UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

CERTIFICATION OF NEW INTERSTATE NATURAL GAS FACILITIES	))))	DOCKET NO. PL18-1-000

COMMENTS OF THE INSTITUTE FOR POLICY INTEGRITY AT NEW YORK UNIVERSITY SCHOOL OF LAW

Pursuant to the Federal Energy Regulation Commission's ("Commission" or "FERC") Notice of Inquiry ("NOI") in the above captioned proceeding,[1] the Institute for Policy Integrity ("Policy Integrity") at New York University School of Law[2] respectfully submits the following comments. Policy Integrity appreciates the Commission's request for information and stakeholder perspectives on whether, and if so how, to revise its currently effective policy statement on the certification of new natural gas transportation facilities ("Policy Statement").[3] Policy Integrity is a non-partisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy.

These comments address the Commission's evaluation of a proposed projects' environmental impacts pursuant to the National Environmental Policy Act ("NEPA"), as well as its methodology for determining whether there is a need for a proposed project pursuant to the

[1] *Certification of New Interstate Natural Gas Pipeline Facilities*, Notice of Inquiry, 163 FERC ¶ 61,042 (2018) [hereinafter "*Policy Statement NOI*"].
[2] This document does not purport to present New York University School of Law's views, if any.
[3] *Certification of New Interstate Natural Gas Pipeline Facilities*, 88 FERC ¶ 61,227 (1999), *clarified*, 90 FERC ¶ 61,128 (1999), *further clarified*, 92 FERC ¶ 61,094 (2000) [hereinafter "*Policy Statement*"].

Natural Gas Act. In the nineteen years since FERC's existing Policy Statement was released, there have been significant advances in the understanding and measurement of climate change and other environmental effects of natural gas production, transportation, and consumption. These comments suggest clarifications and improvements to the Commission's NEPA and Natural Gas Act analysis that will better inform policymakers and the public about the environmental effects of proposed projects. Specifically:

- NEPA and the Natural Gas Act require analysis of direct and indirect (including upstream and downstream) emissions associated with potential projects.
    - The Commission should clarify that analysis of upstream and downstream emissions associated with potential projects is required pursuant to NEPA, in line with the weight of federal caselaw.
    - The Commission should incorporate environmental effects into its public convenience and necessity test pursuant to the Natural Gas Act.
    - The Commission's alternatives analysis under NEPA can and should better inform the Commission as it exercises its obligations decisions under the Natural Gas Act.
- The Commission should adopt a policy that it will quantify and monetize upstream and downstream greenhouse gas emissions in all NEPA and Natural Gas Act analyses, to the maximum extent feasible.
- The Commission should request that certificate applicants provide as much information as possible on the expected source, end use, and amount of natural gas to be transported through a proposed pipeline.
- Barring a more precise estimate based on project-specific data, the Commission should use default scenarios, available emission factor estimates, and, when possible, modeling to estimate greenhouse gas emissions; and
- The Commission should consider adopting a more holistic cost-benefit analysis framework for evaluating projects under the Natural Gas Act.

Each of these recommendations is discussed further below.

Contents

I. NEPA and the Natural Gas Act Require Analysis of Direct and Indirect (Including Upstream and Downstream) Emissions Associated with Potential Projects.

As the Commission reevaluates its Policy Statement, it has the opportunity to align its NEPA analysis with the weight of federal legal precedent finding that agencies must analyze the foreseeable direct and indirect greenhouse gas emissions associated with potential projects. Further, the environmental information gathered as part of the NEPA process is valuable because the Commission has the power to approve, amend, or deny projects on the basis of their environmental consequences. But to date, the Commission does not systematically incorporate environmental effects into its process for evaluating, approving, or denying certificates of public convenience and necessity under Section 7 of the Natural Gas Act. Instead, the Commission should adopt a policy to incorporate environmental consequences—including direct, upstream and downstream emissions—directly into the balancing test it uses when evaluating whether a project is required by the public convenience and necessity under the Natural Gas Act.

A. The Commission should clarify that analysis of direct and indirect emissions associated with potential projects is required pursuant to NEPA, in line with the weight of federal caselaw.

