 2014).

⁴⁵¹ See *Citizens for a Healthy Cmty. v. U.S. Bureau of Land Mgmt.*, 377 F. Supp. 3d 1223 (D. Colo. 2019); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41 (D.D.C. 2019); *WildEarth Guardians v. Zinke*, No. 1:17-cv-00080, 2019 WL 2404860 (D. Mont. Feb. 11, 2019); *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, 342 F. Supp. 3d 1145 (D. Colo. 2018); *W. Org. of Res. Councils v. U.S. Bureau of Land Mgmt.*, No. 4:16-cv-00021-BMM, 2018 WL 1475470 (D. Mont. Mar. 26, 2018); *Mont. Env'tl. Info. Ctr. v. U.S. Off. of Surface Mining*, No. 9:15-cv-00106, 2017 WL 5047901 (D. Mont. Nov. 3, 2017). There are also several pending cases which involve claims about the failure to use the social cost of carbon. See *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, No. 4:18-cv-00073 (D. Mont. May 15, 2018); *WildEarth Guardians v. Zinke*, No. 2:16-cv-00167 (D.

disagreement on the point at which quantification of benefits rises to the level of a “cost-benefit analysis” requiring quantification of costs. In all cases, the reviewing agencies did quantify certain economic benefits in their NEPA documentation—such as labor income and royalty revenue—but argued that disclosure of social costs was not required because the agency had not conducted a complete “cost-benefit analysis” but rather an “economic impact analysis” (or “regional economic analysis”)⁴⁵² or the social cost metrics would not provide a sufficiently accurate and precise cost estimate so as to be helpful to decision makers.⁴⁵³ But in only two of these cases did the reviewing courts require disclosure of social costs.⁴⁵⁴ In the other four cases, courts deferred to agency claims that their economic impact analysis was not a full cost-benefit analysis, and thus no quantification of GHGs was required.⁴⁵⁵

The two decisions requiring disclosure of social costs of GHG emissions were both issued by the Montana district court and both involved a relatively detailed analysis of the agency’s justification for not disclosing these costs. In *Montana Environmental Information Center v. Office of Surface Mining*, the court scrutinized OSM’s argument that its “economic impact assessment” for a coal lease should be distinguished from a “cost-benefit analysis.”⁴⁵⁶ The court noted that OSM had disclosed the economic benefits of the proposal, including royalty and tax revenue and local employment impacts—for example, stating that “the proposed project could contribute \$23,816,000 million [sic] annually in tax revenues to the states.”⁴⁵⁷ In this context, the court found that OSM’s characterization of its analysis was a “distinction without difference where, as here, the economic benefits of the action were quantified where the costs were not.”⁴⁵⁸

Wyo. Apr. 21, 2017); *WildEarth Guardians v. Zinke*, No. 2:16-cv-00166 (D. Wyo. Jan. 27, 2017); *WildEarth Guardians v. Jewell*, No. 2:16-cv-00168 (D. Utah Sept. 11, 2015).

⁴⁵² Agencies will refer to quantification of such benefits as a “regional economic analysis” or an “economic impact analysis” to avoid the requirement to treat costs and benefits equally in their analysis. See, e.g., *Citizens for a Healthy Cmty.*, 377 F. Supp. 3d at 1239–40.

⁴⁵³ See, e.g., Brief for Fed. Gov’t, *WildEarth Guardians v. Zinke*, No. 1:17-cv-00080, 2019 WL 2404860 (D. Mont. Feb. 11, 2019).

⁴⁵⁴ See *WildEarth Guardians*, 2019 WL 2404860, at *12; *Mont. Env’tl. Info. Ctr.*, 2017 WL 5047901, at *5–6.

⁴⁵⁵ See *WildEarth Guardians*, 368 F. Supp. 3d at 79; *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, No. 1:16-cv-01822-WYD (D. Colo. Oct. 17, 2018); *W. Org. of Res. Councils v. U.S. Bureau of Land Mgmt.*, No. 4:16-cv-00021-BMM (D. Mont. Mar. 26, 2018).

⁴⁵⁶ *Mont. Env’tl. Info. Ctr. v. U.S. Off. of Surface Mining*, 274 F. Supp. 3d 1074, 1096 (D. Mont. 2017).

