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Downstream and Upstream Greenhouse Gas Emissions:

The Proper Scope of NEPA Review

By Michael Burger and Jessica Wentz

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The Sabin Center for Climate Change Law develops legal techniques to fight climate change, trains law students and lawyers in their use, and provides the legal profession and the public with up-to-date resources on key topics in climate law and regulation. It works closely with the scientists at Columbia University's Earth Institute and with a wide range of governmental, non-governmental and academic organizations.

Sabin Center for Climate Change Law
Columbia Law School
435 West 116th Street
New York, NY 10027
Tel: +1 (212) 854-3287
Email: columbiaclimate@gmail.com
Web: http://www.ColumbiaClimateLaw.com
Twitter: @ColumbiaClimate
Blog: http://blogs.law.columbia.edu/climatechange

About the authors: Michael Burger is the Executive Director of the Sabin Center for Climate Change Law, and a Research Scholar and Lecturer-in-Law at Columbia Law School. He can be reached at mburger@law.columbia.edu. Jessica Wentz is an Associate Director and Fellow at the Sabin Center for Climate Change Law. She can be reached at jwentz@law.columbia.edu.

ABSTRACT

Recently, legal controversies have arisen regarding the scope of greenhouse gas emissions that should be considered in environmental reviews of fossil fuel extraction and transportation proposals under the National Environmental Policy Act (NEPA). The key question is whether and how agencies should account for emissions from activities that occur "downstream" from the proposed action, such the combustion of fossil fuels, and emissions from activities that occur "upstream" of the proposed action, such the extraction of fossil fuels. This question is important, because consideration of such emissions can alter the balance of costs and benefits for a proposed project, and the agency's ability to justify approving the project in light of that balance.

This Article argues that such emissions do typically fall within the scope of indirect and cumulative impacts that must be evaluated under NEPA, and provides recommendations on how agencies should evaluate such emissions in environmental review documents. To support the argument and recommendations, the Article makes several unique contributions to the growing literature on NEPA and climate change. First, we describe how federal approvals of fossil fuel extraction and infrastructure contribute to global climate change, and we explain why federal agencies have ample discretion to account for these impacts when deciding whether to issue such approvals. Second, we conduct an in-depth examination of NEPA's requirements as they pertain to the analysis of upstream and downstream emissions, focusing in particular on the requirements to evaluate indirect effects, cumulative effects, and effects from related actions. Third, we describe how federal agencies currently account for upstream and downstream greenhouse gas emissions in their NEPA reviews, and we find that there are major inconsistencies in the analytical approaches both within and across agencies, but many agencies are nonetheless beginning to recognize that upstream and downstream emissions fall within the scope of impacts that should be reviewed under NEPA. Fourth, we synthesize all of the existing case law on this subject, and we find that courts have generally treated such emissions as the type of indirect effects that must be evaluated in a NEPA reviews. Finally, we outline an approach for evaluating upstream and downstream emissions that would improve the quality of federal decision-making, shield agencies from litigation, and provide much-needed information about the indirect and cumulative effects of fossil fuel development on global climate change.

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INTRODUCTION

The nations of the world have agreed that in order to avoid the worst impacts of climate change we must limit global warming to "well below" a 2 °C increase above pre-industrial temperatures, and seek to limit it to 1.5 °C.[1] It is a hard pill for some to swallow, but the only way to achieve this goal is to refrain from extracting and using the majority of the planet's known fossil fuel reserves. Indeed, according to a recent scientific study, 80% of global coal reserves, 50% of gas reserves, and about 30% of oil reserves must remain unused to meet a 2 °C target.[2] Governments and industry will need to be even more conservative with these resources to keep global warming well below 2 °C, or at 1.5 °C. As climate activists have put it: If the planet is to avoid the worst impacts of climate change we need to "keep it in the ground."[3]

The United States has been slow to respond to this imperative.[4] In the past decade, federal agencies have approved thousands of new leases for coal, oil and gas development, as well as hundreds of pipelines, railways and export terminals that are used to transport fossil fuels to domestic and international markets.[5] The approval of these leases and the construction of this infrastructure locks the economy into decades of fossil fuel use and its corresponding greenhouse gas emissions.[6] Take, for example, federal coal leasing—the amount of coal reserves already under

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[1] *Paris Agreement, Article 2*, FCC/CP/2015/L.9 (Dec. 12, 2015).

[2] Christophe McGlade & Paul Ekins, *The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2 ℃*, 517 NATURE 187 (2015).

[3] *See, e.g.*, *Keep It in the Ground*, GREENPEACE, http://www.greenpeace.org/usa/global-warming/keep-it-in-the-ground/ (last visited March 9, 2016).

[4] The U.S. is not alone in this regard. According to the International Energy Agency's statistics on fossil fuel production in 2012, the U.S. production accounted for 12% of global coal production and 15% of global oil production (global totals are not available for natural gas production). In contrast, China accounted for 46% of global coal production and 5% of global oil production. *International Energy Statistics*, ENERGY INFO. ADMIN., http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm (last visited March 9, 2016).

[5] *See Oil and Gas Statistics*, BUREAU OF LAND MGMT., http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/statistics.html (last visited March 9, 2016); *Coal Lease Statistics*, BUREAU OF LAND MGMT., http://www.blm.gov/wo/st/en/prog/energy/coal_and_non-energy/coal_lease_table.html (last visited March 9, 2016); *OCS Lease Sale Statistics*, BUREAU OF OCEAN & ENERGY MGMT., http://www.boem.gov/OCS-Lease-Sale-Statistics-All-Lease-Offerings/ (last visited March 9, 2016); *Approved Major Pipelines*, FED. ENERGY REGULATORY COMM'N, http://www.ferc.gov/industries/gas/indus-act/pipelines/approved-projects.asp (last visited March 9, 2016); *North American LNG Import/Export Terminals, Approved*, FED. ENERGY REGULATORY COMM'N, https://www.ferc.gov/industries/gas/indus-act/lng/lng-approved.pdf (last visited March 9, 2016).

[6] To illustrate this point, federal coal leases have initial terms of 20 years and so long thereafter as production in commercial quantities is maintained. The average length of an oil or gas lease is 10-years, and the lease automatically

lease are estimated to be enough to sustain current levels of production for approximately twenty years.[7]

A significant part of the problem is that federal agencies have been slow to use the National Environmental Policy Act (NEPA) to fully evaluate how decisions about the extraction and transportation of fossil fuels contribute to global climate change. NEPA is designed to promote knowledge, disclosure and accountability in federal decision-making, and to ensure that government actors are making choices based on a sound understanding of the environmental impacts of a proposed course of action.[8] However, as discussed more fully in the sections that follow, federal agencies conducting environmental reviews for coal, oil and gas leases have only recently begun to disclose the downstream greenhouse gas emissions that will occur as a result of the transportation, processing, and combustion of these fuels. And when conducting environmental reviews for the pipelines and terminals intended to transport coal, oil, and gas to markets, agencies rarely consider the direct and indirect effects of such infrastructure on greenhouse gas emissions associated with either upstream production or downstream consumption of the transported fuels. Agencies also tend to evaluate the effects of each decision in isolation, rather than conducting programmatic reviews to evaluate how multiple lease approvals, pipeline authorizations, and other decisions may affect fossil fuel use and greenhouse gas emissions. The net effect of this analytic gap is that neither the agencies nor the public have a clear understanding of how these individual decisions impact the nation's overall climate goals.

This Article argues that consideration of how fossil fuel lease and infrastructure approvals will indirectly and cumulatively effect global greenhouse gas emissions is not merely a matter of good policy—it is also required under NEPA. The statute's implementing regulations require

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continues so long as there is a well on the lease capable of producing in paying quantities, or the lease can receive an allocation of production from an off-lease well capable of producing in paying quantities. *See Oil and Gas, Questions and Answers About Leasing*, BUREAU OF LAND MGMT., http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/questions_and_answers.html (last visited March 10, 2016); *Coal Operations*, BUREAU OF LAND MGMT., http://www.blm.gov/wo/st/en/prog/energy/coal_and_non-energy.html (last visited March 10, 2016); Bureau of Land Mgmt., Form 3400-12 (Coal Lease); Bureau of Land Mgmt., Form 3100-11 (Offer to Lease and Lease for Oil and Gas).

[7] *Press Release: Secretary Jewell Launches Comprehensive Review of Federal Coal Program*, DEPT. OF INTERIOR (DOI) (January 15, 2016).

[8] *See, e.g.*, Bradley Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing Government's Environmental Performance*, 102 COLUM. L. REV. 93 (2002); Sidney A. Shapiro, *Administrative Law After the Counter-Reformation: Restoring Faith in Pragmatic Government*, 48 U. KAN. L. REV. 689, 693-96 (2000); Jonathan Poisner, *A Civic Republican Perspective on the National Environmental Policy Act's Process for Citizen Participation*, 26 ENVTL. L. 53, 54-55 (1996).

federal agencies to consider the direct, indirect, and cumulative environmental effects of proposed actions prior to undertaking those actions. The regulations also require agencies to conduct a coordinated environmental review of "related" actions, including actions that are interdependent parts of a larger whole and actions that have cumulatively significant impacts on the environment. The purpose of these requirements is to ensure that agencies account for the full range of environmental consequences associated with their actions, both individually and in aggregate. Such a comprehensive review is necessary to fulfill NEPA's twin aims of informed decision-making and public disclosure.

The question of whether NEPA requires upstream and/or downstream greenhouse gas emissions analysis, and if so in what contexts, is presently being bandied about in the courts. Dozens of federal approvals related to fossil fuel development have been challenged in the past few years for failing to comply with NEPA's requirements. There are now at least seven decisions holding that agencies are required to consider upstream and/or downstream emissions in the context of certain types of proposals, such as the approval of coal leasing plans and railways intended to transport coal from mines to power plants. The D.C. Circuit also recently ruled that the Federal Energy Regulatory Commission (FERC) must conduct a consolidated environmental review of gas pipeline segments, because the approvals of these segments were connected actions within the meaning of NEPA.[9] There are some diverging opinions, but the emerging trend in courts examining this issue is that agencies should evaluate specific decisions about fossil fuel extraction and transportation as links in a much larger chain of fossil fuel production and consumption. This only makes sense. The cumulative effect of greenhouse gas emissions from fossil fuel projects in the United States is significant. In addition, greenhouse gas emissions can be meaningfully evaluated even when there is considerable uncertainty about the exact timing and location of the activities giving rise to the emissions.[10]

[9] Delaware Riverkeeper Network v. Fed. Energy Regulatory Comm'n, 753 F.3d 1304, 1308-09 (D.C. Cir. 2014).

[10] Some impacts—such as the effect of coal combustion and local air and water quality—may be difficult to evaluate in a manner that is helpful for decision-makers if the precise timing and location of the activity giving rise to those impacts is unknown. But greenhouse gas emissions have global rather than local impacts, and thus an agency can quantify upstream and downstream greenhouse gas emissions without specifying exactly when or where the emissions will occur, and this information is still useful for decision-makers.

Fortunately, some federal agencies have begun to change their practices in response to public pressure, court decisions and more specific direction from the Council on Environmental Quality (CEQ). CEQ—the agency tasked with developing the regulations that implement NEPA—published draft guidance in 2014 which instructs agencies to consider both upstream and downstream emissions in their NEPA analysis,[11] and to use programmatic assessments to evaluate the effect of certain decisions (including oil and gas lease authorizations) on climate change.[12] In accordance with this guidance, the Department of Interior (DOI) announced in January 2016 that it will conduct a programmatic environmental review of the federal coal leasing program, which will include consideration of greenhouse gas emissions from coal combustion.[13] But other agencies, such as FERC and the Bureau of Ocean and Energy Management (BOEM), have maintained that upstream and downstream emissions do not fall within the scope of indirect impacts that must be evaluated under NEPA.[14]

This Article adds to the growing literature on NEPA and climate change analysis by clarifying when and how agencies should evaluate upstream and downstream greenhouse gas emissions under NEPA.[15] Part I describes the approval process for fossil fuel extraction and transportation projects, the extent to which agencies have discretion to account for environmental considerations when issuing such approvals, and the contributions these decisions make to global greenhouse gas emissions. Part II outlines the statutory and regulatory requirements of NEPA,

[11] 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, 77,826 (Council on Envtl. Quality, Dec. 24, 2014) [hereinafter "Revised Draft Guidance"].

[12] *Id.* at 77,830.

[13] Order No. 3338, Discretionary Programmatic Environmental Statement to Modernize the Federal Coal Program (Dept. of Interior, Jan 15, 2016).

[14] *See, e.g.,* Order Denying Rehearing, Sabine Pass Liquefaction Expansion, LLC Sabine Pass LNG L.P., Cheniere Creole Trail Pipeline, L.P., 151 FERC ¶ 61,253, 62,671-73 (June 23, 2015); BUREAU OF OCEAN & ENERGY MGMT., OUTER CONTINENTAL SHELF OIL AND GAS LEASING PROGRAM: 2012-2017, FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT 8-37 (July 2012).

[15] Earlier studies include JESSICA WENTZ ET AL., SABIN CENTER FOR CLIMATE CHANGE LAW, SURVEY OF CLIMATE CHANGE CONSIDERATIONS IN FEDERAL ENVIRONMENTAL IMPACT STATEMENTS, 2012-2014 (2016); AIMEE DELACH ET AL., DEFENDERS OF WILDLIFE, REASONABLY FORESEEABLE FUTURES: CLIMATE CHANGE ADAPTATION AND THE NATIONAL ENVIRONMENTAL POLICY ACT (2013); PATRICK WOOLSEY, CENTER FOR CLIMATE CHANGE LAW, WHITE PAPER ON THE CONSIDERATION OF CLIMATE CHANGE IN FEDERAL EISS, 2009-2011 (2012); Amy Stein, *Climate Change Under NEPA: Avoiding Cursory Consideration of Greenhouse Gases*, 81 U. COLO. L. REV. 473 (2010); Madeline June Kass, *A NEPA Climate Paradox: Taking Greenhouse Gases Into Account in Threshold Significance Determinations*, 42 IND. L. REV. 47 (2009). For an examination of how climate change may factor into environmental reviews conducted under the states' "baby NEPAs," *see* Dave Owen, *Climate Change and Environmental Assessment Law*, 33 COLUM. J. ENVTL. L. 57 (2008).

focusing in particular on the requirements to evaluate indirect effects and effects of connected actions. Part III describes how various agencies are currently evaluating downstream and upstream emissions in NEPA reviews for fossil fuel-related approvals, one key finding being that there are major inconsistencies in analytical approaches both within and across different agencies. Part IV summarizes and synthesizes the case law involving agencies' obligations to evaluate upstream and downstream emissions in NEPA reviews, and finds that the courts have generally treated such emissions as the type of indirect effects that must be evaluated in a NEPA reviews.

Finally, Part V offers specific recommendations on the scope of greenhouse gas emissions that should be included in the NEPA analysis for federal approvals related to coal, oil and gas extraction and transportation. Our goal is to describe a more consistent approach to environmental reviews which would improve the quality of federal decision-making, shield agencies from litigation, and provide much-needed information about the aggregate effects of fossil fuel development on greenhouse gas emissions and climate change. The federal government could use this information to make more prudent decisions about lease terms, royalties, tax breaks, and public investments in fossil fuel infrastructure, and to develop a long-term plan for phasing out fossil fuel production and consumption in the United States, consistent with our international commitments on climate change.

I. FEDERAL DECISION-MAKING, FOSSIL FUEL DEVELOPMENT AND GREENHOUSE GAS EMISSIONS

This section provides a brief background on the statutory structure for federal leases and approvals for fossil fuel production, processing and transportation infrastructure, and the contributions these decisions make to global greenhouse gas emissions. The review makes plain that agencies are well-positioned to conduct meaningful analysis of emissions during their decision-making processes, but by and large have not done so, leaving behind an information gap that needs to be filled.

A. Federal Authority over the Extraction of Fossil Fuels from Federal Lands

The federal government owns a considerable share of the coal, oil and gas reserves in the country. In 2014, sales of fossil fuels produced on federal lands totaled 15,975 trillion Btu, almost one quarter of U.S. total sales. These included 402 million short tons of coal (40.8% of U.S. total sales), 651 million barrels of crude oil and lease condensate (21.4%), 3,551 billion cubic feet of natural gas (14.1%), and 117 million barrels of natural gas plant liquids (11.3%).[16] The Bureau of Land Management (BLM), located within the Department of Interior (DOI) oversees oil, natural gas, and coal leasing and production on federal lands. The U.S. Forest Service (USFS), located within the Department of Agriculture, oversees fossil fuel production on National Forest Service (NFS) lands in conjunction with BLM. USFS determines whether NFS lands will be open for fossil fuel development and whether such development will be subject to constraint.[17] The Bureau of Ocean and Energy Management (BOEM), also housed within DOI, oversees offshore oil and gas leasing and production.[18]

The Mineral Leasing Act grants broad discretion to these agencies to decide how and whether to lease federal lands for fossil fuel development.[19] The Act also directs the agencies to consider the "public interest" when making decisions about how and whether to issue leases for coal, oil and gas extraction.[20] The Act does not specifically require that federal lands be made available for fossil fuel leases. On two occasions, the federal government has issued a moratorium

[16] U.S. ENERGY INFO. ADMIN., SALES OF FOSSIL FUELS PRODUCED FROM FEDERAL AND INDIAN LANDS FY 2003 THROUGH FY 2014 (July 2015).

[17] For more information about federal oversight of fossil fuel development on federal lands, see ADAM VANN, CONG. RESEARCH SERV., ENERGY PROJECTS ON FEDERAL LANDS: LEASING AND AUTHORIZATION (2012).

[18] For more information about federal oversight of offshore oil and gas development, see ADAM VANN, CONG. RESEARCH SERV., OFFSHORE OIL AND GAS DEVELOPMENT: LEGAL FRAMEWORK (Congressional Research Service (2014).

[19] *See* 30 U.S.C. § 226(a) (lands "known or believed to contain oil or gas deposits may be leased by the secretary"); 30 U.S.C. § 201 (the secretary is "authorized to divide any lands subject to this chapter which have been classified for coal leasing into leasing tracts of such size as he finds appropriate and in the public interest and which will permit the mining of all coal which can be economically extracted in such tract and thereafter he shall, in his discretion, upon the request of any qualified applicant or on his own motion, from time to time, offer such lands for leasing and shall award leases thereon by competitive bidding").