In its Policy Statement, FERC should clarify that analysis of upstream and downstream emissions associated with potential projects is required in order to comply with NEPA. A number of federal Courts of Appeals, as well as U.S. district courts, have held that NEPA requires analysis of reasonably foreseeable upstream and downstream emissions.[4]

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[4] *See, e.g., Sierra Club v. Fed. Energy Regulatory Comm'n*, 867 F.3d 1357, 1372 (D.C. Cir. 2017) ("Sabal Trail"); *WildEarth Guardians v. BLM*, 870 F.3d 1222, 1237-38 (10th Cir. 2017); *Mid States Coal. for Progress v. Surface Transp. Bd.,* 345 F.3d 520, 549-50 (8th Cir. 2003); *Montana Envtl. Info. Ctr. v. U.S. Office of Surface Mining*, 274 F. Supp. 3d 1074, 1090-91 (D. Mont. 2017); *San Juan Citizens Alliance et al v. BLM*, No. 16-cv-376 at *12-13 (D. N.M. June 14, 2018); *W. Org. of Res. Councils v. BLM*, 2018 WL 1475470 at *13 (D. Mont. March 26, 2018).

This legal precedent is consistent with NEPA and its implementing regulations, which require federal agencies to analyze foreseeable direct, indirect, and cumulative effects associated with their major actions and approvals.[5] Natural gas transportation facilities have direct, indirect, and cumulative effects on climate change. Direct effects include the climate consequences of the greenhouse pollution emitted by the construction and operation of the project, including methane leaks. Indirect effects include the climate consequences of both the upstream greenhouse pollution emitted by the extraction and processing of the natural gas before it enters the pipeline, and the downstream greenhouse pollution emitted by the combustion of the gas in power plants, industrial facilities, heating and cooking appliances, and other end uses. As discussed more below in Part IV.C on energy substitution analysis, approval of a new transportation project reduces the costs of supplying the gas to the market, which reduces the gas's market price to consumers, which increases consumers' demand for the gas, which increases the amounts of gas that producers are willing to supply and that consumers will want to combust. That increased willingness to supply and demand for combustion causes upstream and downstream greenhouse emissions.

Additionally, a new natural gas transportation project contributes cumulatively to the entire upstream emissions of the supply site and the downstream emissions of the combustion. In the Notice of Inquiry, FERC writes that under NEPA, cumulative effects include only incremental impacts added to other actions that "occur within the same geographic area and same time period in which the proposed project's impacts will occur."[6] For the purposes of climate analysis, the relevant geographic scope is the global atmosphere, and the relevant temporal scope is the reasonably foreseeable future. Courts have held that "[t]he impact of greenhouse gas

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[5] *See* 40 C.F.R. §§ 1508.7, 1508.8, 1508.25.
[6] *Policy Statement NOI,* 163 FERC ¶ 61,042 at P 11.

emissions on climate change is precisely the kind of cumulative impact analysis that NEPA requires," and "the fact that climate change is largely a global phenomenon that includes actions that are outside of [the agency's] control . . . does not release the agency from the duty of assessing the effects of *its* actions on global warming within the context of other actions that also affect global warming."[7]

As the U.S. Court of Appeals for the District of Columbia Circuit held in the 2017 *Sabal Trail* case, the "reasonably foreseeable" effects of authorizing a pipeline that will transport natural gas to power plants are that: (1) natural gas will be burned in those power plants, and (2) greenhouse gas emissions will be emitted as a result of burning the gas.[8] Indeed, these effects are not only "reasonably foreseeable," but transporting and burning natural gas is generally the entire purpose of pipeline construction or expansion.[9] In *Sabal Trail*, the D.C. Circuit concluded that because greenhouse gas emissions are an indirect, reasonably foreseeable effect of authorizing the project that FERC has legal authority to mitigate, the Environmental Impact Statement ("EIS") for the Southeast Market Pipelines Project should have given a quantitative estimate of the downstream greenhouse emissions that would result from burning the natural gas transported by the pipelines, or at least explained more specifically why the agency could not do so.[10]

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[7] *Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) (citations omitted). Notably, through the social cost of greenhouse gas methodology, agencies can calculate the incremental impact of an additional ton of emissions, given its interactions with global atmospheric concentrations over the next 300 years. *See* Policy Integrity's separate comments, submitted jointly with other organizations, on the social cost of greenhouse gases. *See* Institute for Policy Integrity et al., Comments to FERC on Using the Social Cost of Greenhouse Gases to Weigh the Climate Impacts of New Natural Gas Transportation Facilities in Environmental Analyses and in Reviews of Public Convenience and Necessity, *Certification of New Interstate Natural Gas Facilities*, Docket No. PL18–1–000 (submitted July 25, 2018) (hereinafter "Policy Integrity, Joint Comments on the Social Cost of Greenhouse Gases").