⁴⁵⁷ *Id.* (internal citations omitted).

⁴⁵⁸ *Id.* at 1096 n.9.

In *WildEarth Guardians v. Zinke*, the Montana district court addressed other rationales proffered by OSM for not disclosing social costs.⁴⁵⁹ There, the focus of the decision was not whether a cost-benefit analysis was performed (OSM had quantified the benefits of the proposed action, and thus the court's prior decision was controlling), but whether OSM had a reasonable justification for not using the social cost of carbon in light of the fact that benefits were monetized.⁴⁶⁰ The OSM's first justification was that "there is no consensus on the appropriate fraction of social cost of carbon tied to electricity generation that should be assigned to the coal producer."⁴⁶¹ The court found that this was not persuasive because "it misapprehends NEPA's mandate"—"[u]nder NEPA, agencies are not required to apportion responsibility for the impacts assessed, but rather, they must consider all reasonably foreseeable direct, indirect and cumulative impacts of a proposed action."⁴⁶² Second, OSM argued that it was "uncertain whether [GHG] emissions would actually be reduced if the coal associated with the proposed plan was not mined because power plants have alternative sources for coal."⁴⁶³ The court quickly dismissed this as an unsupported perfect substitution argument.⁴⁶⁴ Third, OSM argued that there were unspecified "uncertainties associated with assigning a specific and accurate social cost of carbon to the Proposed Action."⁴⁶⁵ The court responded that, to the extent the uncertainties OSM cited referred to the fact that the social cost of carbon is expressed as a range of values, this was not a valid justification for not quantifying those costs.⁴⁶⁶ Finally, OSM argued that, to provide meaningful insight, the broader benefits of coal production would need to be considered.⁴⁶⁷ Again, the court found that this was not a persuasive reason for ignoring social costs because OSM had in fact attempted to quantify the economic benefits of the action while ignoring the costs.⁴⁶⁸ The court also confronted an argument from the mining company (an intervenor) that the social cost of carbon protocol should not be used because it was rescinded by the Trump administration.⁴⁶⁹ It responded that:

⁴⁵⁹ *WildEarth Guardians*, 2019 WL 2404860, at *8.

⁴⁶⁰ *Id.* at *9–11.

⁴⁶¹ *Id.* at *11 (internal citations omitted).

⁴⁶² *Id.*

⁴⁶³ *Id.*

⁴⁶⁴ *Id.*

⁴⁶⁵ *WildEarth Guardians*, 2019 WL 2404860, at *12 (internal citations omitted).

⁴⁶⁶ *Id.*

⁴⁶⁷ *Id.*

⁴⁶⁸ *Id.*

⁴⁶⁹ *Id.* at *12 n.7.

Regardless of administration policies that ebb and flow with the political tides, agencies must nevertheless comply with their obligation to properly quantify costs when they have touted economic benefits of a proposed action. The Court's decision here does not mandate use of the SCC Protocol. But it does require OSM to comply with NEPA by either quantifying the costs associated with greenhouse gas emissions or by reasonably justifying why that cannot be done.⁴⁷⁰

The court's careful scrutiny of OSM's justifications in these two cases contrasted to other cases in which courts have deferred to agency decisions on this matter with relatively little analysis.

For example, in a case involving BLM's approval of an RMP that opened lands for fossil fuel development, the Colorado district court accepted BLM's argument that its economic impact analysis was not necessarily the "benefit" side of a cost-benefit analysis without discussing what exactly that analysis entailed.⁴⁷¹ But in the EIS at issue, BLM had quantified labor income, jobs created, and mineral royalty distributions from oil and gas leasing.⁴⁷² The court partially justified its decision on the grounds that BLM had not "expressly relied on anticipated economic benefits in its RMP"—but the economic benefits were discussed and appeared to be an important part of the comparison between alternatives (as evinced by statements about how royalties would be lower under certain alternatives).⁴⁷³ Similarly, in another case which dealt with BLM's approval of several hundred oil and gas leases in Wyoming, Utah, and Colorado, the D.C. district court deferred to BLM's assertion that it had not conducted a full cost-benefit analysis when it discussed the economic benefits of oil and gas drilling in EAs covering the issuance of 282 oil and gas lease sales over more than 303,000 acres in Wyoming.⁴⁷⁴ The court said that *High Country* was not controlling because the EIS at issue in that case predicted economic benefits of nearly a billion dollars, whereas the oil and gas lease sale EAs' discussion of economic benefits was more abbreviated and the quantified economic benefits were much smaller

⁴⁷⁰ *Id.*

⁴⁷¹ *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, 342 F. Supp. 3d 1145, 1159 (D. Colo. 2018).