[20] *See, e.g.*, 30 U.S.C. § 201 (secretary should divide coal leasing into leasing tracts of such size as he finds appropriate and in the public interest); 30 U.S.C. § 226(m) (secretary may authorize and modify cooperative oil and gas leases, so long as he has consent from lessees and the modifications are "necessary or proper to secure the proper protection of the public interest"); 30 U.S.C. § 208 (secretary may authorize the take of coal from public lands without payment if it will "safeguard the public interests"); 30 U.S.C. § 2015 (secretary may authorize consolidation of leases if it is in the public interest); 30 U.S.C. § 192 (secretary may reject bids for oil and gas that is paid as royalty to the U.S. if accepting the offer would not serve the public interest).

on such leases. First, in the late 1920s, when crude oil prices were plummeting, President Hoover ordered the Interior Department to cease all oil leasing. The Supreme Court upheld the moratorium, noting that the statute "goes no further than to empower the Secretary to execute leases which, exercising a reasonable discretion, he may think would promote the public welfare."[21] The second moratorium began in January 2016, when the Department of Interior announced a three-year moratorium on federal coal leasing, pending a reevaluation of the leasing program's environmental, social and economic effects.[22]

B. Federal Authority Over the Transportation and Processing of Fossil Fuels

The federal government also has considerable oversight over the construction of infrastructure that is used to process and transport fossil fuels to domestic and international markets. FERC has exclusive 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.[23] In addition, the Department of Energy (DOE)'s authorization is required prior to the import or export of natural gas to or from a non-free trade agreement country.[24] Similarly, the Surface Transportation Board (STB) has exclusive licensing authority for the construction and operation of rail lines, which provide the primary mode of transport for coal.[25] The federal government does not have equivalent authority over the construction of oil pipelines. However, these projects may nonetheless require federal approvals that trigger the environmental review process under NEPA. For example, a Presidential Permit is required for pipelines and other infrastructure used for the exportation or importation of petroleum and

[21] U.S. ex rel. McLennan v. Wilbur, 283 U.S. 414, 419 (1931).
[22] Order No. 3338, Discretionary Programmatic Environmental Statement to Modernize the Federal Coal Program (Dept. of Interior, Jan 15, 2016).
[23] 15 U.S.C. § 717f(c) (prohibiting the construction and operation of interstate natural gas pipelines and associated infrastructure without FERC authorization); 15 U.S.C. § 717b(e) (granting FERC "exclusive authority to approve or deny an application for the siting, construction, expansion, or operation of an LNG terminal").
[24] 15 U.S.C. §717b(a) (granting the Federal Power Commission authority to approve or deny natural gas exports), 42 U.S.C. §7172(f) (clarifying that the functions of the Federal Power Commission that were delegated to FERC do not include any function "which regulates the exports or imports of natural gas or electricity" unless the Secretary of Energy assigns such a function to FERC).
[25] 49 U.S.C. § 10901(a).

petroleum products,[26] and a Clean Water Act Section 404 permit is required for any project that involves the discharge of dredged and/or fill materials into navigable waters, tributaries, and adjacent wetlands. [27]

Before approving any proposal to construct interstate natural gas infrastructure, LNG terminals, or rail lines, the responsible agency must issue a "certificate of public convenience and necessity" for the project.[28] With respect to natural gas approvals, the Supreme Court has held that FERC must evaluate "all factors bearing on the public interest" before issuing such a certificate.[29] With respect to railroad approvals, the Supreme Court has noted that the purpose of the certificate of public convenience and necessity is to protect the public interest,[30] and that STB should consider the "infinite variety of circumstances which may occur in specific instances" when issuing such a certificate.[31] In both cases, it is clear that the agencies have discretion to consider environmental effects when deciding whether the proposed infrastructure would serve the public interest, and may even condition their approvals on the implementation of measures to mitigate foreseeable environmental harms.[32] The State Department has similarly broad discretion to consider a variety of public interest factors when issuing President Permits for oil pipelines or other infrastructure intended to export or import oil.[33] The one exception is the issuance of Section 404 permits for dredge and fill activities. The U.S. Army Corps of Engineers (Corps) is required to evaluate

[26] See Exec. Order 11423. 3 C.F.R. 742 (1968), ; Executive Order 13337, 3 C.F.R. 13337 (2004); ADAM VANN & PAUL W. PARFOMAK, CONG. RESEARCH SERV., R43261, PRESIDENTIAL PERMITS FOR BORDER CROSSING ENERGY FACILITIES, CRS REPORT R43261 (2013)

[27] Clean Water Act, § 404, 33 U.S.C. § 1344.

[28] 15 U.S.C. § 717f(c) (natural gas infrastructure); 49 U.S.C. § 10901(a) (railways).

[29] Fed. Power Comm'n v. Transcon. Gas Pipe Line Corp., 365 U.S. 1, 8 (1961).

[30] Chesapeake & O. Ry. Co. v. United States, 283 U.S. 35, 42 (1931).

[31] I. C. C. v. Parker, 326 U.S. 60, 65 (1945).

[32] See, e.g., N. Plains Res. Council, Inc. v. Surface Transp. Bd., 668 F.3d 1067, 1095 (9th Cir. 2011) (it was appropriate for STB to rely on environmental documents when conducting public convenience and necessity test); Minisink Residents for Environmental Preservation and Safety v. F.E.R.C., 762 F.3d 97 (FERC satisfied its obligation to consider alternatives in granting a certificate of public convenience and necessity for construction of a natural gas compressor station; FERC explored an alternative site for station and concluded that it was less preferable due to increased number of environmental impacts that would arise from pipeline operator's need to upgrade a segment of its network if alternative site was chosen); Midcoast Interstate Transmission, Inc. v. Fed. Energy Regulatory Comm'n, 198 F.3d 960 (FERC satisfied its obligation to consider alternatives in granting a certificate of public convenience and necessity for construction of interstate natural gas pipeline; it carefully evaluated environmental effects of all alternatives, and conditioned the certificate on the applicant's compliance with certain mitigation measures).

[33] Exec. Order 13337, 3 C.F.R. 13337, § 1(g) (2004) (authorizing the Secretary to issue a Presidential Permit if such authorization will "serve the national interest"). *See also* ADAM VANN & PAUL W. PARFOMAK, CONG. RESEARCH SERV. R43261, PRESIDENTIAL PERMITS FOR BORDER CROSSING ENERGY FACILITIES (2013).

impacts on water resources before issuing the permit, but the statute and regulations do not authorize the Corps to reject a permit due to concerns about air quality or greenhouse gas emissions.[34] The Corps' limited authority is linked to the limited nature of the approval—the Corps is only authorizing dredge and fill activities, as opposed to the construction of a pipeline or other infrastructure intended to transport fossil fuels.

C. Greenhouse Gas Emissions from Fossil Fuels Produced from Federal Lands

The greenhouse gas emissions from federal leasing approvals and other decisions affecting the production of fossil fuels from federal lands can be divided into two categories: (1) direct emissions associated with the production of those fuels, and (2) indirect or "downstream" emissions that occur as a result of the transportation, processing and end use of those fuels. The first category—direct emissions—are typically discussed in environmental review documents, although the quality and scope of the analysis varies substantially.[35] The Environmental Protection Agency (EPA)'s *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013* estimates the direct emissions in 2013 from coal mining (64.6 MMT CO_{2e}),[36] natural gas production (62.9 MMT CO_{2e}),[37] and oil production (24.7 MMT CO_{2e}).[38] But these figures do not include any combustion-related emissions from equipment and vehicles used in mining and drilling operations. There are some EISs that include a complete inventory of direct emissions for specific proposals, including emissions from equipment, but no official federal estimate of aggregate emissions from all federal leasing activity.

Direct emissions from production represent only a small proportion of the life cycle emissions from the fossil fuels that are produced as a result of the public land leases.

[34] Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material, 40 C.F.R. Pt. 210. *See also* Timothy J. Hagerty, *Beyond Section 404: Corps Permitting and the National Environmental Policy Act*, 32 ELR 10853 (2002) (discussing the scope of NEPA review for Section 404 permits).

[35] This was not always the case. The number of EISs that discuss greenhouse gas emissions has increased in the past few years as a result of the Council on Environmental Quality (CEQ)'s draft guidance on climate change and NEPA, originally published in 2010 and revised in 2014. *See* Wentz et al., *supra* note 17.

[36] ENVTL. PROTECTION AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2013, 3-50 (2015) (this figure only includes direct methane emissions from coal mining).

[37] *Id.* at 3-70 – 3-71 (production emissions include 47.0 MMT CO_{2e} of CH_4 and 15.9 MMT CO_2).

[38] *Id.* at 3-57-3-58 (production emissions include 24.2 MMT CO_{2e} of CH_4 and 0.5 MMT CO_2).

Unfortunately, it is difficult to say exactly how much of a percentage direct emissions amount to, because as of early 2016 the Federal Government has not yet published any comprehensive assessment of life-cycle emissions from fossil fuels produced from federal lands. There are a variety of peer-reviewed studies and government reports that evaluate the life-cycle emissions associated with coal, oil and gas more generally.[39] These typically provide estimates of life-cycle emissions per unit of electricity generated, as well as details about how life-cycle emissions differ between fuel sources and which stages (production, processing, transport, etc.) are responsible for what proportion of total emissions.[40] But they do not examine the aggregate impacts of fossil fuels produced from federal lands.

DOI's recent announcement of its plans to conduct a programmatic review of environmental effects from federal coal leasing, which will include an evaluation of greenhouse gas emissions from coal production and consumption,[41] and to develop a "public database to account for the annual carbon emissions from fossil fuels developed on federal lands,"[42] should go a long way toward providing a more complete picture of how federal decisions about fossil fuel development can affect global climate change. But the federal government has not yet announced any plans to conduct a similar assessment of oil and gas extraction.

At the same time, there are several environmental groups that have prepared independent studies to evaluate the carbon footprint of federal leasing decisions. According to one study commissioned by the Wilderness Society, the combustion of fossil fuels extracted from federal lands and waters by private leaseholders in 2012 resulted in 1,344 million metric tons (MMT) of CO2e emissions.[43] This is equivalent to approximately 21% of total U.S. greenhouse gas emissions and 24% of energy-related emissions. The Center for Biological Diversity also conducted a separate

[39] See the Appendix for a complete list of such studies.

[40] *See, e.g.*, RICHARD K. LATTANZIO, CONG. RESEARCH SERV., LIFE-CYCLE GREENHOUSE GAS ASSESSMENT OF COAL AND NATURAL GAS IN THE POWER SECTOR (June 26, 2015).

[41] Order No. 3338, Discretionary Programmatic Environmental Statement to Modernize the Federal Coal Program (Dept. of Interior, Jan 15, 2016).

[42] DEPT. OF INTERIOR, FACT SHEET: MODERNIZING THE FEDERAL COAL PROGRAM 3 (Jan. 16, 2016).

[43] STRATUS CONSULTING, GREENHOUSE GAS EMISSIONS FROM FOSSIL ENERGY EXTRACTED FROM FEDERAL LANDS AND WATERS: AN UPDATE (Dec. 2015). *See also* CLAIRE MOSER ET AL., CENTER FOR AMERICAN PROGRESS AND THE WILDERNESS SOCIETY, CUTTING GREENHOUSE GAS FROM FOSSIL-FUEL EXTRACTION ON FEDERAL LANDS AND WATERS (March 2015) (discussing these results and policy implications).

study on the impact of allowing additional exploitation of fossil fuels on federal lands.[44] The study concluded that if *all* of the available fossil fuels (leased and unleased) were extracted and used, the lifecycle greenhouse gas emissions (including production, transport, processing and combustion) would be 492 gigatons (Gt) (492,000 MMT) of CO_{2e}. Fortunately, 91% of these fossil fuels (approximately 450 Gt CO_{2e}) have not yet been leased to private industry for extraction. Finally, Greenpeace published a 2014 study of the federal coal program which examined both the downstream greenhouse gas impacts and the corresponding social costs of those emissions.[45] The study concluded that the carbon pollution from publicly owned coal leased during the Obama administration will cause damages ranging from $52 billion to $530 billion, using the federal government's social cost of carbon estimates. In contrast, the total amount of revenue generated from those coal lease sales was $2.3 billion.

D. Greenhouse Gas Emissions from Transportation and Processing Infrastructure

As with extraction there are direct emissions associated with the construction and operation of pipelines, railways, export terminals, liquefaction facilities and other infrastructure used to process and transport fossil fuels. According to EPA's inventory, the transportation and processing of natural gas generated at least 180 MMT CO_{2e} in 2013,[46] whereas the transportation and processing of crude oil produced only 6.5 MMT CO_{2e} in 2013.[47] Notably, neither of these figures include emissions from the combustion of fossil fuels used to power natural gas processing facilities and crude oil refineries, because these figures were not specified in the inventory.

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[44] DUSTIN MULVANEY ET AL., CENTER FOR BIOLOGICAL DIVERSITY AND FRIENDS OF THE EARTH ,THE POTENTIAL GREENHOUSE GAS EMISSION OF U.S. FEDERAL FOSSIL FUELS (August 2015).

[45] GREENPEACE, LEASING COAL, FUELING CLIMATE CHANGE: HOW THE FEDERAL COAL LEASING PROGRAM UNDERMINES PRESIDENT OBAMA'S CLIMATE PLAN (2014).

[46] This figure includes CO_2 emissions and CH_4 emissions. This figure does not include any N_2O emissions (since this were not specified in the EPA inventory). Specific sources include: 47.7 MMT CO_{2e} (CO_2 emissions from natural gas powered pipelines transporting natural gas), 22.7 MMT CO_{2e} (CH_4 emissions from natural gas processing), 54.4 MMT CO_{2e} (CH_4 emissions from natural gas transmission and storage), 33.3 MMT CO_{2e} (CH_4 emissions from distribution), 21.8 MMT CO_{2e} (non-combustion CO_2 emissions from natural gas processing), 0.1 MMT CO_{2e} (non-combustion CO_2 emissions from natural gas transmission and storage). *See* ENVTL. PROTECTION AGENCY (2015), *supra* note 38 at 2-29, 3-70, 3-71.

[47] The sources of emissions include: 0.2 MMT CO_{2e} (CH_4 from crude oil transportation), 0.8 MMT CO_{2e} (CH_4 from crude oil refining), 5.5 MMT CO_{2e} (CO_2 from Crude Refining), 0.1 MMT CO_{2e} (CH_4 from industrial wastewater produced by petroleum refining). *Id.* at 3-58, 3-59, 7-17.

The construction of infrastructure intended to transport and process fossil fuels also affects fossil fuel prices, patterns of production and consumption, and the corresponding emissions that are generated as a result of increased (or prolonged) fossil fuel use. Although there are few studies on the incremental effect of pipelines and other transportation infrastructure on fossil fuel markets and consumption, the government has recently begun to evaluate these questions—primarily in the context of LNG export terminals.

In 2012, the U.S. Energy Information Administration (EIA) conducted a study to determine the effect of increased natural gas exports on domestic energy markets.[48] The study concluded that: (i) an increase in natural gas exports will lead to an increase in natural gas prices, (ii) 60-70% of the increase in natural gas exports will be met through an increase in domestic natural gas production, and the remaining 30-40% will be supplied by natural gas that would have been consumed domestically if not for higher prices, and (iii) as natural gas prices increase, the electric power sector will primarily shift to coal-fired generation. The study did not contemplate how these market shifts would affect emissions.

In 2014, DOE published an addendum to environmental review documents for LNG export facilities.[49] The addendum included an assessment of greenhouse gas emissions from the upstream natural gas industry, which examined how the increase in natural gas production associated with the increase in exports would affect various aspects of the environment. With respect to climate change the study concluded that each incremental increase in natural gas production of 1 trillion standard cubic feet (scf) per year will generate an additional 6.8 million metric tons of CO_{2e} per year.[50] This is roughly equivalent to the annual greenhouse gas emissions from 1.43 million passenger vehicles or electricity use in 935,000 homes.[51]

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[48] ENERGY INFO. ADMIN., EFFECT OF INCREASED NATURAL GAS EXPORTS ON DOMESTIC ENERGY MARKETS (Jan. 2012).

[49] DEPT. OF ENERGY, ADDENDUM TO ENVIRONMENTAL REVIEW DOCUMENTS CONCERNING EXPORTS OF NATURAL GAS FROM THE UNITED STATES (Aug. 2014).

[50] *Id.* at 44.

[51] *Greenhouse Gas Equivalencies Calculator*, ENVTL. PROTECTION AGENCY, http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator (last visited March 10, 2016). As an additional point of reference, the total export capacity of LNG export terminals that have already been approved by FERC is approximately 4.2 tcf/year, and the total capacity of proposed terminals is 10.9 tcf/year. *North American LNG Import/Export Terminals Approved as of January 6, 2016*, FED. ENERGY REGULATORY COMM'N, https://www.ferc.gov/industries/gas/indus-act/lng/lng-approved.pdf (last visited March 10, 2016); *North American LNG Export Terminals Proposed as of January 6, 2016*, FED. ENERGY REGULATORY COMM'N, http://www.ferc.gov/industries/gas/indus-act/lng/lng-proposed-export.pdf (last visited March 10, 2016).

That same year, DOE also conducted a comparative study of life-cycle greenhouse gas emissions from LNG exports to European and Asian markets, as compared with coal produced and consumed within those regions, and concluded that the use of U.S. LNG exports will not increase emissions *so long as the LNG replaces regional coal*.[52] Specifically, the study concluded that life-cycle greenhouse gas emissions would be 787 kg CO_{2e}/MWh for LNG exports to Europe, and 824 kg CO_{2e}/MWh for LNG exports to Asia (using a 20-year GWP). In contrast, the lifecycle emissions from burning coal in both regions would be 1,095 kg CO_{2e}/MWh.[53] The study does not evaluate how the life-cycle emissions from U.S. LNG exports compare with emissions of other fuel sources, nor does it include a market analysis to verify whether U.S. LNG exports would in fact replace coal. The agency's conclusion is thus based on an incomplete analysis of alternatives to LNG exports. That said, the life-cycle analysis could be used as a basis for future comparisons of LNG exports and alternatives (including renewables and energy efficiency).

II. THE NATIONAL ENVIRONMENTAL POLICY ACTION: STATUTE AND REGULATIONS

A. The National Environmental Policy Act

NEPA is a statute of famously broad environmental ambition.[54] It makes it a national policy to "create and maintain" a "productive harmony" between "man and nature" and to "fulfill" the obligations imposed by the principle of intergenerational equity, among other things.[55] The statute further requires the federal government—again, among other things—to "improve and coordinate" its activities in order to better serve as a "trustee of the environment;" to assure "safe, healthful, productive, and esthetically and culturally pleasing surroundings; to protect against "undesirable and unintended consequences;" and to preserve historic, cultural and natural resources.[56]

[52] DEPT. OF ENERGY, *LIFE CYCLE GREENHOUSE GAS PERSPECTIVE ON EXPORTING LIQUEFIED NATURAL GAS* (May 2014).
[53] *Id.* at 10.
[54] *See* citations, note 10, *supra*.
[55] NEPA § 101(a), 42 U.S.C. § 4331(a).
[56] NEPA § 101(b), 42 U.S.C. § 4331(b).

The process of environmental impact review is the mechanism through which the statute seeks to deliver on these goals. Section 102(2)(C) of NEPA requires all federal agencies to prepare a "detailed statement" on the environmental impacts of proposals for legislation and major federal actions significantly affecting the quality of the human environment.[57] This Environmental Impact Statement (EIS) must discuss: (i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.[58]

In addition to the core EIS requirements, there are other, less frequently discussed, requirements that are also relevant to an agency's decisions about how to handle fossil fuel-related plans and approvals. Section 102(2)(E) requires an alternatives analysis for "any proposal which involves unresolved conflicts concerning alternative uses of available resources."[59] And Section 102(2)(F) requires federal agencies to take a global view of environmental problems, and, "where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment."[60]

B. NEPA Regulations

The Council on Environmental Quality (CEQ) is tasked with issuing regulations to implement NEPA.[61] Each federal agency also develops its own NEPA procedures to supplement

[57] NEPA § 102(2)(C), 42 U.S.C. § 4332(2)(C).
[58] *Id.*
[59] NEPA § 102(2)(E), 42 U.S.C. § 4332(2)(E).
[60] NEPA § 102(2)(F), 42 U.S.C. § 4332(2)(F).
[61] CEQ's authority to issue regulations under NEPA is based on the duties and functions established for the Council by the statute, as well as two Executive Orders as well as the text of NEPA. *See* NEPA § 204(3), 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). Although the NEPA statute does not expressly state that CEQ shall develop implementing regulations, federal courts have consistently deferred to CEQ's interpretation of NEPA. *See, e.g.*, Robertson v. Methow Valley Citizens Council (1989) 490 U.S. 332, 355 (1989) (CEQ regulations are entitled to "substantial deference"); Andrus v. Sierra Club, 442 U.S. 347, 358 (1979) (same).

the CEQ regulations. As a result, NEPA procedures vary from agency to agency, though an agency's NEPA procedures must be consistent with the CEQ regulations.

The CEQ regulations define three types of environmental impacts (or "effects") that agencies must consider when conducting NEPA reviews: direct effects, indirect effects, and cumulative effects. Direct effects are "caused by the action and occur at the same time and place."[62] Indirect effects are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable."[63] Such effects may include "growth inducing 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."[64] Cumulative effects 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."[65] As discussed in Section IV, below, most federal courts have interpreted upstream and downstream emissions as indirect effects of fossil fuel extraction and transportation projects.

The CEQ regulations also specify that agencies "shall" consider three types of related actions when deciding on the scope of actions and impacts to evaluate in an EIS.[66] These include connected actions, which are "closely related and therefore should be discussed in the same impact statements;"[67] cumulative actions, which "have cumulatively significant impacts and should therefore be discussed in the same impact statement;"[68] and similar actions, which "have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography."[69] The regulations also note that an agency cannot break down an

[62] 40 C.F.R. § 1508.8(a).
[63] 40 C.F.R. § 1508.8(b)
[64] *Id.*
[65] 40 C.F.R. § 1508.7.
[66] 40 C.F.R. § 1508.25.
[67] 40 C.F.R. § 1508.25(a)(1). Connected actions include actions that "automatically trigger" other actions which may require EISs, actions that "cannot or will not proceed unless other actions are taken previously or simultaneously," and actions that are "interdependent parts of a larger action and depend on the larger action for their justification." *Id.*
[68] 40 C.F.R. § 1508.25(a)(2).
[69] 40 C.F.R. § 1508.25(a)(3).