⁴⁷² *Id.*

⁴⁷³ *Id.*

⁴⁷⁴ *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41 (D.D.C. 2019).

(e.g., one EA estimated that a lease sale would yield \$152,364 in revenue).⁴⁷⁵ The court also deferred to BLM's conclusion that the social cost estimates were "highly speculative" because they represented a "4,000 percent range in potential costs" under different production scenarios, and this would be "less than helpful in informing the public and the decision-maker."⁴⁷⁶ The Colorado district court reached the same conclusion with respect to BLM and USFS's approval of oil and gas leasing in Colorado.⁴⁷⁷

C. *Alternatives and Mitigation to Address GHG Impacts*

NEPA requires federal agencies to consider and disclose mitigation measures for any impacts which are deemed to be significant.⁴⁷⁸ Agencies are not required to discuss mitigation for insignificant impacts.⁴⁷⁹ Thus, in the absence of significance determinations for GHG emissions from fossil fuel supply projects, it is not possible to challenge agency failures to discuss mitigation options by relying exclusively on the regulatory provisions pertaining to mitigation. But the regulations also require agencies to "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated."⁴⁸⁰ Plaintiffs have thus relied on this requirement in lawsuits seeking to compel federal agencies to consider ways in which fossil fuel leasing and transport proposals could be modified to reduce or eliminate emissions.

It is our view that agencies should more rigorously evaluate alternatives and mitigation measures aimed at reducing indirect as well as direct GHG emissions from fossil fuel supply projects, including the no action alternative and alternatives that involve smaller increases in fossil fuel supply (either production or transportation capacity). Federal agencies do sometimes consider alternatives that entail fewer emissions in NEPA reviews of fossil fuel supply projects. For example, in a NEPA documentation for a fossil fuel leasing proposal, an agency might consider different leasing scenarios which entail different acreage and levels of fossil fuel production. And in proposals for broader planning actions

⁴⁷⁵ *Id.* at 78.

⁴⁷⁶ *Id.* at 79 (internal citations omitted).

⁴⁷⁷ *Citizens for a Healthy Cmty. v. U.S. Bureau of Land Mgmt.*, 377 F. Supp. 3d 1223, 1247 (D. Colo. 2019).

⁴⁷⁸ 40 C.F.R. § 1503.3(d) (2019).

⁴⁷⁹ 40 C.F.R. § 1508.13 (2019).

⁴⁸⁰ 40 C.F.R. § 1502.14(a) (2019).

such as RMPs, an agency may compare alternatives with renewable energy production as well as fossil fuel production. But in many instances—particularly where agencies are approving leases or transportation infrastructure—agencies do not give meaningful consideration to alternative approaches for meeting energy demand.⁴⁸¹ Such alternative approaches may be briefly discussed (for thoroughness) but then quickly dismissed from further consideration. This often occurs where the purpose and need of the proposal are framed narrowly—for example, in an EIS for coal leasing, BLM described the need in terms of the public interest (“to meet the nation’s future energy needs”) and the purpose in terms of the applicant’s interest (“to allow the applicant mines access to a continuing supply of low sulfur compliance coal”).⁴⁸² Notably, in the purpose and need statement, BLM also asserted that “the continued extraction of coal is essential to meet the nation’s future energy needs”—effectively foreclosing arguments that the public need for energy could be met through other means.⁴⁸³ This is a problematic position, as it assumes a need for increasing fossil fuel supply at a time when scientific research clearly indicates that we need to reduce fossil fuel consumption.