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]

These categories intersect in a number of ways. First, there is some overlap between the requirement to consider the environmental effects of related actions together and the requirement to evaluate indirect environmental effects. For example, in the NEPA review of a proposed coal mining plan, the greenhouse gas emissions from transporting the coal could be treated as indirect emissions or as emissions from a "connected action," at least where the transportation requires federal approval. Second, the regulations specify that connected and cumulative actions "should" be discussed in the same EIS, and the courts have interpreted these as enforceable requirements. However, for similar actions, the regulations state that agencies "may wish to evaluate these in the same impact statement" and "should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternative to such actions is to treat them in a single impact statement."[71] Due to the permissive language in this section, courts have granted considerable deference to agency decisions about whether to prepare a single EIS for similar actions.

Of course, sometimes there is just not adequate information about these various types of potentially interconnected activities to meaningfully analyze them together. The CEQ regulations expressly discuss 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.[72] If an agency cannot obtain the missing information due to exorbitant costs or infeasibility, it must include the following items in the EIS: (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

[70] 40 C.F.R. § 1508.27(7).
[71] 40 C.F.R. § 1508.25(a)(3).
[72] 40 C.F.R. § 1502.22(a).

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.[73]

C. Agency Guidance

The CEQ issued draft guidance on climate change and NEPA reviews in 2010, and revised draft guidance in 2014.[74] The original guidance document noted that agencies should consider both direct and indirect greenhouse gas emissions, and that the analysis of indirect effects "must be bounded by limits of feasibility in evaluating upstream and downstream effects of Federal agency actions,"[75] but did not go into detail about the scope of indirect emissions that should be considered for specific types of projects.[76] The 2014 revised draft guidance provides additional insight on this question, specifying that agencies should account for greenhouse gas emissions from the proposed action *and any connected actions*, "subject to reasonable limits based on feasibility and practicality."[77] The analysis should include "emissions from activities that have a reasonably close causal relationship to the Federal action, such as those that may occur as a predicate for agency action (often referred to as upstream emissions) and as a consequence of the agency action (often referred to as downstream emissions)."[78] To illustrate this point, the guidance notes that the NEPA analysis for a proposed open pit mine could include emissions from "clearing land for the extraction, building access roads, transporting the extracted resource, refining or processing the resource, and using the resource."[79] The revised draft guidance further notes that a programmatic

[73] 40 C.F.R. § 1502.22(b).
[74] Revised Draft Guidance (2014), 79 Fed. Reg. at 77,826.
[75] COUNCIL ON ENVTL. QUALITY, DRAFT NEPA GUIDANCE ON CONSIDERATION OF THE EFFECTS OF CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS 3 (Feb. 19, 2010).
[76] It is also worth noting that the 2010 guidance did not apply to federal "land and resource management actions"—particularly those that entailed changes in land use or land management strategies—because there was no established federal protocol for assessing their effect on carbon release and sequestration at a landscape scale. Although decisions involving fossil fuels could qualify as "resource management actions," the guidance specifically cited coal mining authorizations as one type of project that would be covered by the recommendations for greenhouse gas reporting. *Id.* at 2. Whether the original guidance applied to the management of fossil fuels is now a moot question, since the 2014 revised draft guidance explicitly applies to such actions.
[77] Revised Draft Guidance (2014), 79 Fed. Reg. at 77,825 - 77,826.
[78] *Id.* at 77,826.
[79] *Id*.

assessment of emissions may be helpful in the context of long-range energy, transportation, and resource management actions.[80]

There are other guidance documents which also provide some insight on the scope of greenhouse gas emissions that should be evaluated in NEPA documents for fossil fuel extraction and transportation infrastructure approvals. Although CEQ has not issued a standalone guidance document for indirect effects analysis,[81] the agency did publish a list of *Questions and Answers About the NEPA Regulations* that discusses how uncertainties about indirect effects should be addressed:

> The EIS must identify all the indirect effects that are known, and make a good faith effort to explain the effects that are not known but are "reasonably foreseeable." (40 CFR §1508.8(b)). In the example, if there is total uncertainty about the identity of future land owners or the nature of future land uses, then of course, the agency is not required to engage in speculation or contemplation about their future plans. But, in the ordinary course of business, people do make judgments based upon reasonably foreseeable occurrences. It will often be possible to consider the likely purchasers and the development trends in that area or similar areas in recent years; or the likelihood that the land will be used for an energy project, shopping center, subdivision, farm or factory. The agency has the responsibility to make an informed judgment, and to estimate future impacts on that basis, especially if trends are ascertainable or potential purchasers have made themselves known. The agency cannot ignore these uncertain, but probable, effects of its decisions.[82]

Notably, the "growth inducing effects" described in this example would be more difficult to forecast than, for example, downstream greenhouse gas emissions from the combustion of fossil fuels. There is considerable uncertainty about future land uses and development trends, whereas there is a good deal of certainty about the eventual fate of coal, oil and gas—the vast majority of these resources are combusted, and agencies can use available data on CO_2 emission factors for various combustion technologies to provide a reasonable estimate of combustion emissions.

[80] *Id.* at 77,830.

[81] CEQ did publish guidance on cumulative effects analysis, which clarifies that the appropriate area for the analysis of cumulative impacts should encompass any resources that could be affected by the proposed action. For the evaluation of air quality impacts, the guidance notes that the appropriate geographic area for analysis could be the global atmosphere (presumably if greenhouse gas emissions are released in a meaningful quantity). The guidance does not, however, discuss the proper zone of analysis for indirect impacts. COUNCIL ON ENVTL. QUALITY, GUIDANCE ON CUMULATIVE EFFECTS 15 (1997).

[82] *Forty Most Asked Questions Concerning CEQ's NEPA Regulations,* 46 Fed. Reg. 18026 (Council on Envtl. Quality, March 23, 1981) *(response to Question 18).*

Other agencies have also issued guidance on the meaning of "indirect effects" and what is "reasonably foreseeable."[83] BLM's NEPA Guidebook provides some examples of indirect effects. For example, in a proposal for a right-of-way request from a private company to build a road across BLM-managed land to provide access to a privately owned and operated quarry, the construction and operation of which cannot proceed unless the road is constructed, the agency should evaluate the construction and operation of the quarry as indirect effects of the proposed action.[84] The guidebook further notes that, where there is no causal link between the BLM decision and the non-federal action (construction and operation of the quarry), the effects may still need to be analyzed in the cumulative impacts analysis.[85]

The BLM guidebook also discusses the concept of "related actions" including connected, cumulative and similar actions. It notes that related actions that are not subject to NEPA approval may nonetheless need to be considered in the indirect and/or cumulative effects analysis.[86] It also notes that joint reviews should be conducted for certain types of related actions even if they are undertaken by separate agencies—for example, BLM's decision to construct a trail to provide recreational access to a USFS campground should be evaluated as aspects of a broader proposal, and a joint NEPA review can be conducted by both BLM and USFS.[87]

III. AN AGENCY-BY-AGENCY LOOK AT THE SCOPE OF EXISTING FEDERAL ANALYSIS OF UPSTREAM AND DOWNSTREAM GREENHOUSE GAS EMISSIONS UNDER NEPA

Surveys of federal EISs from 2009 – 2014 conducted by the authors and others at the Sabin Center for Climate Change Law and Columbia Law School reveal that some federal agencies are

[83] In addition to the BLM handbook, *see Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process*, FED. HIGHWAY ADMIN., https://www.environment.fhwa.dot.gov/projdev/qaimpact.asp (last visited March 10, 2016) (indirect impacts are a "subset of cumulative impacts" but are "distinguished by an established cause and effect relationship" to the proposed federal action, and that such events must be "probable" and not merely "possible" in order to be considered reasonably foreseeable).
[84] BUREAU OF LAND MGMT., NEPA HANDBOOK 46-47 (2008).
[85] *Id.* at 47.
[86] *Id.* at 45-47.
[87] *Id.* at 45.

beginning to account for upstream and/or downstream emissions in NEPA reviews for fossil fuel-related proposals, in part due to public pressure and judicial intervention.[88] Others have maintained that such an analysis is not required, because these emissions do not fall within the scope of indirect effects that must be analyzed in NEPA reviews. This section provides a brief overview of how different federal agencies have interpreted and implemented their NEPA obligations in this context.

A. Bureau of Land Management

BLM frequently acts as the lead agency for NEPA reviews of oil, gas and coal land allocations, mining plans and lease approvals. Yet, BLM has not yet developed a consistent methodology for analyzing downstream emissions in these EISs. Prior to 2010, the agency maintained that downstream emissions—particularly from combustion—need not be evaluated because they will occur regardless of whether the proposed action is implemented.[89] More recently, BLM has begun to disclose downstream emissions from the combustion of fossil fuels in some EISs. In a 2010 EIS for several coal lease applications, BLM quantified emissions from combustion (which totaled 4,040.5 million tons CO_{2e}),[90] but concluded that these emissions probably would not differ under the proposed action and the no action alternative because there were other sources of coal that could be substituted for this source.[91]

[88] Wentz et al. (2016), *supra* note 17; Delach et al. (2013), *supra* note 17; Woolsey et al. (2012), *supra* note 17.

[89] See, e.g., BUREAU OF LAND MGMT., FINAL ENVIRONMENTAL IMPACT STATEMENT, FLAT CANYON FEDERAL COAL LEASE TRACT, UTU-77114, 2-11 (Jan. 2002) ("If Flat Canyon Tract coal is not mined and burned, coal from other sources with higher potential for producing pollutants would most likely be purchased and burned in these or other plants. The issues of climate changes and global warming from combustion of fossil fuels are considered beyond the scope of this analysis."); BUREAU OF LAND MGMT., FINAL LAND USE ANALYSIS AND FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE EAST LYNN LAKE COAL LEASE, EIS-ES-030-2008-0004, 266 (March 2009) ("The use of coal as a national energy source would generate GHG emissions, however the location, combustion efficiency, and amount of GHG emissions potentially generated is beyond the scope of this analysis. Since the Proposed Action would simply extend the life of the Applicants' existing, adjoining operations, it is unlikely total GHG emission would change substantially. The No Action alternative could lower direct GHG emissions from mine transportation and processing equipment minimally, it is likely alternative sources would maintain the use of coal at national levels.").

[90] BUREAU OF LAND MGMT., FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE WRIGHT AREA COAL LEASE APPLICATIONS, 4-140 (July 2010).

[91] *Id.* at 4-141.

BLM has taken a different approach in some of its more recent EISs for coal, oil and gas development.[92] Notably, in a 2015 EIS for a coal lease, BLM expressly acknowledged that "the burning of the coal is an indirect impact that is a reasonable progression of the mining activity"[93] and quantified emissions from combustion without any disclaimer about other sources of coal.[94] In that same EIS, BLM also acknowledged that truck traffic to haul coal would be extended as a result of the proposed lease approval, and this would generate additional emissions (but it did not quantify these emissions).[95] However, BLM's approach to its assessment of downstream emissions remains inconsistent. For example, in two 2015 EISs for oil and gas development, BLM did not even mention let alone quantify emissions from combustion or transportation of the extracted fuels, nor did it explain why those emissions were omitted from the inventory.[96]

B. United States Forest Service

USFS frequently acts as the lead agency in NEPA reviews for oil, gas, and coal projects on federal forest land. Like BLM, USFS did not initially evaluate downstream greenhouse gas emissions but is now beginning to quantify and disclose these emissions in EISs. But the agency's approach has also been somewhat inconsistent. In a 2012 EIS for two federal coal lease modifications, the agency disclosed CO_2 emissions from the combustion of the coal that was anticipated to be produced under the leases.[97] However, that same year, USFS released an EIS for a rule that would open federal forests to coal mining which did not disclose combustion-related

[92] See, e.g., BUREAU OF LAND MGMT., ALTON COAL TRACT LEASE BY APPLICATION, DRAFT ENVIRONMENTAL STATEMENT, DES-11-51, 4-31, 4-32 (Nov. 2011) (quantifying greenhouse gas emissions from combustion without any disclaimer about these emissions being offset by other sources of coal); BUREAU OF LAND MGMT., ALTON COAL TRACT LEASE BY APPLICATION, SUPPLEMENTAL DRAFT EIS, DOI-BLM-UT-C040-2015-0011-EIS, 4-74 (June 2015) (also quantifying emissions without a disclaimer about other sources of coal); BUREAU OF LAND MGMT., PREVIOUSLY ISSUED OIL AND GAS LEASES IN THE WHITE RIVER NATIONAL FOREST, DRAFT ENVIRONMENTAL IMPACT STATEMENT, BLM/CO/PL-16/002, 4.2-48, 4.2-59 (Nov. 2015) (total emissions estimates include assumed end-use energy consumption CO_2 emissions).

[93] BUREAU OF LAND MGMT., FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE LEASING AND UNDERGROUND MINING OF THE GREENS HOLLOW FEDERAL COAL LEASE TRACT, UTU-84102, 287 (Feb. 2015).

[94] *Id.* at 286.

[95] *Id.* at 287.

[96] BUREAU OF LAND MGMT., DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE BULL MOUNTAIN UNIT MASTER DEVELOPMENT PLAN, DOI-BLM-CO-S050-2013-0022-EIS (Jan. 2015); BUREAU OF LAND MGMT., PROPOSED RESOURCE MANAGEMENT PLAN AMENDMENT AND FINAL ENVIRONMENTAL IMPACT STATEMENT FOR OIL AND GAS DEVELOPMENT (March 2015).

[97] U.S. FOREST SERV., FINAL ENVIRONMENTAL IMPACT STATEMENT, FEDERAL COAL LEASE MODIFICATIONS COC-1362 & COC-67232, 80 (Aug. 2012).

emissions.[98] The Colorado District Court held that this omission was arbitrary and capricious,[99] and USFS prepared a revised draft EIS that included a much more detailed analysis of greenhouse gas emissions from mining, transportation (both within the U.S. and to overseas markets) and combustion.[100]

As with BLM, the agency's approach to evaluating downstream emissions from oil and gas development remains inconsistent. USFS conducted a life cycle assessment for an oil and gas leasing decision in 2013, which quantified emissions from transport, refining, and end-use.[101] But in 2014, the agency released an EIS for another oil and gas leasing decision where it concluded that it was *impossible* to quantify downstream emissions from oil and gas development because the end uses of these resources were unknown.[102] In another oil and gas EIS released that same year, USFS did not disclose greenhouse gas emissions for very different reasons—the agency noted that the "end use of natural gas for heating and electricity would also contribute to GHG emissions" but concluded that the potential development of oil and gas resources is "not expected to produce a measurable or significant impact" and that the "demand for this energy source would likely result in its development elsewhere."[103]

[98] U.S. FOREST SERV., RULEMAKING FOR COLORADO ROADLESS AREAS, FINAL ENVIRONMENTAL IMPACT STATEMENT (May 2012).
[99] High Country Conservation Advocates v. United States Forest Serv., 52 F. Supp. 3d 1174, 1196 (D. Colo. 2014).
[100] U.S. FOREST SERV., RULEMAKING FOR COLORADO ROADLESS AREAS, SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT (Nov. 2015) at 33.
[101] U.S. FOREST SERV., RECORD OF DECISION AND FINAL ENVIRONMENTAL IMPACT STATEMENT, OIL AND GAS LEASING ANALYSIS, FISHLAKE NATIONAL FOREST 169 (Aug. 2013) (Table 3.12-7: GHG emissions from transportation, offsite refining and end use are 299,627 MT CO2e; total direct and indirect emissions are 365,336 MT CO2e). *See also id.*, Appendix E/SIR-2 (more detailed calculations of direct and indirect emissions).
[102] U.S. FOREST SERV., PAWNEE NATIONAL GRASSLAND OIL AND GAS LEASING ANALYSIS, FINAL ENVIRONMENTAL IMPACT STATEMENT 188 (Dec. 2014) ("The numbers provided … do not include greenhouse gas emissions that would result from processing the extracted oil and gas into final products or from the end use of those products. This is because it is not possible to determine what the volume or quality of extracted oil and gas will be or which types of products will ultimately be derived from the oil and gas. It is also not possible to forecast where, how, or when products extracted from the project area will be used. Oil, for example, can be used to produce many types of products, including diesel fuel, gasoline, aircraft fuel, kerosene, motor oils, plastics, solvents, lubricants, tires, asphalt, and a myriad of other possible end products. Natural gas could be used for electrical generation, home heating, home cooking, as a vehicle fuel, in fertilizer production (via the Haber–Bosch process), and for other uses.").
[103] U.S. FOREST SERV., WHITE RIVER NATIONAL FOREST OIL AND GAS LEASING, FINAL ENVIRONMENTAL IMPACT STATEMENT 132 (Dec. 2014).

C. Federal Energy Regulatory Commission

FERC is the lead agency on environmental reviews of pipelines, LNG export facilities, and associated infrastructure (e.g., compressor stations and liquefaction facilities). Recently, FERC has been criticized for perceived bias in the review and approval of these projects. As noted in a recent lawsuit, FERC's natural gas program budget is funded by fees imposed on the very companies it regulates, and perhaps because of this, FERC approved all of the pipeline applications it received during a thirty-year period and never once concluded in an EA that a project would have significant environmental impacts.[104] FERC's financial interest in approving these projects may also influence its decisions about when and how to account for greenhouse gas emissions when deciding whether to approve a project.

Unlike BLM and USFS, FERC has consistently maintained that it has no obligation to consider greenhouse emissions or any other environmental effects associated with upstream and downstream activities in the natural gas production and supply chain. FERC's primary arguments against evaluating these as indirect (or even cumulative) impacts are that such emissions are: (i) too speculative to be analyzed in a meaningful way, or (ii) not caused by the proposed action.[105] FERC has also insisted on conducting separate environmental reviews for different segments of natural gas pipelines, and for multiple facilities with very similar characteristics (e.g., LNG export terminals).

This has led to a series of lawsuits alleging that FERC is in violation of NEPA. Since 2014, the Sierra Club and other environmental organizations have challenged five separate FERC orders in the D.C. Circuit, citing the agency's failure to evaluate upstream and downstream impacts and

[104] Complaint for Declaratory and Injunctive Relief, *Delaware Riverkeeper Network v. Fed. Energy Regulatory Comm'n,* No. 16-416 (D.D.C. 2016) (also noting that, in the past thirty years, FERC has "never granted a rehearing request to a non-industry party; the Commission has adopted biased policy objectives in favor of pipeline companies; and the Commission has left unfunded a Congressionally authorized Office designed to assist non-industry parties in participating in the Commission's administrative process").

[105] See, e.g., Order Denying Rehearing, Cameron LNG, LLC Cameron Interstate Pipeline, LLC, 148 FERC ¶ 61,237, 62,448-49 (Sept. 26, 2014); Order Denying Rehearing and Clarification, Freeport LNG Dev., L.P. FLNG Liquefaction, LLC, 149 FERC ¶ 61,119, 61,776 (Nov. 3, 2014); Order Denying Rehearing and Stay, Dominion Cove Point LNG, 151 FERC ¶ 61,095, 61,635-36 (May 4, 2015); Order Denying Rehearing, Corpus Christi Liquefaction, LLC Cheniere Corpus Christi Pipeline, L.P., 151 FERC ¶ 61,098, 61,651-54 (May 6, 2015); Order Denying Rehearing, Sabine Pass Liquefaction Expansion, LLC Sabine Pass LNG L.P., Cheniere Creole Trail Pipeline, L.P., 151 FERC ¶ 61,253, 62,671-73 (June 23, 2015).

other deficiencies with the NEPA analysis. One of these cases was voluntarily dismissed.[106] The others are still awaiting decisions from the D.C. Circuit Court of Appeals.[107]

Notably, despite its insistence that upstream and downstream effects need not be evaluated in NEPA reviews, FERC does briefly discuss the *beneficial* implications of these effects in some EISs, noting that some of the natural gas projects could offset the use of oil and this will reduce greenhouse gas emissions. But the agency does not provide a complete analysis of downstream emissions or market impacts to actually support this conclusion.[108]

D. Bureau of Ocean and Energy Management

The Bureau of Ocean and Energy Management (BOEM) conducts NEPA reviews for offshore oil and gas drilling plans and leases. BOEM does not account for downstream greenhouse gas emissions associated with the transportation, processing and end use of the oil and gas produced as a result of its decisions.[109] In response to comments calling for the consideration of downstream emissions, BOEM has asserted that such emissions are "too remote and speculative to permit any meaningful analysis."[110]

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[106] Sierra Club and Gulf Restoration Network v. FERC, No. 14-1190 (D.C. Cir. Mar. 16, 2015).

[107] Sierra Club v. FERC, No. 15-1133 (D.C. Cir. filed May 11, 2015); Sierra Club and Galveston Baykeeper v. FERC, No. 14-1275 (D.C. Cir. filed Dec. 10, 2014); Sierra Club v. FERC, No. 14-1249 (D.C. Cir. filed Nov. 17, 2014); Earthreports, Inc., Sierra Club, and Chesapeake Climate Action Network v. FERC, No. 15-1127 (D.C. Cir. filed May 7, 2015).

[108] *See, e.g.,* FED. ENERGY REGULATORY COMM'N, ROCKAWAY DELIVERY LATERAL AND NORTHEAST CONNECTOR PROJECTS FINAL ENVIRONMENTAL IMPACT STATEMENT 4-215—217 (2014) (predicting that pipeline will lead to decrease in fuel oil use, displacing 11,357 MT CO2eq daily); FED. ENERGY REGULATORY COMM'N, CONSTITUTION PIPELINE PROJECT AND WRIGHT INTERCONNECT PROJECT FINAL ENVIRONMENTAL IMPACT STATEMENT 4-256 (2014) at 4-256 (anticipates some displacement of greenhouse gases from burning fuel oil).

[109] *See, e.g.,* BUREAU OF OCEAN & ENERGY MGMT., GULF OF MEXICO OCS OIL AND GAS LEASE SALES: 2016 AND 2017, FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (Sept. 2015); BUREAU OF OCEAN & ENERGY MGMT., GULF OF MEXICO OCS OIL AND GAS LEASE SALES: 2015 AND 2016, FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (March 2015); BUREAU OF OCEAN & ENERGY MGMT., ATLANTIC OCS PROPOSED GEOLOGICAL AND GEOPHYSICAL ACTIVITIES, MID-ATLANTIC AND SOUTH ATLANTIC PLANNING AREAS, FINAL PROGRAMMATIC ENVIRONMENTAL STATEMENT L-172 (Feb. 2014) (BOEM received a comment calling for consideration of downstream emissions as well as other climate-related effects, but did not specifically respond to this aspect of the comment, merely stating that it did "not believe that an analysis beyond that provided is necessary"); BUREAU OF OCEAN & ENERGY MGMT., OUTER CONTINENTAL SHELF OIL AND GAS LEASING PROGRAM: 2012-2017, FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (July 2012).

[110] BUREAU OF OCEAN & ENERGY MGMT., OUTER CONTINENTAL SHELF OIL AND GAS LEASING PROGRAM: 2012-2017, FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT 8-37 (July 2012).

E. Department of Energy

DOE approval is required prior to the export of LNG from U.S. terminals to non-free trade agreement nations. But the agency does not typically prepare a separate EA or EIS for these approvals, since FERC has already conducted a NEPA review for the export terminal. It is worth noting, however, that unlike FERC, DOE has begun to account for both upstream and downstream greenhouse gas emissions in the orders granting authorization to export LNG.[111] To support this analysis, DOE conducted the two LNG studies discussed in Section I, supra, which estimate greenhouse emissions from all aspects of the LNG supply chain: production, processing, transportation and end use.[112]

F. United States Army Corps of Engineers

The Corps will act as the lead agency for NEPA reviews of projects that involve Corps authorizations (e.g., projects that involve the discharge of dredged and/or fill materials into waters of the U.S., including wetlands). Such projects may include oil and gas pipelines, coal export terminals, and any other projects where one of the aforementioned agencies is not already conducting a NEPA review.

The Corps is not permitted to reject a permit based on emissions of greenhouse gas emissions, but as lead agency for some projects it is nonetheless in the position to ensure an adequate analysis of them. Based on two recent environmental reviews for fossil fuel-related projects, the Corps also appears to lack a consistent approach for analyzing upstream and downstream emissions. In 2012, the Corps published an EIS for an intrastate natural gas pipeline in Alaska (not subject to FERC jurisdiction). There, the agency estimated downstream emissions from combustion of the natural gas that would be transported, and also discussed the potential for

[111] *See, e.g.,* DEPT. OF ENERGY, OFFICE OF FOSSIL ENERGY, FREEPORT LNG EXPANSION, L.P., FLNG LIQUEFACTION LLC, FE DOCKET NO. 10-161-LNG, FINAL OPINION AND ORDER GRANTING LONG-TERM MULTI-CONTRACT AUTHORIZATION TO EXPORT LIQUEFIED NATURAL GAS BY VESSEL FROM THE FREEPORT LNG TERMINAL ON QUINTANA ISLAND, TEXAS, TO NON-FREE TRADE AGREEMENT NATIONS 43, 45-54 (Nov. 14, 2014).

[112] DEPT. OF ENERGY, ADDENDUM TO ENVIRONMENTAL REVIEW DOCUMENTS CONCERNING EXPORTS OF NATURAL GAS FROM THE UNITED STATES (Aug. 2014); *DEPT. OF ENERGY, LIFE CYCLE GREENHOUSE GAS PERSPECTIVE ON EXPORTING LIQUEFIED NATURAL GAS* (May 29, 2014).

natural gas to displace other, dirtier fuel sources such as coal and oil.[113] But in the NEPA scoping documents for a coal terminal in Washington State, the Corps has asserted that it need not consider upstream or downstream impacts (including greenhouse gas emissions), despite multiple comments calling for consideration of such impacts, because they are not within the agency's jurisdiction.[114] The Washington State Department of Ecology is also preparing an EIS for this project under its State Environmental Protection Act (SEPA), and it does intend to account for downstream emissions.[115]

G. Department of State

The Department of State does not typically conduct NEPA reviews for fossil fuel extraction and infrastructure. But it did act as lead agency on the Keystone XL Pipeline Review (because this pipeline crossed the U.S. border into Canada).[116] For this project, the Department of State conducted a relatively comprehensive life-cycle greenhouse gas analysis for the proposed pipeline, alternatives, and baseline scenarios that could occur if the pipeline was not constructed (all of which were possible outcomes of the no action alternative). This analysis included greenhouse gas emissions from production, processing, transportation and end-use.[117] It also conducted a market analysis to determine whether the pipeline would significantly affect the rate of oil extraction or

[113] U.S. ARMY CORPS OF ENG'RS, FINAL ENVIRONMENTAL IMPACT STATEMENT, ALASKA STAND ALONE GAS PIPELINE 5.20-70–71 (Oct. 2012).

[114] U.S. ARMY CORPS OF ENG'RS, SCOPING SUMMARY REPORT, PROPOSED GATEWAY PACIFIC TERMINAL/CUSTER SPUR 7-17 (Mar. 2013) ("According to the Applicants, the extraction, long-range transport, and combustion of coal, including overseas activities, would lack a causal project relationship because the Corps does not have jurisdiction over these activities. Moreover, these activities, such as rail or mining operation, have previously been scrutinized and are already in business. Therefore, conducting an area-wide EIS in this situation would be unprecedented and require that all commodities shipped on the transportation network be studied for lifecycle impacts during an EIS for each new project.") Given that the Corps has more limited discretion when issuing Section 404 permits (it evaluates impacts on water resources, but not air quality), the agency has a more sound legal basis for making the jurisdictional argument than FERC, BLM or any other agency with broad discretion to deny an application based on the public interest. But the agency's statement about the need to conduct a life-cycle analysis of *all* commodities is factually incorrect. There are readily available tools that can be used to calculate life cycle greenhouse gas emissions from coal and which would make this analysis reasonably easy for the agency, many of which are listed in the Appendix. The life-cycle greenhouse gas emissions are therefore reasonably foreseeable, even if this is not true for all environmental impacts from all commodities shipped via the terminal.

[115] WASHINGTON STATE DEPT. OF ECOLOGY, FAQ ON SCOPE OF EIS STUDIES FOR GATEWAY PACIFIC TERMINAL / CUSTER SPUR (Feb. 2014), *available at* http://www.ecy.wa.gov/geographic/gatewaypacific/gpt-faq.pdf.

[116] *See* Exec. Order 13337, 3 C.F.R. 13337 (2004).

[117] U.S. DEPT. OF STATE, FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE KEYSTONE XL PROJECT § 4.14.3, Appendix U (Jan. 2014).

use as compared with the baseline scenarios ("reference crudes").[118] The department ultimately concluded that the pipeline would not have a significant impact on greenhouse gas emissions, because it was unlikely to significantly affect the rate of oil extraction and consumption as compared with baseline scenarios,[119] but this conclusion was challenged by the Environmental Protection Agency, which noted that FERC had failed to account for decreased oil prices in the market analysis.[120] EPA also noted that the finding of no significant impact in this context was not supported by the agency's analysis, which revealed that the development of oil stands crude would, in fact, significantly increase greenhouse gas emissions as compared with the reference crudes.[121] Rather than preparing a revised EIS, the State Department ultimately decided to terminate the project, citing environmental concerns including climate change impacts.[122]

H. Environmental Protection Agency

The Environmental Protection Agency (EPA) does not prepare EISs for fossil fuel-related projects, but it does provide comments on EISs prepared by other agencies. EPA has a unique role in the commenting process—Section 309 of the Clean Air Act directs EPA to review and comment on the adequacy of the environmental impact analysis in a draft EIS, and to refer the matter to the Council on Environmental Quality in the event that the agency does not adequately respond to those comments in the final EIS.[123]

EPA has consistently urged agencies to consider upstream and downstream emissions in the EISs for fossil fuel-related projects. In particular, EPA has repeatedly commented on FERC EISs for pipelines and LNG export facilities, pressing for: (i) the consideration of how such infrastructure may affect upstream natural gas development and (ii) a life cycle greenhouse gas emissions analysis (and urging the agency to consider the DOE analysis of indirect greenhouse gas effects from LNG export facilities).[124] EPA also submitted comments on the scope of impacts that

[118] *Id.* at § 1.4.
[119] *Id.* at ES-9.
[120] Letter from Cynthia Giles, US EPA, to Amos Hochstein and Judith Garber, Department of State (Feb. 2, 2015).
[121] *Id.*
[122] Press Statement, John Kerry, Secretary of State, Keystone XL Pipeline Permit Determination (Nov. 6, 2015).
[123] Clean Air Act § 309, 42 U.S.C. § 7609.
[124] *See, e.g.*, Letter from Keith Hayden, Envtl. Protection Agency, to Kimberly D. Bose, Fed. Energy Reg. Comm'n (Dec. 21, 2015) (commenting on the Magnolia LNG and Kinder Morgan Louisiana Pipeline projects); Letter from Keith Hayden,

should be evaluated in the coal terminal EIS that the Corps is preparing, in which it urged the Corps to conduct a life cycle assessment of greenhouse gas emissions from the coal that would be transported via the terminal.[125]

IV. EMERGING TRENDS IN NEPA CASE LAW

In the past five years, over a dozen lawsuits have been filed challenging the approval of fossil fuel extraction and infrastructure proposals because the lead agency failed to consider upstream and/or downstream greenhouse gas emissions during its NEPA review. This section surveys and synthesizes this emerging body of case law, addressing judicial review of agency assessments of indirect effects and related actions for both extraction and transportation actions.[126]

In regards to indirect effects: For extraction proposals, courts have consistently held that downstream emissions fall within the scope of indirect impacts that should be reviewed under NEPA and that emissions from combustion are "reasonably foreseeable" when production estimates are available.[127] Emissions from transportation and processing may also fall within the scope of indirect impacts that are caused by the extraction of the resource, but the extent to which these emissions are "reasonably foreseeable" depends on the information available to the agency. The case law is less clear on the agency's obligation to evaluate upstream and downstream emissions in the context of transportation proposals such as pipelines and export terminals. Here, courts have, without much explanation, treated oil and gas pipelines differently than coal rail

Envtl. Protection Agency, to Kimberly D. Bose, Fed. Energy Reg. Comm'n (Sept. 21, 2015) (commenting on the Lake Charles Liquefaction Project); Letter from Craig Weeks, Envtl. Protection Agency, to Kimberly D. Bose, Fed. Energy Reg. Comm'n (Aug. 4, 2014) (commenting on the Corpus Christi Liquefaction and Pipeline projects).

[125] Letter from Deniss J. McLerran, Envtl. Protection Agency, to Randel Perry, U.S. Army Corps of Eng'rs (Jan. 22, 2013) (commenting on the Gateway Pacific Terminal project).

[126] It bears noting that NEPA decisions are highly fact-specific. The extent to which an agency is required to evaluate a particular environmental impact under NEPA depends on the information that is available to the agency and on the record. Thus, even if a court holds that an impact is too speculative to require consideration in the context of a particular project, a subsequent court may conclude that the same impact is reasonably foreseeable for a similar project if new information is available to facilitate the analysis of that impact. There are now many tools available to forecast greenhouse gas emissions from all stages of fossil fuel development, and thus courts may reach different conclusions about the scope of analysis required for the types of proposals discussed in the cases below. *See* Appendix.

[127] Although courts have required consideration of combustion emissions in NEPA reviews for coal extraction and transportation, they have also deferred to agencies' decisions to only evaluate the net increase in coal consumption (and corresponding emissions) caused by the additional production of coal. *See infra*, section IV(B)(1).

lines.[128] Whereas several courts have required consideration of upstream and downstream emissions in the context of coal rail line approvals, using the same principles as those applied in extraction cases, the courts have not yet required a similar analysis in the context of oil and gas pipelines.

In regards to related actions: There are very few decisions regarding the scope of an agency's obligation to evaluate connected, cumulative or similar fossil fuel-related proposals in the same EIS.[129] However, there are principles from cases involving other types of projects that can also be used to understand the circumstances in which agencies should conduct a programmatic review of interconnected fossil fuel infrastructure.

A. Standard of Review

Section 706 of the Administrative Procedure Act (APA) directs federal courts to find unlawful and set aside agency actions, findings and conclusions that are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law."[130] Applying this standard, reviewing courts must ensure that the agency has "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action" and that there is a "rational connection between the facts found and the choice made."[131] The agency's action should be overturned if the agency has "relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise."[132]

In the context of NEPA documents, the reviewing court must ensure that the agency has taken a "hard look" at the environmental consequences of the proposed action and reasonable

[128] This issue is currently being litigated—as of early 2016, there are four cases pending before the D.C. Circuit regarding the scope of upstream and downstream emissions that FERC must evaluate in its approval of natural gas pipelines and export facilities. *See infra*, section IV(B)(3).
[129] As discussed below, there is one recent case requiring FERC to conduct a joint review of different pipeline segments, and a much older case holding that a programmatic review of federal coal leasing was *not* required (but this was before agencies were contemplating greenhouse gas emissions and climate change in EISs). *See infra*, section IV(C).
[130] 5 U.S.C.A. § 706(2)(A).
[131] Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983).
[132] *Id.*

alternatives.[133] When conducting this inquiry, courts will refer to the four factors noted above—typically focusing on whether the agency failed to consider an important aspect of the problem, or offered an explanation for its decision that runs counter to the evidence before the agency.[134] Courts will frequently set aside EISs where an agency has completely ignored an environmental impact—if the agency has conducted at least *some* analysis, the court is more likely to defer to its findings about the nature and significance of the impact.[135] That said, a court will not defer to agency conclusions that are not supported by the evidence on the record.[136]

Courts will also consider whether the environmental disclosures requested by plaintiffs would help serve the twin purposes of NEPA: informed decision-making and informed public participation.[137] To answer this question, courts will apply the "rule of reason," which requires agencies to evaluate and disclose only that information which is useful to the decision-making process (e.g., because it will enable the decision-maker to fully consider environmental factors and make a reasoned choice among alternatives).[138] If an EIS is missing information that is highly relevant to the question of whether the agency should implement the action, and the agency has

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[133] Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989); Marsh v. Oregon Nat. Res. Council, 490 U.S. 360, 374 (1989); Kleppe v. Sierra Club, 427 U.S. 390, 410, n. 21 (1976).

[134] *See, e.g.*, Dubois v. U.S. Dep't of Agric., 102 F.3d 1273, 1285 (1st Cir. 1996); Sierra Club v. U.S. Army Corps of Engineers, 772 F.2d 1043, 1051 (2d Cir. 1985); Hughes River Watershed Conservancy v. Johnson, 165 F.3d 283, 288 (4th Cir. 1999); Davis Mountains Trans-Pecos Heritage Ass'n. v. Fed. Aviation Admin., 116 F. App'x 3, 8 (5th Cir. 2004); Latin Americans for Soc. & Econ. Dev. v. Adm'r of Fed. Highway Admin., 756 F.3d 447, 464, FN 10 (6th Cir. 2014) *cert. denied sub nom.* Detroit Int'l Bridge Co. v. Nadeau, 135 S. Ct. 1411, 191 L. Ed. 2d 363 (2015); Sierra Club v. Marita, 46 F.3d 606, 619 (7th Cir. 1995); Cent. S. Dakota Co-op. Grazing Dist. v. Sec'y of U.S. Dep't of Agric., 266 F.3d 889, 894 (8th Cir. 2001); Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1193 (9th Cir. 2008); New Mexico ex rel. Richardson v. Bureau of Land Management, 565 F.3d 683, 704 (10th Cir. 2009); Sierra Club v. U.S. Army Corps of Engineers, 295 F.3d 1209, 1216 (11th Cir. 2002).

[135] *See, e.g.*, Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council, Inc., 462 U.S. 87, 101, 103 S. Ct. 2246, 2254, 76 L. Ed. 2d 437 (1983) (upholding the Nuclear Regulatory Commission's environmental analysis of nuclear waste storage options).

[136] Barnes v. U.S. Dep't of Transp., 655 F.3d 1124,1136–38 (9th Cir. 2011) (rejecting DOT's unsupported statement that air traffic would increase at the same rate irrespective of airport expansion); Florida Wildlife Fed'n v. U.S. Army Corps of Engineers, 401 F. Supp. 2d 1298, 1324 (S.D. Fla. 2005) (Corp's argument about the "inevitability" of development somehow broke any causal connection was not only unsupported by the record, but is also legally untenable); Coal. For Canyon Pres. v. Bowers, 632 F.2d 774, 782 & n.3 (9th Cir. 1980) (rejecting unsupported statement in highway project EIS that "pollution would 'occur anyhow' because traffic was bound to increase", finds that this "fail[ed] to give decision makers who are removed from the initial decision sufficient data from which to draw their own conclusions about air, noise, and water pollution").

[137] Dep't of Transp. v. Pub. Citizen, 541 U.S. 752, 768 (2004); Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council, Inc., 462 U.S. 87, 97 (1983); Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349, 109 S. Ct. 1835, 1845, 104 L. Ed. 2d 351 (1989).

[138] Dep't of Transp. v. Pub. Citizen, 541 U.S. 752, 754, 124 S. Ct. 2204, 2207, 159 L. Ed. 2d 60 (2004) ("inherent in NEPA and its implementing regulations is a 'rule of reason,' which ensures that agencies determine whether and to what extent to prepare an EIS based on the usefulness of any new potential information to the decisionmaking process").

the means to obtain that information, the courts will generally require that it be included in the EIS.

Finally, when reviewing EISs and other NEPA documents, courts will typically defer to CEQ's official interpretation of the statute. The Supreme Court has noted that CEQ's NEPA regulations are entitled to "substantial deference."[139] CEQ's guidance documents are entitled to less deference than the regulations, but are nonetheless an important guidepost for courts.[140] Even before CEQ issued formal NEPA regulations, the Supreme Court held that CEQ's determinations about NEPA (and its application to a particular project) are "entitled to great weight."[141]

B. Indirect Effects

The NEPA regulations specify that indirect effects are "caused by the action and are later in time or after removed in distance, but are still reasonably foreseeable."[142] Courts conduct a two-pronged inquiry to determine whether a particular environmental impact qualifies: first, is there a sufficient causal connection between the proposed action and the environmental impact, and second, is the environmental impact reasonably foreseeable? To establish a sufficient causal connection between a proposed federal action and an environmental impact, courts ask whether the proposed action is a cause-in-fact of the impact, i.e., the impact would not occur *but for* the proposed action, and whether there is a "reasonably close causal relationship akin to proximate cause in tort law."[143] 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."[144] The First Circuit has outlined a set of factors for determining whether an impact is definite enough to take into

[139] Andrus v. Sierra Club, 442 U.S. 347, 358 (1979) (referring to CEQ regulations). See also Robertson v. Methow Valley Citizens Council (1989) 490 U.S. 332, 355 (1989) (CEQ regulations entitled to "substantial deference").