The Department of State took a similar approach with the Keystone XL pipeline, defining the purpose and need to reflect the developer’s interest in developing the pipeline as well as the public interest in energy demand being met. In *Indigenous Environmental Network v. U.S. Department of State*, the Montana district court held that this practice was permitted under Ninth Circuit case law, and that it was therefore reasonable for the agency to dismiss alternatives that did not satisfy both the public and private interests at stake.⁴⁸⁴ The court also held that it was not necessary to consider a “more environmentally beneficial alternative” but rather only those alternatives that are “necessary to permit a reasoned choice” in light of the purpose and need.⁴⁸⁵ The problem with

⁴⁸¹ See, e.g., *City of Grapevine v. U.S. Dep’t of Transp.*, 17 F.3d 1502, 1506 (D.C. Cir. 1994).

⁴⁸² NAT’L SYS. OF PUB. LANDS, FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE SOUTH GILLETTE AREA COAL LEASE APPLICATIONS 1–19 (2009).

⁴⁸³ *Id.*

⁴⁸⁴ *Indigenous Envtl. Network v. U.S. Dep’t of State*, 347 F. Supp. 3d 561, 573 (D. Mont. 2018).

⁴⁸⁵ *Id.* at 574. Another lawsuit has since been filed challenging the approval of the Keystone XL pipeline which alleges, among other things, that the EIS was flawed because it did not consider an alternative route to avoid the sovereign tribal territory (which was contemplated in the scoping report). That complaint also argues that the Department of State’s approval of the Keystone XL Pipeline violates the APA because the Department failed to justify its reversal in light of the previous factors which led it to deny the permit,

this interpretation of NEPA is that it allows agencies to define the project need so narrowly based on private interests that they can avoid any real consideration of alternatives that may better serve the public interest.

The decision in *Indigenous Environmental Network* can be contrasted to several decisions finding that BLM failed to take a hard look at alternatives that would have decreased fossil fuel leasing on federal lands, all of which reflect a more functional interpretation of NEPA requirements for the alternatives analysis.⁴⁸⁶ First, in *New Mexico ex rel. Richardson v. Bureau of Land Management*, the Tenth Circuit Court of Appeals held that BLM violated NEPA by failing to consider an alternative in an RMP that would have closed the managed area to future minerals development, since such an option was within the scope of BLM's discretion as well as BLM's statutory mandate to manage lands on a mixed use basis.⁴⁸⁷ The case did not entail any claims related to climate change or GHG emissions, but it set the stage for two additional decisions which focused on the need to restrict leasing options in order to reduce the emissions impact. In one case, the Montana district court found that BLM had failed to take a hard look at coal leasing alternatives in two RMP EISs that would have decreased the amount of coal available for leasing based on climate concerns.⁴⁸⁸ The BLM had examined a total of nine alternatives in the two EISs, all of which entailed the same acreage available for leasing and the same projected coal production.⁴⁸⁹ The court held that BLM had discretion to reduce or eliminate areas from lease sales, and thus the lower production scenarios were reasonable management

in particular its assessment of climate change impacts, but the NEPA claims focus on the lack of assessment of impacts on and alternatives to the route through tribal lands. Complaint at 51, *Rosebud Sioux Tribe v. U.S. Dep't of State*, No. 4:18-cv-00118 (D. Mont. Sept. 10, 2018).

⁴⁸⁶ There is another pending case, *Diné Citizens Against Ruining Our Environment v. Bureau of Indian Affairs*, in which plaintiffs have alleged that the federal government unlawfully truncated its alternatives analysis for a connected coal mining and coal plant operation. There, plaintiffs are arguing that the purpose and need statement ("to continue operations of the Navajo Mine and the Four Corners Power Plant") is unduly narrow, thus preventing meaningful consideration of lower GHG alternatives. The case was dismissed by a district court due to failure to join an essential party and the Ninth Circuit upheld the dismissal. *Diné Citizens Against Ruining Our Env't v. Bureau of Indian Affairs*, 932 F.3d 843, 848 (9th Cir. 2019).

⁴⁸⁷ *N.M. ex rel. Richardson v. U.S. Bureau of Land Mgmt.*, 565 F.3d 683, 703 n.23 (10th Cir. 2009).