[140] Recently, the Supreme Court signaled its dissatisfaction with the idea that agencies should be given greater deference when interpreting their own regulations (commonly referred to as *Auer* or *Seminole Rock* deference), but it has not wholly abandoned or rejected this form of deference. See, e.g., Perez v. Mortage Bankers Association at FN 4 (even under *Auer* deference, "it is the court that ultimately decides whether a given regulation means what the agency says").

[141] Warm Springs Dam Task Force v. Gribble, 417 U.S. 1301, 1310 (1974) (enjoining construction of a dam pending appeal of EIS, based in part on filings from CEQ concerning the inadequacy of the EIS).

[142] 1508.8(b)

[143] Dep't of Transp. v. Pub. Citizen, 541 U.S. 752, 754, 124 S. Ct. 2204, 2207, 159 L. Ed. 2d 60 (2004) (citing *Metropolitan Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 774, 103 S.Ct. 1556, 75 L.Ed.2d 534) (internal citations omitted).

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

account or too speculative to warrant consideration, including the likelihood of the impact, the utility of the information to the looming decision, and whether the absence of such information now would foreclose its consideration later.[145] Because the basic thrust of an agency's responsibilities under NEPA is to predict future environmental impacts, agencies must use "[r]easonable forecasting and speculation" to evaluate impacts even when there is uncertainty about the nature and timing of those impacts.[146] Moreover, as noted in Section 3.3, the NEPA regulations impose an affirmative obligation on agencies to procure information regarding reasonably foreseeable impacts when possible.[147] Where the EIS contains information about induced growth or other indirect effects in the description or justification of the proposed action, the agency must use this information to evaluate indirect effects.[148] The agency must also respond to such information when it is provided through public comments.[149]

To further clarify these obligations, some courts have used the analogy of "links in a chain" to describe the scope of indirect effects (and effects from related actions) that should be reviewed in NEPA documents.[150] This analogy is helpful for thinking about the scope of NEPA analysis for

[145] Sierra Club v. Marsh, 976 F.2d 763, 768 (1st Cir. 1992), citing *Sierra Club I,* 769 F.2d at 878; *Massachusetts v. Watt,* 716 F.2d 946, 952-53 (1st Cir.1983)).

[146] Scientists' Inst. for Pub. Info., Inc. v. 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.").

[147] 40 C.F.R. § 1502.22

[148] *See, e.g.,* Tomac v. Norton, 240 F.Supp.2d 45, 51-52 (D.D.C. 2003) (BIA provided its own projections for socioeconomic growth caused by casino project, but did not discuss the associated impacts on air, water, etc. Court held that BIA could not say these impacts were "speculative" when it had provided the growth projections); Friends of the Earth, Inc. v. United States Corps of Engineers, 109 F.Supp.2d 30, 33 (D.D.C. 2000) ("Since economic development of these areas is the announced goal and anticipated consequence of the casino projects, the Corps cannot claim that the prospect of indirect secondary development is 'highly speculative').

[149] Mid States Coal. for Progress v. Surface Transp. Bd., 345 F.3d 520, 550 (8th Cir. 2003).

[150] Sylvester v. U.S. Army Corps of Engineers, 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* Border Power Plant Working Grp. v. 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. Ocean Mammal Inst. v. Cohen, 164 F.3d 631 (9th Cir. 1998); Florida Audubon Soc. v. Bentsen, 94 F.3d 658, 668-70 (D.C. Cir. 1996).

greenhouse gas emissions from fossil fuel extraction and transportation projects. The various stages of fossil fuel production, transportation, processing and consumption can also be thought of as "links in a chain" which should be analyzed together. Thus far, most courts have agreed with this approach.[151]

The following sections address the common themes and issues that have recurred to date, and that will define the future direction of courts' review of upstream and downstream emissions analysis under NEPA's indirect effects requirement.

1. Fossil Fuel Extraction

Since 2014, there have been five district court decisions regarding the scope of downstream emissions that must be evaluated in NEPA reviews for coal lease modifications and other approvals involving the extraction of coal from federal lands.[152] In four of these cases, district courts in Colorado and Montana determined that the responsible agencies failed to take the requisite "hard look" at downstream emissions from the combustion of the coal.[153] In the fifth case, a district court in Wyoming held that the agency's analysis of downstream emissions was adequate, in part because the agency had already disclosed emissions from coal combustion.[154] There has not yet been any decision regarding an agency's obligation to evaluate downstream

[151] *See e.g.*, Border Power Plant Working Grp. v. Dep't of Energy, 260 F. Supp. 2d 997, 1013-17 (S.D. Cal. 2003) (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).

[152] As discussed below, there is also a 2009 decision from the Ninth Circuit Court of Appeals requiring analysis of downstream emissions from transporting and processing gold in the EIS for a proposed gold mine. There was considerable overlap between the issues in that case and those involving the scope of downstream emissions that must be analyzed for coal extraction. S. Fork Band Council Of W. Shoshone Of Nevada v. U.S. Dep't of Interior, 588 F.3d 718 (9th Cir. 2009).

[153] High Country Conservation Advocates v. United States Forest Serv., 52 F. Supp. 3d 1174 (D. Colo. 2014) (USFS must consider downstream emissions from coal combustion); Dine Citizens Against Ruining Our Env't v. United States Office of Surface Mining Reclamation & Enf't, 82 F. Supp. 3d 1201 (D. Colo. 2015) (OSM must consider downstream emissions from coal combustion); WildEarth Guardians v. United States Office of Surface Mining, Reclamation & Enf't, 104 F. Supp. 3d 1208, 1230 (D. Colo. 2015) (OSM must consider downstream emissions from coal combustion); Wildearth Guardians v. U.S. Office of Surface Mining, Reclamation & Enf't, No. CV 14-103-BLG-SPW, 2015 WL 6442724 (D. Mont. Oct. 23, 2015) report and recommendation adopted in part, rejected in part sub nom. Guardians v. U.S. Office of Surface Mining, Reclamation & Enf't, No. CV 14-103-BLG-SPW, 2016 WL 259285 (D. Mont. Jan. 21, 2016) (OSM failed to take hard look at environmental impacts when issuing FONSI, including downstream greenhouse gas emissions).

[154] Wildearth Guardians v. OSM, No. 12-CV-85-ABJ (D. Wyoming 2015).

emissions in the context of oil or gas extraction, but there is a pending administrative objection to the EIS for oil and gas leasing in the Pawnee National Forest.[155]

Notably, all of the cases have found that there is a sufficient causal connection between the extraction of coal and the downstream greenhouse gas emissions from the processing, transportation, and end-use of the extracted coal. In doing so, the courts have rejected three types of arguments against causation, which we will refer to as the "status quo" argument, the "perfect substitute" argument, and "it's not our call" argument. In addition, courts have addressed questions of the foreseeability of downstream emissions in the context of extraction projects.

a. <u>The "Status Quo"</u>

The "status quo" argument has arisen in the context of proposals to re-authorize or expand mines that are already in operation, where agencies have asserted that the continued operation of the mine will not increase the *rate* at which coal is extracted and thus they will not increase combustion emissions, as compared with the status quo.[156] The Ninth Circuit's decision in *South Fork Band of Western Shoshone of Nevada v. U.S. Department of Interior*, which did not involve fossil fuels or greenhouse gas emissions, sets the stage for how later courts' treatment of this line of argument. In that case, a group of Native American tribes challenged BLM's approval and corresponding NEPA review of a gold mine, and alleged that BLM had failed to analyze the air quality impacts of transporting and processing the gold ore that would be generated as a result of the mining approval. Causation was not an issue, as it was well known that the ore would be transported via an established route to an existing gold processing facility. Instead, BLM argued that the emissions need not be analyzed because it did not forecast any change in the rate of shipping and processing—and thus the proposed action would not cause an increase in emissions over the status quo.[157] The court flatly rejected this argument, noting that "the mine expansion will

[155] Wildearth Guardians v. Casamassa (U.S. Forest Serv., filed Jan. 2015).
[156] Dine Citizens Against Ruining Our Env't v. United States Office of Surface Mining Reclamation & Enf't, 82 F. Supp. 3d 1201, 1217 (D. Colo. 2015); S. Fork Band Council Of W. Shoshone Of Nevada v. U.S. Dep't of Interior, 588 F.3d 718, 725 (9th Cir. 2009).
[157] S. Fork Band Council Of W. Shoshone Of Nevada v. U.S. Dep't of Interior, 588 F.3d 718, 725 (9th Cir. 2009)

create ten additional years of such transportation that is, ten years of environmental impacts that would not be present in the no-action scenario."[158]

Subsequently, in *Diné Citizens Against Ruining Our Environment v. U.S. Office of Surface Mining Reclamation and Enforcement*, a district court judge in Colorado rejected the same argument in a case directly implicating greenhouse gases. Here, the Office of Surface Mining (OSM) had published an Environmental Assessment (EA) for the proposed expansion of a coal mine, in which it concluded that there would be no significant air quality effects. The EA analyzed the effects of mining and transporting coal to a specific power plant, but did not consider the effects of coal combustion.[159] As with the *South Fork Band of Western Shoshone* case, causation itself was not an issue: The mine supplied coal directly to a power plant, and the proposed expansion of the mine was necessary for the mine to continue meeting its contractual obligations to that plant. Moreover, it was not economically feasible for the plant to secure coal from any other source. Thus, all parties agreed, "but for [OSM's] approval of the permit revision application, coal would not be mined…and the environmental impacts associated with the combustion of the mined coal would not occur."[160] Accordingly, plaintiffs argued that the effects of coal combustion must be considered as "indirect effects" of the action.[161] OSM argued that the proposed mine expansion would not change the status quo with respect to the rate of coal combustion at the power plant. The court found for plaintiffs, noting that even if the proposed expansion does not increase the rate of coal combustion at the power plant it would allow the mine to continue supplying coal, resulting in the combustion of an additional 12.7 million tons of coal over the term of the supply contract.[162] The court held that the agency must therefore account for the effects of continuing coal combustion as compared with what would happen if the mine expansion were not authorized.

[158] *Id.* at 725-26.
[159] Dine Citizens Against Ruining Our Env't v. United States Office of Surface Mining Reclamation & Enf't, 82 F. Supp. 3d 1201, 1213 (D. Colo. 2015), *appeal dismissed* (Aug. 18, 2015)
[160] *Id.* at 1212-13 (citing the Respondents' Brief at 36).
[161] *Id.* at 1212.
[162] *Id.* at 1214.

In short, courts have rejected the "status quo" argument, holding that the continued operation of mines generates additional emissions over a period of time even if it does not change the rate at which those emissions are generated, and this effect must be evaluated under NEPA.[163]

b. The "Perfect Substitute"

The "perfect substitute" argument posits that the extraction of fossil fuels will not actually cause an increase in consumption, because the same quantity of the fuel would be produced elsewhere and eventually transported and consumed, even if the agency did not approve the proposal at issue.[164] Here, recent cases begin to give shape to NEPA's requirements.

High Country Conservation Advocates v. United States Forest Service, from the district court in Colorado, was the first case that specifically examined an agency's obligation to evaluate downstream greenhouse gas emissions from coal production in NEPA reviews. The case involved two related EISs—one for a proposed exemption to the Colorado Roadless Rule to allow road construction for coal-related activities on approximately 20,000 acres of previously undeveloped national forest ("Colorado Roadless Rule EIS"), and another for the proposed modification of two existing coal leases to add some of those newly opened lands to the leases ("Lease Modification EIS"). USFS prepared both EISs in conjunction with BLM. In the Lease Modification EIS, the agencies acknowledged that greenhouse gas emissions from the combustion of coal should be evaluated as indirect effects and estimated those emissions along with emissions from the mining operations.[165] However, in the Colorado Roadless Rule EIS, the agencies did not estimate emissions from future mining operations or coal combustion. The agencies argued, in part, that combustion emissions need not be disclosed because the overall amount of coal consumed by the marketplace would remain unchanged because there are perfect substitutes for the coal that would be produced.[166]

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[163] *Id.*; S. Fork Band Council Of W. Shoshone Of Nevada, 588 F.3d at 725-26.

[164] See, e.g., BUREAU OF LAND MGMT., FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE WRIGHT AREA COAL LEASE APPLICATIONS, 4-141 (July 2010).

[165] High Country Conservation Advocates v. United States Forest Serv., 52 F. Supp. 3d 1174, 1190 (D. Colo. 2014)(the court nonetheless held that the agencies' analysis was inadequate, because they had quantified the economic benefits of coal production but had not used the federal Social Cost of Carbon (SCC) tool to quantify the economic costs of coal production).

[166] *Id.* at 1196.

The United States District Court for the District of Colorado rejected this argument, finding that the argument was illogical because the production of coal under the exemption will "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."[167] Thus, the court held that "this reasonably foreseeable effect must be analyzed, even if the precise extent of the effect is less certain."[168] The court also held that the agencies had failed to engage with an expert report submitted by plaintiffs during the comment period, which refuted the agencies' conclusions about perfect substitution, and this failure was a violation of the NEPA regulations which require agencies to respond to comments in the final EIS.[169]

In *Wildearth Guardians v. U.S. Forest Service* a district court judge in Wyoming apparently ignored an agency's "perfect substitute" argument in finding an EIS sufficient. The case involved an EIS for six coal lease approvals in which BLM had quantified emissions from coal combustion but ultimately concluded that these emissions would probably not differ under the proposed action and the no action alternative because there were other sources of coal that could be substituted for this one. BLM also noted that the transportation of coal via rail would generate greenhouse gas emissions, but did not quantify those emissions due to a lack of information.[170] The court held that this analysis of downstream impacts was adequate, because the agency had accounted for the effect of the proposed extraction on the combustion of coal and had identified areas of uncertainty.[171]

However, the court did not acknowledge or respond to plaintiffs' contention that BLM's conclusion that greenhouse gas emissions would not change under the no action alternative was not supported by the record.[172] The plaintiffs noted that BLM provided "no information or analysis" to support this assertion, and argued that BLM had ignored economic analysis to the

[167] *Id.* at 1198.
[168] *Id.*
[169] *Id.* (citing 40 C.F.R. § 1502.9(b)).
[170] Wild Earth Guardians v. United States Forest Serv., 120 F. Supp. 3d 1237, 1272 (D. Wyo. 2015).
[171] *Id.* The court did not specifically examine whether the agency had reasonably concluded that transportation emissions were too speculative to quantify because the plaintiffs had not specifically raised this issue in their complaint.
[172] Petitioner's Opening Brief, Wildearth Guardians and Sierra Club v. Bureau of Land Mgmt., Case No. 13-CV-00042 (Nov. 24, 2013) at 50-51.

contrary as well as recent case law rejecting the "perfect substitution" argument.[173] The issue has now been appealed to the Tenth Circuit Court of Appeals.[174]

None of the other decisions involving fossil fuel extraction have directly confronted the perfect substitution argument. There is, however, a clear parallel between this and the status quo argument that was rejected in *South Fork Band of Western Shoshone* and *Diné Citizens*. When arguing that there is a "perfect substitute" for the extracted resource, agencies are essentially arguing that the *rate* of extraction and consumption will not increase within a given period, without considering whether the *duration* may be prolonged.[175] Moreover, as discussed below, courts have also rejected the perfect substitute argument in the context of NEPA reviews for coal rail lines.[176]

c. Disclaiming Discretion: "It's Not Our Call"

The third argument proffered by agencies in defense of not assessing downstream emissions as indirect effects is that there is not a "reasonably close causal relationship akin to proximate cause" between the extraction of the coal and emissions from downstream activities such as the combustion of the coal, because the agency lacks jurisdiction over those activities. To support this argument, agencies typically cite *Department of Transportation v. Public Citizen*.[177] In *Public Citizen*, the Supreme 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.[178] The Court noted that the agency's lack of such discretion was a "critical

[173] *Id.*

[174] Wildearth Guardians v. Bureau of Land Management, Case No. 15-8109 (filed 1/29/2016).

[175] This appears to be the case for the EIS at issue in Wildearth Guardians v. U.S. Forest Serv., 120 F. Supp. 3d 1237 (D. Wyo. 2015). *See* Bureau of Land Mgmt., Final Environmental Impact Statement for the Wright Area Coal Lease Applications (July 2010) (noting that the issuance of the coal leases probably would not affect U.S. CO2 emissions because there are other sources that could supply the demand for coal, without considering whether the approval of leases would affect the duration of coal production and consumption in the long term).

[176] *See infra* Section IV(B)(2).

[177] Dep't of Transp. v. Pub. Citizen, 541 U.S. 752, 770, 124 S. Ct. 2204, 2217, 159 L. Ed. 2d 60 (2004)

[178] The narrow holding in *Public Citizen* was based on a very specific set of facts. The President had announced plans to lift a moratorium on the operation of Mexican motor carriers in the U.S., pending the promulgation of application and safety-inspection regulations. Pursuant to the President's directive, the Federal Motor Carrier Safety Administration (FMCSA) published the proposed rules and an accompanying Environmental Assessment (EA). The EA did not account for the environmental impacts from the increased presence of Mexican trucks in the U.S., concluding that this impact was a result of the moratorium being lifted, and not the promulgation of application and safety requirements. The Supreme Court affirmed FMCSA's decision because it found that FMCSA had absolutely "no ability" to exclude Mexican motor carriers from operating within the United States, and thus there was an insufficient causal relationship between FMCSA's proposed regulations and the environmental impacts of those carriers operating in the United States . Dep't of

feature" of the case. It explained that there was no reason to collect and analyze information about a particular set of impacts when the agency "simply lacks the power to act on" that information.[179]

Reviewing courts have determined that their reliance on this case is misplaced. As noted in Part I, BLM and USFS have considerable discretion to account for environmental concerns, including downstream emissions, when deciding whether and to what extent federal lands should be made available for fossil fuel leasing. Moreover, downstream emissions—particularly those from the combustion of fossil fuels—are clearly relevant to the question of whether the agency should authorize their extraction. Thus, the holding in *Public Citizen* does not, on its face, apply to these types of decisions. Moreover, the interpretation of *Public Citizen* advanced by some government agencies would directly contradict the NEPA regulations calling for consideration of "growth-inducing effects" and decades of case law requiring agencies to evaluate the effect of their proposals on patterns of private development and other activities outside of their jurisdiction.[180]

Accordingly, in *Diné Citizens Against Ruining Our Environment v. U.S. Office of Surface Mining Reclamation and Enforcement*, a district court rejected OSM's argument that it lacked authority over operations at the power plant to be fed by the mine and thus had "no ability to prevent" the emissions, noting that OSM's regulations allow it to deny the proposed mine expansion based on environmental considerations and *Public Citizen* was therefore inapposite.[181] The court reached the same decision in *Wildearth Guardians v. U.S. Office of Surface Mining, Reclamation and Enforcement*, a case similar to *Diné Citizens* and decided on similar grounds.[182]

Transp. v. Pub. Citizen, 541 U.S. 752, 766, 124 S. Ct. 2204, 2214, 159 L. Ed. 2d 60 (2004) (citing FMCSA's statutory obligations under 49 U.S.C. s. 13902(a)(1)).

[179] Dep't of Transp. v. Pub. Citizen, 541 U.S. 752, 768, 124 S. Ct. 2204, 2216, 159 L. Ed. 2d 60 (2004) ("the environmental impact of the cross-border operations would have no effect on FMCSA's decision-making—FMCSA simply lacks the power to act on whatever information might be contained in the EIS").

[180] *See, e.g.*, Border Power Plant Working Grp. v. Dep't of Energy, 260 F. Supp. 2d 997, 1017 (S.D. Cal. 2003); Friends of the Earth, Inc. v. United States Corps of Engineers, 109 F.Supp.2d 30, 33 (D.D.C. 2000); City of Davis v. Coleman, 521 F.2d 661, 675 (9th Cir. 1975).

[181] Dine Citizens Against Ruining Our Env't v. United States Office of Surface Mining Reclamation & Enf't, 82 F. Supp. 3d 1201, 1217 (D. Colo. 2015). The court cited regulations which require the agency to ensure that endangered species will not be harmed before approving the permit. 30 C.F.R. § 773.15(j). Notably, these regulations also require assurance that the "operation has been designed to prevent material damage to the hydrologic balance outside the permit area. 30 C.F.R. § 773.15(e).

[182] WildEarth Guardians v. United States Office of Surface Mining, Reclamation & Enf't, 104 F. Supp. 3d 1208, 1230 (D. Colo. 2015).

d. The Foreseeability of Downstream Emissions

With regards to foreseeability, the courts have generally held that agencies have sufficient data and tools to estimate greenhouse gas emissions from the combustion of coal. They have also recognized that tools are available to evaluate how the extraction of coal will influence coal markets. However, the courts have not directly addressed whether greenhouse gas emissions from coal transportation and processing are also "reasonably foreseeable"—at least to the extent that they would warrant quantitative disclosure.[183]

For example, in *High Country Conservation Advocates v. USFS*, federal agencies assessing the environmental impacts of the Colorado Roadless Rule did not estimate emissions from future mining operations or coal combustion to be permitted under the rule, reasoning that such emissions were too speculative.[184] The district court rejected this argument, noting that the EIS contained detailed projections of coal removal and associated economic benefits which were based on three existing mines in the area.[185] The agencies knew the methane emission rates from these mines and could use that information to project future mining emissions under the rule.[186] The court also noted that the agencies' proffered explanation for omitting these emissions was "belied by the agencies' decision to include detailed projections and analysis of tax revenue, employment statistics, and other environmental interests" in the EIS and that it was "arbitrary to offer detailed projections of a project's upside while omitting a feasible projection of the project's costs."[187]

[183] Although there has been no formal decision regarding the scope of an agency's obligation to evaluate transportation or processing emissions in a NEPA review for coal extraction, there are several cases that have touched on this issue, S. Fork Band Council Of W. Shoshone Of Nevada v. U.S. Dep't of Interior, 588 F.3d 718 (9th Cir. 2009) (requiring analysis of emissions from gold transportation and processing where information was available to calculate those emissions); Dine Citizens Against Ruining Our Env't v. United States Office of Surface Mining Reclamation & Enf't, 82 F. Supp. 3d 1201, 1213 (D. Colo. 2015) (noting that transportation-related impacts had already been accounted for in the EIS); Wildearth Guardians v. OSM, Case No. 12-CV-85-ABJ (D. Wyoming 2015) (upholding an agency's analysis of downstream emissions, and noting that transportation emissions had been briefly discussed but not quantified).

[184] High Country Conservation Advocates v. United States Forest Serv., 52 F. Supp. 3d 1174, 1196 (D. Colo. 2014).

[185] *Id.*

[186] *Id.*

[187] *Id.* at 1195 (citing *Scientists' Inst. for Pub. Info., Inc. v. Atomic Energy Comm'n,* 481 F.2d 1079, 1097 (D.C.Cir.1973) and *Sierra Club v. Sigler,* 695 F.2d 957, at 979 ("There can be no 'hard look' at costs and benefits unless all costs are disclosed.")).

The court reached a similar conclusion about the agencies' ability to forecast combustion emissions. The agencies asserted that these emissions were too speculative to disclose because: (1) this would require analyzing the effects of coal that "may or may not be produced over a wide area from mines that may or may not be developed" as a result of the rule, (2) power plants have varying degrees of efficiency, and the emissions rate for the facilities that would consume this coal was unknown, and (3) currently unavailable technology like carbon capture and sequestration may be widely adopted by the time the coal is burned. The court quickly rejected the first argument, stating that:

> 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.[188]

Turning to the second argument, the court noted that the agency had estimated combustion emissions in the Lease Modifications EIS despite uncertainty about power plant efficiency and there was no reason that the agencies could not provide similar estimates in the Colorado Roadless Rule EIS.[189] The court quickly dismissed the third argument as well, holding that the agencies "cannot rely on unsupported assumptions that future mitigation technologies will be adopted" to avoid disclosing environmental impacts.[190]

Similarly, in *Diné Citizens Against Ruining Our Environment v. U.S. Office of Surface Mining Reclamation and Enforcement*, the district court found that combustion emissions associated with a mine that fed a single power plant were reasonably foreseeable, because the agency knew where the coal would be consumed:

> Unlike a scenario in which a coal mine markets its coal freely to multiple buyers, each of whom uses that coal in different applications under different constraints, there is virtually no uncertainty regarding when, where, and how the coal mined as a result of NTEC's proposed mine expansion will be combusted. ... Because there is no uncertainty as to the

[188] *Id.* at 1196-97 (internal citations omitted).

[189] *Id.* at 1197 ("There is no reason to believe that variations in powerplant efficiency posed no obstacle to making reasonable estimates of emissions associated with the Lease Modifications but that those same variations in efficiency posed an insurmountable hurdle to making estimates from coal combustion associated with the three identified mines in the North Fork exemption.").

[190] *Id.* (citing *New York v. Nuclear Regulatory Comm'n,* 681 F.3d 471, 478–79 (D.C.Cir.2012) (finding a NEPA violation where the agency decided to ignore future impacts based only on "reasonable assurance[s]" that the impacts would be avoided later); *see also Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1381 (9th Cir.1998) (holding that an EIS discussion of mitigation violated NEPA in part because it was "not clear whether any mitigation measures would in fact be adopted")).

> location, the method, or the timing of this combustion, it is possible to predict with certainty the combustion-related environmental impacts.[191]

Importantly, the court's comment about the uncertainty of combustion emissions under an alternate scenario does not mean that such emissions need not be disclosed in NEPA reviews. Pursuant to the holding in *High Country,* such emissions must be disclosed even if there is uncertainty about where and when the coal will be combusted.

2. Fossil Fuel Transportation

Courts have looked at the scope of upstream and downstream emissions that should be evaluated in NEPA reviews of projects intended to transport fossil fuels from production to end use in different ways, depending on the nature of the transportation infrastructure. Courts have found that rail lines built for coal require both upstream and downstream emissions analysis, at least in some circumstances. By contrast, courts have not yet issued any decisions requiring analysis of upstream or downstream emissions in NEPA reviews for oil and gas pipelines. Neither courts nor the agencies have yet offered any principled basis for the distinction. This section looks at the cases and arguments that have been raised in each context.

a. Rail Lines for Coal

The Eighth Circuit's decision in *Mid States Coalition for Progress v. Surface Transportation Board* was the first involving an agency's obligation to address downstream emissions from the combustion of fossil fuels that would be transported as a result of the agency action. At issue was the Surface Transportation Board (STB)'s approval and EIS for the construction of and upgrade to rail lines to service coal mines in Wyoming's Powder River Basin. Petitioners argued that STB had failed to consider the air quality and greenhouse gas effects associated with an increase in the supply of low-sulfur coal to power plants that would occur as a result of this project. The court agreed.[192]

[191] Dine Citizens Against Ruining Our Env't v. United States Office of Surface Mining Reclamation & Enf't, 82 F. Supp. 3d 1201, 1213 (D. Colo. 2015), *appeal dismissed* (Aug. 18, 2015) *See also* WildEarth Guardians v. United States Office of Surface Mining, Reclamation & Enf't, 104 F. Supp. 3d 1208, 1230 (D. Colo. 2015) ("[t]he interdependence between the mines and the Craig Power Plant effectively guarantees the foreseeability of combustion-related effects").

[192] Mid States Coal. for Progress v. Surface Transp. Bd., 345 F.3d 520, 549 (8th Cir. 2003).

The record before the agency included comments explaining that the projected availability of 100 million tons of low-sulfur coal per year at reduced rates will increase the consumption of low-sulfur coal vis-à-vis other fuels (e.g., natural gas), and this could significantly increase emissions of CO2, N2O, particulates, and mercury.[193] STB acknowledged that many utilities "will likely shift to the low-sulfur variety of coal" supplied by the rail line, due to the need to comply with Clean Air Act restrictions on sulfur dioxide emissions.[194] STB argued, however, that the shift would occur regardless of whether the new line is constructed, and that the new line would simply provide a shorter and straighter route for the transportation of this coal to power plants.[195]

The court disagreed with STB's perfect substitution argument. It noted that this proposition was "illogical at best" because the "increased availability of inexpensive coal will at the very least make coal a more attractive option to future entrants into the utilities market when compared with other potential fuel sources, such as nuclear power, solar power, or natural gas" and that the project will "most assuredly affect the nation's long-term demand for coal."[196]

With regards to foreseeability, STB further argued that it would "need to know where [the power plants] will be built, and how much coal these new unnamed power plants would use" in order to analyze emissions from induced coal consumption. The court disagreed, noting that even if the *extent* of the effect was speculative, the *nature* of the effect was "far from speculative" in this context.[197] Where the nature of the effect is reasonably foreseeable but its extent is not, the court held that the agency may not simply ignore the effect, but rather must comply with the regulatory procedure for evaluating environmental impacts when there is incomplete or unavailable information.[198] The court also noted that the agency had received comments describing computer programs that could be used to forecast the effects of this project on the consumption of coal.[199]

On remand from *Mid States Coalition*, STB prepared a revised EIS with an updated analysis of downstream emissions based on the Energy Information Administration (EIA)'s National Energy Modeling System (NEMS). STB concluded that the projected increase in CO_2 and other air

[193] *Id.* at 548.
[194] *Id.* at 549.
[195] *Id.*
[196] *Id.*
[197] *Id.*
[198] *Id.* at 549-50 (citing 40 C.F.R. § 1502.22).
[199] *Id.* at 550.

emissions would increase less than 1% based on this model. The adequacy of this analysis was challenged in a subsequent case, *Mayo Foundation v. Surface Transportation Board* (8th Cir. 2006), with one of the petitioners (Sierra Club) arguing that the utilization of this model was arbitrary and capricious because 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."[200]

In other words, Sierra Club asserted that STB should have considered the impacts from the combustion of *all* of the transported coal, as opposed to the incremental addition in coal use as calculated by the NEMS model. The court dismissed this argument, noting that STB had "extensively discuss[ed] the potential impacts on air quality that may result from the implementation of the project."[201]

Several years later, in *Northern Plains Council v. Surface Transportation Board,* the 9th Circuit Court of Appeals held that STB is also required to evaluate emissions and other environmental impacts from coal mines in NEPA reviews of rail lines constructed to service those mines. Notably, petitioners in this case 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. The court held that the emissions were clearly foreseeable for two reasons: (1) STB knew that the federal government had transferred land for these coal mines and the draft EIS included a map with the sites of future coal mines, (2) STB had relied on the coal mine development to justify the financial soundness of the proposal, and had even included tonnage forecasts in its final decision.[202] Thus, STB's failure to disclose methane emissions from these mines was arbitrary and capricious.

Taken together, these cases have put the STB on notice that it should evaluate both upstream and downstream emissions in NEPA reviews for coal rail lines. However, as discussed below, the courts have not yet required a similar analysis for oil and gas pipelines, despite the similarities between these types of projects.

[200] Mayo Found. v. Surface Transp. Bd., 472 F.3d 545, 556 (8th Cir. 2006).
[201] *Id.*
[202] N. Plains Res. Council, Inc. v. Surface Transp. Bd., 668 F.3d 1067, 1080 (9th Cir. 2011).

b. Pipelines for Oil and Gas

South Coast Air Quality Management District v. FERC, decided by the 9th Circuit Court of Appeals in 2010, was the first case involving FERC's analysis of downstream emissions from the end-use of natural gas in an EIS for a pipeline project. The case did not involve the agency's obligation to evaluate indirect greenhouse gas emissions, but rather emissions of conventional air pollutants. Petitioners argued that FERC had failed to adequately analyze the increase in NO_x emissions that would result from the burning of the natural gas transported via the pipeline. FERC argued that such emissions would be generated from activities outside of its jurisdiction and were thus beyond the scope of its NEPA review.

The court stated that it was unnecessary to determine whether FERC "was required under NEPA to analyze the environmental impacts of emissions resulting from the burning of gas supplied by the pipeline to consumers" because FERC explicitly stated that it considered those impacts in its EIS.[203] Under these circumstances, the court held that the appropriate inquiry was whether FERC's analysis of downstream effects was adequate.[204] Thus, the court did not reach FERC's jurisdictional argument.

The court held that the EIS was adequate because "FERC explicitly considered the environmental impact of downstream emissions and imposed what it reasonably believed to be effective measures to mitigate the impact."[205] Specifically, FERC had acknowledged the fact that the pipeline would "substantially increase emissions of the ozone precursor NO_x in the South Coast Air Basin, directly affecting air quality and making attainment of the Federal air quality standards more difficult."[206] Based on this conclusion, FERC determined that the pipeline certificate should be conditioned on the guarantee that the pipeline will "only deliver gas that meets the strictest applicable gas quality standards imposed by state regulatory agencies on downstream [local distribution companies] and pipelines."[207] FERC concluded that with this

[203] S. Coast Air Quality Mgmt. Dist. v. F.E.R.C., 621 F.3d 1085, 1093 (9th Cir. 2010)
[204] Id.
[205] *Id.* at 1093-94.
[206] *Id.* at 1093 (9th Cir. 2010).
[207] *Id.*

mitigation measure in place, the approval of the pipeline "should not result in a material increase in air pollutant emissions."[208]

As noted above, the court did not reach FERC's argument that it lacked jurisdiction over downstream emissions and thus need not consider them in the NEPA review. But the petitioners raised a compelling counterpoint to this argument in their brief: FERC's ability to impose the restriction on the natural gas delivered via the pipeline demonstrated that the commission had "abundant authority" to consider and mitigate air quality impacts in pipeline approvals, and thus distinguishes these approvals from the regulatory action at issue in *Public Citizen*.[209]

That same year, in *Sierra Club v. Clinton*, a district court in Minnesota held that the State Department was not required to evaluate upstream emissions in the EIS for a pipeline intended to transport Canadian tar sands oil to U.S. markets.[210] The record and legal analysis were very different than those in *South Coast Air Quality*—that case dealt with *how* an agency should analyze downstream emissions (since FERC had conceded that the emissions would be generated as a result of the project, causation was not an issue), whereas this case dealt with *whether* the pipeline would cause any upstream emissions that must be analyzed in the EIS.

The State Department argued that the development of the Canadian tar sands and the corresponding environmental impacts would occur regardless of whether it approved the proposed pipeline, and thus it need not analyze those impacts (echoing the "status quo" argument advanced by agencies in other cases).[211] The District Court in Minnesota agreed, finding that the "administrative record demonstrates that the Canadian tar sands are being developed independently from the AC Pipeline project."[212] In reaching this decision, the court cited the following findings from expert reports: (i) the production of crude oil from Canadian tar sands was already increasing at a rapid rate, (ii) the primary constraints on further tar sands development included lower crude oil prices, increased natural gas usage, and local infrastructure issues in Canada, (iii) there were other means of transporting the oil to the U.S., and (iv) there were other markets where the oil could be consumed. The court further noted that the expert reports did not

[208] *Id.*

[209] Brief of Petitioners at 44, S. Coast Air Quality Mgmt. Dist. v. F.E.R.C., 621 F.3d 1085 (9th Cir. 2010).

[210] Sierra Club v. Clinton, 746 F. Supp. 2d 1025, 1045 (D. Minn. 2010).

a. [211] *Id.* at 1043.

[212] *Id.* at 1044.

cite the availability of pipeline capacity as a factor either driving or potentially impeding tar sands development.[213] Thus, the court concluded that the record indicated that oil from the tar sands would be transported with or without the proposed pipeline.[214]

The third and final case to evaluate an agency's obligation to evaluate indirect emissions from pipeline development was *Coalition for Responsible Growth and Resource Conservation v. FERC*. This case, decided by the Second Circuit Court of Appeals, concerned the scope of upstream effects that FERC must consider in the approval and EA for a natural gas pipeline. The court issued a very short unpublished opinion finding that FERC's analysis was adequate because "FERC included a short discussion of Marcellus Shale development in the EA, and FERC reasonably concluded that the impacts of that development are not sufficiently causally-related to the project to warrant a more in-depth analysis."[215]

3. Future Directions in Indirect Effects Analysis

There are now many decisions recognizing the causal linkages between different phases of the fossil fuel supply chain and the foreseeability of upstream and/or downstream greenhouse gas emissions within this supply chain. These include decisions requiring that agencies evaluate downstream emissions from coal combustion when approving coal mining plans and leases, and decisions requiring that agencies evaluate both upstream emissions from coal mining and downstream emissions from combustion when approving coal rail lines. In most of these decisions, courts have rejected arguments that the extraction or transportation of fossil fuels will not cause any increase in indirect greenhouse gas emissions, because there are "perfect substitutes" for those fuels that will be produced and consumed if the proposed action is not approved. However, courts have deferred to agencies' determinations that indirect emissions should be calculated based on the *net* increase in fossil fuel production and consumption associated with an increase in supply, taking into account the potential displacement of production and consumption from other sources.[216]

[213] *Id.* at 1045.
[214] Id.
[215] Coal. for Responsible Growth & Res. Conservation v. U.S. F.E.R.C., 485 F. App'x 472, 474 (2d Cir. 2012).
[216] *See, e.g.*, Mayo Found. v. Surface Transp. Bd., 472 F.3d 545, 556 (8th Cir. 2006), [cite others].

There are also cases and administrative challenges pending in Montana, Colorado, New Mexico and Wyoming in which plaintiffs have raised even more specific allegations about the scope of downstream emissions that must be considered prior to the approval of coal, oil and gas projects. These cases will address two unresolved questions: (1) under what circumstances are agencies required to disclose emissions from transportation and processing in the NEPA documents for extraction projects,[217] and (2) what downstream emissions must be analyzed in NEPA documents for oil and gas projects?[218]

The one context in which courts have not yet required an analysis of upstream or downstream emissions is the NEPA review of pipeline projects. Notably, none of the three decisions that has been issued in this context includes an explanation of why pipelines should be treated differently than coal rail lines, or why the "perfect substitution" argument should be accepted in this context but not the context of coal extraction and transportation. Moreover, those decisions are not necessarily determinative of future outcomes. In the first case, *South Coast Air Quality Management District v. FERC*, the court found that FERC had already conceded that the pipeline would "substantially increase" NOx emissions from combustion and implemented a mitigation measure to control those emissions, and thus it need not determine whether NEPA required such analysis.[219] The court's analysis in the second case, *Sierra Club v. Clinton*, was entirely dependent on the record before it.[220] Applying the same principles, but provided with evidence that the pipeline would induce additional oil or gas development, a court could reach the opposite conclusion about the agency's obligation to evaluate upstream emissions. Finally, *Coalition for*

[217] Wildearth Guardians v. Jewell, No. 15-cv-02026 (D. Colo., filed Sept. 15, 2015) (challenging approval of multiple mining plans in CO, NM, WY, and in particular, DOI's failure to consider downstream effects related to transport and combustion of coal); Wildearth Guardians v. Jewell, No. 15-cv-01984 (D. Colo., filed Sept. 11, 2015) (Challenging BLM/USFS approval of the Flat Canyon Coal Lease, and failure to analyze greenhouse gas emissions from coal mining, transport, or combustion); Montana Elders v. U.S. Office of Surface Mining, No. 9:15-cv-001016 (D. Mont., filed Aug. 17, 2015) (challenging approval of Bull Mountain Mine expansion in MT, and OSM's failure to take a hard look at the indirect and cumulative effects of coal transportation, coal exports, and coal combustion. Plaintiffs note that combined greenhouse gas emissions from mine operations, coal transportation, and coal combustion would be approximately 23 million metric tons of CO2e, more than the annual emissions of the largest single point source of greenhouse gas emissions in the U.S.); Wildearth Guardians v. Jewell, No. 14-cv-00112 (D.N.M., filed Sept. 29, 2014) (same challenge, but for coal mine in New Mexico).

[218] Wildearth Guardians v. Casamassa (U.S. Forest Serv., filed Jan. 2015) (challenging USFS's approval of Pawnee National Grassland Oil and Gas Leasing Analysis, and in particular its conclusion in the EIS that the contribution on climate change will be "negligible" and "inconsequential.")

[219] S. Coast Air Quality Mgmt. Dist. v. F.E.R.C., 621 F.3d 1085, 1093 (9th Cir. 2010)

[220] *Id.*

Responsible Growth was an unpublished opinion which contains almost no legal analysis, and does little to inform our discussion of whether and to what extent agencies must evaluate upstream and downstream emissions from pipelines.