⁴⁸⁸ *W. Org. of Res. Councils v. U.S. Bureau of Land Mgmt.*, 2018 WL 1475470, at *13–14, *appeal dismissed*, No. 18-35836, 2019 WL 141346 (9th Cir. Jan. 2, 2019).

⁴⁸⁹ *Id.* at *19–20.

options which should be considered to provide a reasoned basis for decision-making, particularly in light of the potential emissions from the fossil fuels produced pursuant to the RMPs and public comments outlining concerns about the climate impacts.⁴⁹⁰ However, the court did not agree with another claim advanced by plaintiffs with respect to the alternatives analysis—specifically, that BLM must also consider alternatives to reduce methane pollution from oil and gas development contemplated in the RMPs. The court held that consideration of such measures was not required at the RMP stage—it characterized the RMP EISs as “programmatic” reviews—and noted that BLM would retain the ability to impose specific methane mitigation measures at the leasing stage.⁴⁹¹

Similarly, in *Wilderness Workshop v. Bureau of Land Management*, the Colorado district court held that BLM should have considered an oil and gas leasing alternative that would “meaningfully limit” oil and gas production development.⁴⁹² Notably, BLM had considered various alternatives that entailed less oil and gas leasing—but none of them closed more than 25.7 percent of the study area to future leasing—and much of the area left open for leasing under all alternatives had only “moderate or low” potential for oil and gas development.⁴⁹³ The court held that BLM must consider an alternative in which more of the lands were closed to leasing so that it could better evaluate alternate land management options for the “moderate or low” potential areas—thus, the court’s decision was predicated more on the need for BLM to meaningfully implement the principle of “mixed use” on public lands than on the need to evaluate a more environmentally friendly alternative.⁴⁹⁴

These three decisions thus demonstrate that courts may intervene to enforce the requirement that agencies take a “hard look” at alternatives that entail different levels of fossil fuel production at the land use planning stage, but may be more deferential to agencies about the scope of other emission mitigation measures reviewed at this stage. The Colorado district court addressed the obligation to consider methane mitigation measures at the leasing stage in the context of the EIS prepared for coal leasing on remand from *High Country Conservation Advocates*.⁴⁹⁵ In the

⁴⁹⁰ *Id.*

⁴⁹¹ *Id.* at *28.

⁴⁹² *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, 342 F. Supp. 3d 1145, 1164 (D. Colo. 2018).

⁴⁹³ *Id.* at 1166.

⁴⁹⁴ *Id.* at 1153.

⁴⁹⁵ *High Country Conservation Advocates v. U.S. Forest Serv.*, 333 F. Supp. 3d 1107, 1124 (D. Colo. 2018).

leasing EIS, USFS had briefly discussed methane flaring as a potential mitigation measure, but put off the decision on whether to require methane flaring to a later point in time. The USFS stated that it had not considered methane flaring in detail “because it, like all other methane mitigation measures, requires detailed engineering and economic considerations that would occur later in the process.”⁴⁹⁶ The USFS also incorporated lease stipulations requiring “additional analysis” of the feasibility of methane use or capture.⁴⁹⁷ The court held that USFS’s treatment of methane mitigation measures was adequate and that USFS had satisfied its obligation to “briefly discuss” why the option would eliminate from detailed consideration as an alternative.⁴⁹⁸

CONCLUSION

The contribution of fossil fuel supply projects to GHG emissions and climate change is precisely the sort of environmental impact that requires a “hard look” under NEPA. As detailed in this Article, there are now numerous court decisions fleshing out the required scope and nature of the GHG analysis that must be performed for fossil fuel projects. In particular, courts have made it clear that agencies must carefully evaluate indirect emissions from such proposals, at minimum considering the effect of the proposal on downstream consumption of fossil fuels, and that emissions must be quantified wherever tools and data are available to do so. There are also a number of cases addressing other aspects of the GHG analysis, such as the proper scope of the cumulative emissions analysis, the adequacy of technical assumptions underpinning estimates of net emissions, and the contexts in which the social costs of emissions must be disclosed. These cases show that courts are generally deferential to agencies regarding decisions about how to best analyze GHG impacts, but that courts will intervene as needed to ensure that agencies do not wholly ignore GHG impacts or analyze them in an irrational way. Here, we summarize some recommendations to agencies and courts on the best approach for analyzing GHG emissions from fossil fuel supply projects under NEPA,

⁴⁹⁶ *Id.*

⁴⁹⁷ *Id.*

⁴⁹⁸ *Id.* at 1120–21 (citing 40 C.F.R. § 1502.14(a)). The Court affirmed USFS’s decision to rule out methane flaring and capture as infeasible at the same mine, because the intervening years have provided “additional evidence . . . that flaring operations are safe” and plaintiffs provided a report showing that methane flaring would be economically feasible. *Id.* at 1125. See also *WildEarth Guardians v. U.S. Forest Serv.*, 828 F. Supp. 2d 1223, 1239 (D. Colo. 2011).

recognizing that there is not yet judicial consensus that all of these elements are required under NEPA, but that it makes sense to err on the side of greater disclosure for public policy reasons as well as legal reasons.⁴⁹⁹

First, agencies should include a complete inventory of direct and indirect emissions in NEPA documents for fossil fuel supply proposals, including all downstream and (if applicable) upstream emissions from other activities on the supply chain. Emissions should be quantified wherever possible, and in particular, combustion emissions should be quantified using emission factors whenever the agency is able to project the amount of fuel to be produced.⁵⁰⁰ For larger proposals, agencies may also supplement this gross GHG inventory with a quantitative or qualitative discussion of energy market substitution and net emissions, provided that the agency uses the best available data on energy markets and substitutes and is transparent about all assumptions, model parameters, and limitations to that analysis. Where agencies model energy market impacts, they should use multiple scenarios to account for uncertainty.⁵⁰¹

Second, we recommend that agencies consider the effects of other reasonably foreseeable fossil fuel supply projects in their cumulative effects analysis for such proposals. Ideally, this analysis should encompass federal activities at both the regional and national scales (e.g., other federal leases for coal, oil, and/or gas) and should help decision makers and the public understand both the incremental contribution of the proposal under review and the aggregate impacts of federal decision-making on similar projects. One goal of this analysis should be to evaluate whether the proposal is prudent and whether impacts may be significant in light of other federal leases or approvals for fossil fuel supply projects. Agencies should also account for such cumulative impacts when modelling energy market impacts and net emissions (and should consider whether the market impact analysis should be integrated with the cumulative effects analysis).

Third, agencies should carefully evaluate the significance of the emissions impacts in light of the regulatory criteria outlined in the NEPA regulations. Agencies should not avoid reaching a determination on

⁴⁹⁹ Most of these recommendations are written in terms of what agencies should do, but that these are also intended to provide guidance to courts when assessing whether agencies have met their obligations under NEPA.

⁵⁰⁰ See Burger & Wentz, *supra* note 11, for more detailed guidance on the preparation of a GHG inventory for direct and indirect emissions, including a list of tools available to quantify upstream and downstream emissions.

⁵⁰¹ See *supra* Section III.A.2 for more detailed recommendations on the use of energy market models.

significance due to a lack of predetermined significance thresholds for GHG emissions. Rather, agencies should use all available tools to evaluate the magnitude of the emissions impact and reach a reasonable conclusion about significance based on that analysis. Although courts have not required agencies to disclose the social costs of emissions except where agencies have conducted a cost-benefit analysis, agencies should consider using the social cost metrics regardless to aid in their evaluation of significance. When determining whether such social costs must be disclosed, courts should closely scrutinize agency claims that the disclosure of key economic benefits (such as government revenue or job creation) does not constitute the “benefits” side of a “cost-benefit analysis.” The relevant inquiry is not how the agency has labelled the analysis, but rather whether the agency has put its “thumb on the scale” by inflating or emphasizing benefits and downplaying costs.

Fourth, we recommend that agencies carefully consider alternatives to fossil fuel supply proposals that will help meet energy demand without generating the same amount of GHG emissions in their NEPA analysis. Agencies should not narrowly frame the purpose and need of proposals to exclude such alternatives from consideration, particularly in light of the urgent public need to transition from fossil fuels to alternative energy sources.