It is likely that we will have a more definitive response to this question in the near future. The D.C. Circuit Court of Appeals is currently reviewing four cases regarding the scope of emissions that FERC must consider in NEPA reviews for LNG export terminals and connected natural gas pipelines, and the D.C. Circuit decisions will undoubtedly have a much more significant impact as judicial precedent. As in previous cases, FERC is arguing that it need not evaluate upstream and downstream emissions from such projects because they are not caused by the proposed action and too speculative to be analyzed in a meaningful way.[221]

With regards to causation, FERC argues that it has "no jurisdiction" over the production or consumption of the natural gas that will be exported as a result of its approvals, and thus its approvals are not the proximate cause of any induced production or consumption.[222] Like the agencies that unsuccessfully advanced this argument in the coal extraction cases, FERC cites *DOT v. Public Citizen* to support this argument.[223] And like the courts that reviewed this argument in the context of coal extraction, petitioners note that the respondents have misinterpreted the case law, "conflating lack of authority to directly regulate an effect… with lack of discretion regarding the action that will cause the effect."[224] Petitioners assert that, where an agency has discretion to withhold or modify an action, the agency must consider all reasonably foreseeable effects.[225]

With regards to foreseeability, FERC argues that increases in natural gas production and coal use (and the corresponding greenhouse gas emissions)_from export terminals and pipelines

[221] Brief of Respondent at 20-34, 41-46, Sierra Club v. Fed. Energy Regulatory Comm'n, No. 15-1133 (D.C. Cir. filed Jan. 12, 2016); Brief of Respondent at 31-40, Sierra Club v. Fed. Energy Regulatory Comm'n, No. 14-1249 (D.C. Cir. filed Sept. 30, 2015); Brief of Respondent at 31-49, Sierra Club and Galveston Baykeeper v. Fed. Energy Regulatory Comm'n, No. 14-1275 (D.C. Cir. filed July 17, 2015); Respondent's Opposition to Emergency Motion for Stay Pending Appeal at 12-16, EarthReports Inc., et al., v. Fed. Energy Regulatory Comm'n, No. 15-1127 (D.C. Cir. filed June 10, 2015).

[222] *See, e.g.*, Brief of Respondent at 30-31, Sierra Club v. Fed. Energy Regulatory Comm'n, No. 15-1133 (D.C. Cir. filed Jan. 12, 2016) (because these four cases involve the same plaintiffs, defendants, and basic fact patterns, the same arguments are advanced in the other briefs as well).

[223] *Id.*

[224] Reply Brief of Petitioners at 14-15, Sierra Club v. Fed. Energy Regulatory Comm'n, No. 15-1133 (D.C. Cir. filed Jan. 12, 2016) (citing Public Citizen as well as Citizens Against Rails-to-Trails, 267 F.3d 1144, 1151 (D.C. Cir. 2001), which held that the "touchstone of whether NEPA applies is discretion" and NEPA does not require analysis of indirect effects when "the agency does not have sufficient discretion to affect the outcome of its actions").

[225] *Id.* at 16.

are too speculative to evaluate because: (i) the amount, timing, and location of induced natural gas development is unknown,[226] and (ii) the amount of gas that will ultimately be exported is unknown.[227] In response, the petitioners have noted the annual capacity of natural gas exports that would be facilitated by these projects is known,[228] and there is evidence indicating that the utilization of the projects' full capacity is foreseeable.[229] Petitioners have also cited numerous studies and modeling tools that can be used to estimate induced production and consumption from pipeline development and the corresponding upstream and downstream emissions.[230]

The case law on coal extraction and transportation supports' the petitioners position with respect to FERC approvals of LNG export terminals and pipelines, and the petitioners have also presented sufficient studies to show that an analysis of upstream and downstream emissions is feasible in this context. If the D.C. Circuit were to hold in favor of FERC, it would be important for the court to explain precisely why natural gas pipelines and export terminals should be treated differently than coal rail lines and extraction projects.

C. Effects of Related Actions

As noted in section IV.B.3, just above, there is some overlap between the concept of "indirect impacts" and the "impacts of related actions" that must be reviewed under NEPA. Specifically, upstream and downstream emissions may also be conceptualized as the effects of "related actions" when such emissions occur as a result of other federal approvals in the fossil fuel supply chain that must also undergo NEPA review.

If a court concludes that such emissions should be evaluated as indirect effects, it may conclude that it is neither necessary nor prudent to determine whether those emissions also constitute the effects of a connected action (since this would entail issuing a much broader holding

[226] *See, e.g.*, Brief of Respondent at 22, Sierra Club v. Fed. Energy Regulatory Comm'n, No. 15-1133 (D.C. Cir. filed Jan. 12, 2016).
[227] *Id.* at 21.
[228] Reply Brief of Petitioners at 13, Sierra Club v. Fed. Energy Regulatory Comm'n, No. 15-1133 (D.C. Cir. filed Jan. 12, 2016).
[229] *Id.* (noting that the companies proposing the LNG terminal have already entered into contracts for the majority of the projects' output).
[230] *Id.* at 5. These studies and tools are also listed in the Appendix.

which requires the agency to evaluate all reasonably foreseeable effects of the related actions).[231] But if a court concludes that certain upstream or downstream emissions are *not* indirect impacts, then the requirement to evaluate the impacts of related actions provides an alternate basis for concluding that an agency must evaluate upstream and/or downstream emissions in its NEPA review.

This requirement to evaluate related actions in a single NEPA review is often referred to as a rule prohibiting the "segmentation" of actions and their environmental impacts. As noted by the D.C. Circuit Court of Appeals, the 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 collectively have a substantial impact."[232] Similarly, the Ninth Circuit has noted 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."[233]

The regulations identify three types of related actions that my warrant consideration in a single NEPA review: related actions, cumulative actions, and similar actions. This section will briefly review the case law on each type of action and how the judicial standards might be applied in the context of fossil fuel-related approvals.

1. Connected Actions

The NEPA regulations specify that agencies should conduct a joint review of connected actions, which are "closely related and therefore should be discussed in the same impact statements." These include actions that "automatically trigger" other actions which may require EISs, actions that "cannot or will not proceed unless other actions are taken previously or simultaneously," and actions that are "interdependent parts of a larger action and depend on the

[231] *See* Dine Citizens Against Ruining Our Env't v. United States Office of Surface Mining Reclamation & Enf't, 82 F. Supp. 3d 1201, 1212 (D. Colo. 2015), appeal dismissed (Aug. 18, 2015) ("Because I conclude that the combustion-related impacts are "indirect effects of the proposed action," I find it unnecessary to reach the parties' arguments relating to whether or not the continued operation of the Four Corners Power Plant is a "connected action.""); *Valley Forge Ins. Co. v. Health Care Mgmt. Partners, Ltd.*, 616 F.3d 1086, 1094 (10th Cir.2010) ("Judicial restraint ... means answering only the question we must, not those we can").

[232] Delaware Riverkeeper Network v. F.E.R.C., 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).

[233] Thomas v. Peterson, 753 F.2d 754, 761 (9th Cir. 1984).

larger action for their justification."[234] Courts have interpreted these regulations as imposing a mandatory obligation on agencies to conduct a joint review of actions that either have "no independent purpose or utility"[235] 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.[236]

Courts will frequently find that two actions are connected when one action involves the development of access roads or other infrastructure that are necessary to proceed with the other action. In *Thomas v. Peterson*, a Ninth Circuit case from 1985, the construction of a timber access road and the approval of a timber harvest were connected actions that must be reviewed together, because "it would be irrational to build the road and then not sell the timber to which the road was built to provide access."[237] Notably, the court rejected USFS's argument that "sales are too uncertain and too far in the future for their impacts to be analyzed along with that of the road," noting that "[t]his comes close to saying that building the road now is itself irrational… if the sales are sufficiently certain to justify construction of the road, then they are sufficiently certain for their environmental impacts to be analyzed along with those of the road."[238] Similarly, in *Sierra Club v. US*, a federal district court in Colorado found that a proposed easement for a mine access road and the operation of a mine were connected actions because they were "inextricably linked."[239] "But for the road, the mining company could not access the mine site; absent the mine, there is no independent utility for the access road."[240]

Connected actions may also include activities that are part of a larger whole. For example, in *Blue Ocean Pres. Society v. Watkins*, the district court in Hawaii held that four phases of geothermal energy development were sufficiently connected to require evaluation in the same EIS. The four stages were: (1) a geothermal resource assessment program, (2) a deep water cable program, (3) a geothermal verification and characterization program, and (4) construction of a geothermal plant. The court held that the first three stages lacked independent utility, were all

[234] 40 C.F.R. § 1508.25(a)(1).
[235] Custer Cty. Action Ass'n v. Garvey, 256 F.3d 1024, 1037 (10th Cir. 2001).
[236] Trout Unlimited v. Morton, 509 F.2d 1276, 1285 (9th Cir. 1974).
[237] Thomas v. Peterson, 753 F.2d 754, 759 (9th Cir. 1985)
[238] *Id.* at 760. *See also* Save the Yaak Comm. v. Block, 840 F.2d 714, 719-20 (9th Cir. 1988) (Road reconstruction and timber harvest were connected actions within the meaning of section 1508.25(a)(1)); Alpine Lakes Prot. Soc. v. U.S. Forest Serv., 838 F. Supp. 478 (W.D. Wash. 1993) (access road permit and timber management activities were connected actions).
[239] Sierra Club v. United States, 255 F. Supp. 2d 1177, 1184 (D. Colo. 2002).
[240] *Id.*

intended to support the final phase of the project, and were therefore "connected actions" within the meaning of NEPA.[241]

Most notably for the purposes of this paper, in *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.[242] In contrast, the Tenth Circuit in *Wilderness Workshop v. U.S. Bureau of Land Management* concluded that the authorization of a natural gas pipeline and "future natural gas 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.[243] (Notably, the decision in *Wilderness Workshop* did not discuss whether the effects of future natural gas development should be discussed as indirect or cumulative impacts).

Applying these standards, one could argue that various phases of fossil fuel development are "connected actions" that require a programmatic EA or EIS if there are multiple approvals that trigger NEPA review occurring during roughly the same period. This argument could be made even in the context of different types of approvals conducted by different agencies—for example, the approval of a coal lease or mining plan and the approval of a rail line that would service those mines may constitute "connected actions" that lack independent utility and should thus be reviewed in a single NEPA document.[244] However, if otherwise connected activities are not federal actions subject to NEPA, then the proper approach would be to analyze the emissions from non-federal activities as indirect effects of a federal action. It may also be the case that there are multiple federal approvals involved but these approvals will occur at different times, making it difficult or impossible for an agency to evaluate them in the same EA or EIS. In that case, it would also make sense to discuss potential emissions from future stages of fossil fuel development as indirect effects that may occur further down the road.

[241] Blue Ocean Pres. Soc. v. Watkins, 754 F. Supp. 1450, 1459 (D. Haw. 1991).
[242] Delaware Riverkeeper Network v. F.E.R.C., 753 F.3d 1304, 1308-09 (D.C. Cir. 2014).
[243] Wilderness Workshop v. U.S. Bureau of Land Mgmt., 531 F.3d 1220, 1231 (10th Cir. 2008)
[244] There is a clear analogy to the cases involving access roads and connected activities—but for the rail line, the mining company could not transport its coal to end-users or markets; absent the mine, there is no independent utility to the rail line.

2. Cumulative Actions

The NEPA regulations also require a joint review of federal actions that "have cumulatively significant impacts and should therefore be discussed in the same impact statement."[245] This is distinct from the requirement to review the "cumulative effects" of a single action, which entails an assessment of the "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions," regardless of whether these actions are undertaken by a governmental or non-governmental actions.[246] The circumstances under which an agency must evaluate cumulative *actions* in the same EIS or EA are narrower—this requirement only applies when there are two or more federal "actions" subject to NEPA with cumulative effects—but the scope of the analysis is broader –the agency must conduct a complete review for each of the cumulative actions.

The cases in which courts have compelled consideration of cumulative actions in a single EA or EIS typically involve actions that have something in common—e.g., they are very similar actions or they are part of integrated infrastructure. For example, in *N. Cascades Conservation Council v. USFS* , three off-road vehicle trail construction projects were considered cumulative actions that must be evaluated in the same EA. A district court in Washington explained that these were not connected actions, because "the success or failure of one or all of the projects is not dependent upon the completion of the others" but they were part of a larger trail system with cumulatively significant effects and thus met the regulatory definition for "cumulative actions."[247] Similarly, in *Alpine Lakes Protection Society v. USFS*, permit applications for seven access roads in the same region were considered cumulative actions.[248] Finally, in *Blue Mountains Biodiversity Project v. Blackwood*, the Ninth Circuit concluded that multiple salvage logging projects that would affect the same region were cumulative actions. There, the court noted that a joint review should

[245] 40 C.F.R. § 1508.25(a)(2).
[246] 40 C.F.R. § 1508.7
[247] N. Cascades Conservation Council v. U.S. Forest Serv., 98 F. Supp. 2d 1193, 1199 (W.D. Wash. 1999).
[248] Alpine Lakes Prot. Soc. v. U.S. Forest Serv., 838 F. Supp. 478, 484 (W.D. Wash. 1993) ("The failure to even consider whether there is a potential for cumulative impact on any aspect of the environment except wildlife species as a result of these projects cannot be characterized as a 'truly informed exercise of discretion', nor can it be said to amount to the requisite 'hard look' at the environmental consequences of granting the permits in question.")

be conducted when the record raises "substantial questions" about whether there will be "significant environmental impacts" from the projects when reviewed in the aggregate.[249]

In the seminal case of *Kleppe v. Sierra Club*, the Supreme Court explained how this requirement would apply to multiple decisions about leasing coal from federal lands:

> 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 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.[250]

In that case, the court ultimately deferred to the federal government's decisions about *how* to go about conducting programmatic reviews of coal mining, and in particular the government's decision that "the appropriate scope of comprehensive statements should be based on basins, drainage areas, and other factors."[251] Based on these factors, it held that the federal government's decision not to prepare a PEIS for the entire Great Plains Region was acceptable. But the court's description of the basic rationale of programmatic reviews remains relevant—NEPA requires comprehensive environmental reviews that account for the cumulative and synergistic environmental impacts on a particular resource, and in the context of global climate change, that resource is the global atmosphere.

Courts may also defer to an agency's decision *not* to conduct a joint EIS for approvals that do not occur in the same time frame. For example, in *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.* (9th Cir. 2004), the court held that four timber sales that would potentially have cumulative effects on did not require a single EIS, because the approvals were scheduled to occur incrementally, instead of being approved together simultaneously. Due to uncertainties about the future approvals, the court held that it was appropriate to BLM's judgment about whether to prepare a single EIS.[252]

Any federal decision that authorizes the extraction or transportation of fossil fuels could be viewed as having a cumulatively significant effect on greenhouse gas emissions, and thus these

[249] Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208, 1212 (9th Cir. 1998).
[250] Kleppe v. Sierra Club, 427 U.S. 390, 409-410 (1976) (citations omitted).
[251] *Id.* at 413-14.
[252] Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt., 387 F.3d 989, 1000 (9th Cir. 2004).

decisions could qualify as "cumulative actions" requiring a joint NEPA review if they are scheduled to occur during approximately the same time frame. However, courts have only enforced this requirement in the context of projects that are similar in nature and located in the same geographic region. There is not yet any case law on how this requirement might be interpreted in the context of projects with cumulatively significant greenhouse gas emissions, but it is possible that they would depart from the focus on geographic proximity (since this is irrelevant in the context of fossil fuels). Moreover, there is not a well-established threshold for what constitutes "significant" greenhouse gas emissions in the context of NEPA reviews. Agencies almost never conclude that greenhouse gas emissions are significant, but they do frequently state that such emissions are insignificant because they represent only a small portion of U.S. or total emissions.[253] In its revised draft guidance, CEQ has stated that such statements are not helpful, but CEQ has not specified a significance threshold for greenhouse gas emissions.

3. Similar Actions

The NEPA regulations specify 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." The regulations further note that an agency "should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternative to such actions is to treat them in a single impact statement."[254]

The courts have concluded that this language does not impose a clear mandate on agencies to evaluate similar actions in a single EA or EIS. The Ninth Circuit has explained:

> "For the first two categories [connected and cumulative actions], the agency is told that it "should" analyze them in a single impact statement, which we interpret as a mandatory requirement. For "similar" actions, on the other hand, we held that an agency should be accorded more deference in deciding whether to analyze such actions together."[255]

[253] *See* Wentz et al., *supra* note 17.
[254] 40 C.F.R. § 1508.25(a)(3).
[255] Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt., 387 F.3d 989, 1001 (9th Cir. 2004) (citing *Earth Island Institute v. United States Forest Service*, 351 F.3d 1291(9th Cir.2003)).

Thus, courts generally defer to an agency's decision about how to evaluate similar actions.[256]

In light of the deference shown to agencies, it is unlikely that this provision could be used to compel a programmatic review of similar fossil fuel projects. But agencies can certainly refer to this provision to justify decisions to evaluate similar projects in the same EIS or EA.

4. Concluding Remarks on Related Actions

The caw law on related actions suggests that there are circumstances in which the requirements to evaluate "connected" and "cumulative" actions together could be used to compel the preparation of a joint or programmatic NEPA review to evaluate a broader scope of greenhouse gas emissions associated with the development of fossil fuels. But these requirements only apply when there are two or more federal actions occurring simultaneously—otherwise, it makes more sense to rely on the indirect effects requirement to compel consideration of upstream and downstream emissions. There is also a good chance that courts will defer to agency decisions about when and how to prepare programmatic EISs for coal, oil and gas development, except in circumstances where the segmentation of the NEPA review is so obvious and egregious that the agency cannot provide any reasonable explanation for its decision. FERC's decision to conduct separate NEPA reviews for different segments of a natural gas pipeline is one example of such a situation. But if an agency is reviewing proposals that are not physically connected (e.g., coal mining applications) or that are different in nature (e.g., a coal mining application and a coal railway), the courts may very well defer to the agency's decision about how to structure the NEPA review process.

V. RECOMMENDATIONS

Federal agencies can improve the informational basis for their decision-making and avoid litigation by incorporating projections of upstream and downstream greenhouse gas emissions in the EISs and EAs prepared for fossil fuel management decisions. These recommendations describe how a federal agency can conduct a greenhouse gas assessment that will satisfy the

[256] Earth Island Inst. v. U.S. Forest Serv., 351 F.3d 1291, 1306 (9th Cir. 2003) (USFS not required to evaluate two fire restoration projects as similar actions); Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt., 387 F.3d 989, 1001 (9th Cir. 2004) (BLM not required to evaluate four timber sales as similar actions in same EIS, despite many similarities).

requirements of NEPA and provide useful information for decision-makers and the public. They could also be used as a guide for advocates and courts to establish how federal agencies can and should evaluate greenhouse gas emissions in the context of these projects.

A. Fossil Fuel Extraction

When preparing an EIS or EA for any federal action that involves the extraction of fossil fuels, the agency should acknowledge that downstream emissions from the transportation, processing and combustion of the resource are indirect effects of the action. If it is possible to estimate the amount of the resource that may be extracted, then the agency's disclosure of downstream emissions should be quantified. At minimum, the agency should estimate downstream emissions from combustion by multiplying the amount of the resource to be extracted by the CO2 emission factor for the fuel.[257] The agency can refer to the resources described in Appendix A to conduct a more detailed analysis of end use emissions that accounts for different combustion technologies and non-combustion applications.

The resources in Appendix A can also be used to estimate emissions from the transportation and processing of the resource. If the precise route or method is unknown, the agency should refer to national or regional averages in order to forecast potential emissions from transportation and processing. For example, the agency can refer to the estimates of average life-cycle emissions for various U.S. fossil fuels to provide decision-makers and the public with a reasonable estimate of potential direct and indirect greenhouse gas emissions, accompanied by a qualitative explanation of how the actual emissions for the proposed action may differ from these averages. The agency can also use a range of estimates to account for uncertainty in this analysis. To the extent possible, the emissions inventory should specify the amount of emissions from different activities within the supply chain, as well as total direct and indirect emissions (see Table, below). It should also specify both annual emissions and total emissions over the lifetime of the project. It should also include emissions from activities that occur in other jurisdictions.[258]

[257] ENERGY INFO. ADMIN., ELECTRIC POWER ANNUAL 2014, Appendix, Table A.3: Carbon Dioxide Uncontrolled Emission Factors (Feb. 2016).

[258] It would be illogical to ignore greenhouse gas emissions in other jurisdictions, since a ton of CO_{2e} has the same effect regardless of where it is emitted.

Table: Example Greenhouse Gas Emissions Inventory for Oil and Gas Leasing[259]

Oil & Gas Activity (based on 30 wells)	**Estimated Emissions (Metric Tons CO2e)**
Exploration	7,495
Production	58,214
Transportation of Crude	2,161
Refining	28,286
Transportation of Refined	868
Product End Use	268,312
TOTAL	**365,336**

The inventory should be accompanied by an explanation of what each activity entails, and what assumptions underpin the greenhouse gas emission estimates (e.g., for end-use estimates, the agency should specify the amount of fossil fuel to be produced and the emissions factor or other protocol used to calculate the emissions from combustion and other end uses).[260]

This inventory of downstream greenhouse gas emissions could be supplemented by a market analysis of how the predicted increase in the supply of fossil fuels will affect prices and consumption vis-à-vis alternative fuel sources. The market analysis should not be used as a substitute for a complete inventory of downstream emissions. Rather, it should serve as a tool for determining whether the proposed action will displace the production and consumption of other fuel sources, thus resulting in a net increase in greenhouse gas emissions that may be less than the gross emissions from downstream processing, transportation and consumption. In other words, the market analysis should inform the agency's understanding of the extent to which the project will actually increase greenhouse gas emissions as compared with the no action baseline.

[259] Adapted from: U.S. FOREST SERV., RECORD OF DECISION AND FINAL ENVIRONMENTAL IMPACT STATEMENT, OIL AND GAS LEASING ANALYSIS, FISHLAKE NATIONAL FOREST 169 (Aug. 2013) (Table 3.12-7).

[260] For an example of a qualitative description accompanying the quantitative estimates, see *id.*, Appendix E.

When conducting such an analysis, agencies should refer to the most current data on energy prices and markets, and should account for the possibility that the produced fossil fuels will displace the use of renewable energy and energy efficiency. The analysis should also account for the effect of existing and foreseeable regulations on fossil fuel fired-power plants, and whether such regulations may reduce domestic consumption and increase exports of the produced fuel. Finally, the agency should not only evaluate the extent to which the project will increase the *rate* of extraction and consumption in its market analysis, but also whether the project will increase the *duration* of extraction and consumption in the long-term. Tools for conducting this analysis are described in Appendix A.

If the agency forgoes a market analysis, it would be appropriate to include a statement acknowledging that the [net/incremental] impact of the proposed action on greenhouse gas emissions may be smaller than the gross emissions listed in the inventory, since the action may displace production of fossil fuels from other sources. But under no circumstances should the agency state that the project will have no effect on emissions as compared with the no action alternative because there are "perfect substitutes" for the produced fuel. As discussed throughout this paper, such an assertion is factually wrong and has been rejected by the courts.

As noted above, DOI is planning to prepare a programmatic EIS for the coal leasing program. In subsequent EISs for more specific development, leasing and mining approvals, agencies can refer back to this programmatic EIS to inform their greenhouse gas analysis. Any information on emissions gathered in the meantime can help inform the analysis in the programmatic EIS. The DOI should also consider conducting a programmatic EIS for oil and gas leasing that also accounts for the full scope of emissions impacts. In the absence of such a programmatic analysis DOI, BOEM and other agencies should nonetheless conduct analyses for lease plans, lease sales and other authorizations for extraction.

Finally, after compiling a complete inventory of greenhouse gas emissions, the agency should consider how these emissions will interfere with national and state climate goals, consistent their obligations under the NEPA implementing regulations.[261] If the agency is conducting a cost-

[261] *See* 40 C.F.R. § 1502.16(c) (requiring disclosure of "[p]ossible conflicts between the proposed action and the objectives of federal, regional, state, and local… land use plans, policies, and controls"); 40 C.F.R. § 1506.2(d) (where there is an inconsistency with state or local plans, the statement "should describe the extent to which the agency would reconcile its

benefit analysis, it should also assign a value to greenhouse gas emissions using the federal social cost of carbon protocol,[262] and the values used by the federal government to calculate the social costs of methane and nitrous oxide.[263]

B. Fossil Fuel Transportation Infrastructure

When preparing an EIS or EA for any infrastructure intended to transport fossil fuels, the agency should acknowledge that the indirect effects of the project will include upstream and downstream emissions from the production, processing, and consumption of the resource (and in some instances, from other stages of transportation). When the amount of fossil fuels that will be transported by the proposed infrastructure has been estimated, the agency should also include quantitative estimates of upstream and downstream emissions in its greenhouse gas emissions inventory. In other words, the inventory should include a lifecycle assessment of greenhouse gas emissions from the transported fuel. The inventory should be broken down into emissions from different activities within the supply chain, it should specify both annual emissions and total emissions over the lifetime of the project, and it should include emissions from activities in other jurisdictions.

The agency can refer to the resources in Appendix B to obtain estimates of average lifecycle emissions for different fuel sources in different contexts (e.g., lifecycle emissions for natural gas exports). If the agency believes that the average emissions estimates from other studies are not indicative of the emissions that would occur in the context of the particular action being reviewed,

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proposed action with the plan or law"). *See also* Revised Draft Guidance, 79 Fed. Reg. at 77,826 (instructing agencies to provide a frame of reference for decision-makers by disclosing the extent to which greenhouse gas emissions are consistent with the goals of federal, state, tribal and local climate change policies).

[262] *The Social Cost of Carbon,* ENVTL. PROTECTION AGENCY, http://www3.epa.gov/climatechange/EPAactivities/economics/scc.html (last visited March 14, 2016). *See also* High Country Conservation Advocates v. United States Forest Serv., 52 F. Supp. 3d 1174, 1193 (D. Colo. 2014) (requiring agency to use social cost of carbon protocol when calculating costs and benefits of action that would generate greenhouse gas emissions); Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1217 (9th Cir. 2008) (holding that NEPA requires agencies to analyze the effects of its actions on global climate change).

[263] For the values currently utilized by the Envtl. Protection Agency to calculate the social cost of methane and nitrous oxide emissions, see Alex L. Marten et al., *Incremental CH_4 and N_2O Mitigation Benefits Consistent with the US Government's SC-CO_2 estimates*, 15 CLIMATE POLICY 272 (2015). This toll has been used by the Envtl. Protection Agency in previous rulemakings. *See* EPA, REGULATORY IMPACT ANALYSIS OF THE PROPOSED EMISSION STANDARDS FOR NEW AND MODIFIED SOURCES IN THE OIL AND NATURAL GAS SECTOR 4-14 (2015); EPA, REGULATORY IMPACT ANALYSIS FOR THE PROPOSED REVISIONS TO THE EMISSION GUIDELINES FOR EXISTING SOURCES AND SUPPLEMENTAL PROPOSED NEW SOURCE PERFORMANCE STANDARDS IN THE MUNICIPAL SOLID WASTE LANDFILLS SECTOR 4-10 – 4-14 (2015).

perhaps due to differences in the location of extraction, transportation route or the potential end use, the agency can either conduct its own quantitative emissions assessment, or cite the figures from other studies and provide a qualitative explanation of how emissions may differ for this particular project. Such an analysis would be more helpful to decision-makers and the public than, for example, a statement that upstream and downstream emissions are impossible to quantify as a result of uncertainties.

Appendix A also contains tools that can be used to evaluate the impact of pipelines and other transportation infrastructure on the production and consumption of fossil fuels and other energy sources. As with extraction projects, the analysis of market impacts should not be used as a substitute for the emissions inventory described above. Rather, it should serve as a tool for determining the extent to which the project will actually increase emissions as compared with the no-action baseline. The analysis should reflect any increase in the rate or duration of extraction and consumption of the transported resource.

As noted above, if the agency forgoes a market analysis, it would also be appropriate to include a qualitative statement noting that the incremental impact of the project on greenhouse gas emissions will likely be smaller than the total emissions listed in the inventory, since some of the fossil fuels will be produced and consumed even if the proposal is not approved. The agency should also evaluate consistency with federal, tribal, state and local climate policies, and use the appropriate tools to assign a value to greenhouse gas emissions in any cost benefit analysis.

Finally, FERC or DOE should consider conducting a programmatic EIS to evaluate the cumulative impacts of natural gas pipeline and export approvals, which includes an assessment of upstream and downstream greenhouse gas emissions. This programmatic EIS could be used to facilitate an analysis of greenhouse gas emissions in the context of specific projects.

CONCLUSION

Federal agencies have a legal obligation to consider indirect effects, including upstream and downstream greenhouse gas emissions, when conducting NEPA reviews of fossil fuel extraction and transportation projects. By conducting a comprehensive greenhouse gas assessment like that described in Section 6, federal agencies can avoid costly lawsuits, provide valuable information to decision-makers and the public, and ensure that their decisions are in harmony with national

climate goals and the public interest. Some agencies have already begun to conduct this type of analysis in their EISs, in large part due to the judicial intervention described above. It is likely that the public and the courts will continue to play a key role in enforcing NEPA's indirect effects requirement in this context, at least in the near future. Thus, it will be important for interested stakeholders to continue to monitor, comment on, and challenge NEPA reviews as necessary to compel consideration of upstream and downstream emissions.

APPENDIX: ESTIMATING LIFE-CYCLE GREENHOUSE GAS EMISSIONS FROM FOSSIL FUELS

There are a variety of tools that can be used to estimate the indirect greenhouse gas emissions from fossil fuel production and transportation projects. Table A-1 lists the protocols that can be used to identify the scope of upstream and downstream activities and physical sources that should be included in the analysis. Table A-2 lists models that can be used to estimate: (i) upstream and downstream greenhouse gas emissions, and (ii) effects of fossil fuel extraction and transportation projects on supply and demand. Table A-3 lists some of the life-cycle assessments (LCAs) and other studies of greenhouse gas emissions from fossil fuel production, transportation, and consumption in the United States.

Table A-1: Protocols and Models for Identifying and Estimating Greenhouse Gas Emissions from Fossil Fuel Production, Transport, Processing, and End Use

Resource	Description
Greenhouse Gas Protocol[264]	The Greenhouse Gas Protocol, developed by the World Resources Institute (WRI) and World Business Council on Sustainable Development (WBSCD), is the most widely used international accounting tool for identifying, quantifying, and managing greenhouse gas emissions. It serves as a foundation for other greenhouse gas reporting standards, such as those outlined by the Climate Registry (see below). The protocol separates emissions into three scopes. Scope 3 emissions include downstream and upstream emissions that occur as a consequence of projects but are generated from sources owned or controlled by other entities in the value chain (e.g., emissions from the extraction, production, and transportation of fuels purchased by a business). The main protocol is accompanied by several guidance documents and methodologies, including: • **Scope 3 Calculation Guidance** - This includes targeted guidance on calculating Scope 3 emissions for fuel and energy-related activities. This guidance primarily discusses how entities should calculate upstream emissions of purchased fossil fuels, such as emissions from mining, transport, and processing. • **Draft Framework Methodology: Calculating and Reporting the**

[264] *Greenhouse Gas Protocol*, WORLD RESOURCES INSTITUTE (WRI) AND WORLD BUSINESS COUNCIL ON SUSTAINABLE DEVELOPMENT (WBCSD), http://www.ghgprotocol.org/ (last visited March 11, 2016).

	Potential GHG Emissions from Fossil Fuel Reserves - This is a supplemental tool for quantifying emissions from fossil fuel reserves. It concentrates on the primary routes through which the carbon stored in those reserves is released into the atmosphere (e.g., fuel extraction and processing; flaring, fugitive, and venting emissions combustion of fuel products by consumers).
Oil and Gas Production (O&GP) Protocol[265]	The O&GP Protocol was designed as an appendix to the Climate Registry's General Reporting Protocol (which encourages the consideration of Scope 3 emissions in accordance with the Greenhouse Gas Protocol standards, noted above). The O&GP Protocol specifies a methodology for calculating emissions from the production and transportation of oil and gas. Some aspects of processing are also covered. It does not address certain downstream activities. Specifically, for oil, it does not address refining, transportation, storage and distribution of petroleum products. For natural gas, it does not address emissions from transmission, storage, and distribution. It does not address emissions from combustion or end-use of any fuel.
Greenhouse Gas Reporting Rule[266]	The U.S. Environmental Protection Agency (EPA)'s Greenhouse Gas reporting rule outlines requirements for reporting emissions from certain source categories. The rule describes: a. The scope of emissions to be reported b. The methodology used to report emissions from those sources. c. Procedures for estimating missing data Specific requirements are outlined for the following source categories: a. Subpart C – General Stationary Fuel Combustion Sources b. Subpart D – Electricity Generation c. Subpart W – Petroleum and Natural Gas Systems d. Subpart Y – Petroleum Refineries e. Subpart FF – Underground Coal Mines f. Subpart MM- Suppliers of Petroleum Products g. Subpart NN – Suppliers of Natural Gas and Natural Gas Liquids While the rule only provides instructions on how to calculate *direct* emissions from each category, it could be referred to for the purpose of calculating *indirect emissions* associated with specific upstream or downstream activities.

[265] *Oil and Gas Production Protocol*, THE CLIMATE REGISTRY, http://www.theclimateregistry.org/wp-content/uploads/2014/12/Final-OGP-Protocol.pdf (last visited March 11, 2016).
[266] 40 C.F.R. Pt. 98 ("Mandatory Greenhouse Gas Reporting").

Table A-2: Models to Calculate Greenhouse Gas Emissions and Impacts on Fossil Fuel Supply and Demand

Resource	Description
National Energy Modeling System (NEMS)[267]	This tool, developed by the U.S. Environmental Information Administration (EIA), can be used to: (i) forecast the impacts of fossil fuel extraction and transportation projects on supply and demand, and (ii) quantify the corresponding environmental impacts, including greenhouse gas emissions.
Upstream Dashboard[268]	The National Energy Technology Laboratory (NETL) developed this tool to calculate upstream emissions from fossil fuels and other energy feedstocks. It is an excel-based tool, which breaks down energy production and emissions into the lifecycle stages of extraction and transportation, and allows the user to customize the analysis by changing options such as the mode of transportation, distance the raw material travels, and the sub-type of fuel.
Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET)[269]	GREET is a model that can be used to estimate both upstream and downstream emissions of different fossil fuels, including emissions from the extraction, processing, transportation and combustion (both stationary and mobile source) of petroleum, natural gas, and coal.
Oil Production GHG Emissions Estimator (OPGEE)[270]	The OPGEE is an engineering-based LCA tool for the measurement of greenhouse gas emissions from the production, processing, and transport of crude petroleum. The system boundary of OPGEE extends from initial exploration to the refinery entrance gate.
Integrated North American Power, Coal, and World Gas Model[271]	This model, also known as the "World Gas Model," can be used to estimate both price and quantity impacts from natural gas supply and transportation projects (and as such, can be paired with other emissions modeling tools to estimate emissions associated with increases in natural gas production and consumption).

[267] U.S. ENERGY INFO. ADMIN., THE NATIONAL ENERGY MODELING SYSTEM: AN OVERVIEW (2009).

[268] *New Tool Yields Custom Environmental Data for Lifecycle Analysis,* DEPT. OF ENERGY (Sept. 10, 2012), http://energy.gov/fe/articles/new-tool-yields-custom-environmental-data-lifecycle-analysis (last visited March 11, 2016).

[269] *Greet Model,* ARGONNE NATIONAL LABORATORY, https://greet.es.anl.gov (last visited March 11, 2016).

[270] *OPGEE: The Oil Production Greenhouse Gas Emissions Estimator*, STANFORD SCHOOL OF EARTH, ENERGY & ENVIRONMENTAL SCIENCES, https://pangea.stanford.edu/researchgroups/eao/research/opgee-oil-production-greenhouse-gas-emissions-estimator (last visited March 11, 2016).

[271] *Natural Gas Models,* DELOITTE MARKETPLACE LLC, https://www.deloittemarketpoint.com/industries/natural-gas/world-gas-model (last visited March 11, 2016).

Table A-3: Life-cycle Assessment of Greenhouse Gas Emissions from Fossil Fuels

Resource	Fossil Fuels	Stages
Jaramillo et al. (2007)[272]	Coal, natural gas (including LNG and SNG)	Extraction, processing, transmission, consumption. processing, transmission, consumption. processing, transmission, consumption. For LNG, includes liquefaction and regasification.
Burnham et al. (2012)[273]	Natural gas (including shale), coal, petroleum	Extraction, processing, transmission and storage, distribution, consumption. (unclear whether coal transport was accounted for)
Congressional Research Service (2015)[274]	Coal, natural Gas	Extraction, processing, transport, combustion
US DOE, Natural Gas Production and Use (2014)[275]	Coal, natural Gas	Extraction, processing, transport, combustion
US DOE, Natural Gas Exports (2014)[276]	Coal, natural gas	Extraction, processing, transport, export, combustion
Abrahams et al. (2014)[277]	Natural Gas (LNG Exports)	Extraction, processing, pipeline transportation to liquefaction facility, liquefaction, shipping, regasification, distribution, combustion.
Jiang et al. (2011)[278]	Natural gas (Marcellus	Exploration, extraction, processing,

[272] Paulina Jaramillo et al., *Comparative Life-Cycle Air Emissions of Coal, Domestic Natural Gas, LNG, and SNG for Electricity Generation,* 41 ENVIRON. SCI. TECHNOL. 6290 (2007).

[273] Andrew Burnham et al., *Life-Cycle Greenhouse Gas Emissions of Shale Gas, Natural Gas, Coal, and Petroleum,* 46(2) ENVIRON. SCI. TECHNOL. 619 (2012)

[274] RICHARD K. LATTANZIO, CONGRESSIONAL RESEARCH SERVICE, LIFE-CYCLE GREENHOUSE GAS ASSESSMENT OF COAL AND NATURAL GAS IN THE POWER SECTOR (June 26, 2015).

[275] U.S. DEPARTMENT OF ENERGY, NATIONAL ENERGY TECHNOLOGY LABORATORY, LIFE CYCLE ANALYSIS OF NATURAL GAS EXTRACTION AND POWER GENERATION, DOE/NETL-2014/1646, May 29, 2014 (although the report focuses on natural gas LCA, it also includes coal LCA for the purpose of comparison)

[276] U.S. DEPARTMENT OF ENERGY, NATIONAL ENERGY TECHNOLOGY LABORATORY , LIFE CYCLE GREENHOUSE GAS PERSPECTIVE ON EXPORTING LIQUEFIED NATURAL GAS FROM THE UNITED STATES, DOE/NETL-2014/1649 (May 29, 2014) (although the focus is on natural gas, coal is also evaluated for comparison)

[277] Leslie S. Abrahams et al., *Life Cycle Greenhouse Gas Emissions from U.S. Liquefied Natural Gas Exports: Implications for End Uses*, 49 ENVIRONMENTAL SCIENCE & TECHNOLOGY 3237 (2014).

[278] Mohan Jiang et al., *Life Cycle Greenhouse Gas Emissions of Marcellus Shale Gas,* 6(3) ENVIRONMENTAL RESEARCH LETTERS 034014 (2011).

	Shale)	transmission, distribution, combustion
World Resources Institute (2013)[279]	Natural gas	Pre-production, production, processing, transmission, combustion
Weber & Clavin (2012)[280]	Natural gas (shale gas)	Preproduction, production/processing, transmission
Zavala-Araiza et al. (2015)[281]	Oil, gas (supply chain methane emissions)	Production, transmission, processing
Epstein et al. (2011)[282]	Coal	Extraction, transport, processing, combustion

[279] JAMES BRADBURY ET AL., WORLD RESOURCES INSTITUTE, CLEARING THE AIR: REDUCING UPSTREAM GREENHOUSE GAS EMISSIONS FROM U.S. NATURAL GAS SYSTEMS (2013).

[280] Christopher L. Weber & Christopher Clavin, *Life Cycle Carbon Footprint of Shale Gas: Review of Evidence and Implications,* 46(11) ENVIRON. SCI. TECHNOL. 5688 (2012).

[281] Daniel Zavala-Araiza et al., *Reconciling Divergent Estimates of Oil and Gas Methane Emissions,* PNAS EARLY EDITION DOI 10.1073 (Nov. 2015), http://www.pnas.org/content/early/2015/12/03/1522126112.abstract.

[282] Paul R. Epstein et al., *Full Cost Accounting for the Life Cycle of Coal*, 1219 ECOLOGICAL ECONOMICS REVIEWS 73 (2011).