[8] *Sabal Trail*, 867 F.3d at 1371–74.

[9] *See id*.

[10] *Id*. at 1374.

The small number of cases reaching a seemingly different result from *Sabal Trail* used reasoning that would not apply here. In *Department of Transportation v. Public Citizen*, the Supreme Court found that the Department of Transportation was not required to analyze certain environment effects in its NEPA review because the agency had *no legal authority* to prevent those effects.[11] In three cases applying the rule from *Public Citizen* (the *Freeport* line of cases), the D.C. Circuit found that FERC, in licensing physical upgrades for an LNG terminal, was acting pursuant to narrow, delegated authority from the Department of Energy ("DOE") and had no legal authority to consider the environmental effects of LNG exports. As a result, FERC had no authority to rely on the climate effects of LNG exports as a justification for denying an upgrade license, and therefore no NEPA obligation to evaluate the climate change effects of exporting natural gas.[12]

FERC's decision to grant or deny a certificate of public convenience and necessity is clearly distinguishable from the reasoning in *Public Citizen.* The Commission's decisions under Section 7 of the Natural Gas Act are not constrained by a narrow delegation of authority. As detailed in Part I.B. below, the Commission has clear legal authority to consider environmental effects—including greenhouse gas emissions—in deciding whether a project is required by the public convenience and necessity, and consequently, it *must* consider them fully in its NEPA analysis.

In fact, the D.C. Circuit in *Sabal Trail*—which was decided after the *Freeport* line of cases and explicitly distinguished Section 7 certificates from LNG terminal approvals—made clear that because FERC has legal authority to consider climate change effects in its Natural Gas

[11] *See Dep't of Transp. v. Pub. Citizen*, 541 U.S. 752, 766-70 (2004).
[12] *See Sierra Club v. FERC*, 827 F.3d 36 (D.C. Cir. 2016) ("*Freeport*"); *Sierra Club v. FERC*, 827 F.3d 59 (D.C. Cir. 2016) ("*Sabine Pass*"); *EarthReports, Inc. v. FERC*, 828 F.3d 949 (D.C. Cir. 2016).

Act pipeline certificate determinations, FERC must properly analyze those effects pursuant to NEPA.[13] The D.C. Circuit found that because "FERC could deny a pipeline certificate on the ground that the pipeline would be too harmful to the environment, the agency is a 'legally relevant cause' of the direct and indirect environmental effects of pipelines it approves."[14]

Though in *Sabal Trail* the D.C. Circuit knew which power plants would burn the gas from the pipeline, knowing the exact, individual end-uses is not a necessary precondition to assessing reasonably foreseeable downstream emissions.[15] While a very small percentage of U.S. natural gas supply ends up in non-combustion applications,[16] nearly all pipeline gas will eventually be combusted. As explained further below, when pipeline gas is combusted it produces carbon dioxide at a relatively consistent rate. Consequently, the specific form of combustion and location of end use need not be known with certainty in order to develop reasonable estimates of downstream greenhouse emissions. As FERC has recognized, two projects with different "end users in different states" but with the same quantity of gas transported "will contribute identically to global climate change."[17]

The foreseeable and readily quantifiable downstream emissions from combustion of the pipeline gas contrast with other indirect effects where quantification may not always be feasible.

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[13] *See Sabal Trail*, 867 F.3d at 1371–74 (citing *Minisink Residents for Envtl. Pres. & Safety v. FERC*, 762 F.3d 97, 101-02 (D.C. Cir. 2014)*; Myersville Citizens for a Rural Cmty. v. FERC*, 783 F.3d 1301, 1309 (D.C. Cir. 2015)).
[14] *Id*. at 1373.
[15] *Contra Dominion Transmission Inc.*, 163 ¶ 61,128 at P 39 (2018) ("*New Market*") ("[N]othing in the record . . . identifies any specific end use . . . [and] knowledge of these and other facts would indeed be necessary . . . to fully analyze the effects related to the production and consumption of natural gas.").
[16] *See, e.g.*, EIA, *Non-Combustion Use of Fossil Fuels 1980-2011* (2012), https://www.eia.gov/totalenergy/data/annual/showtext.php?t=ptb0115 (showing that only a small percentage of total natural gas is not combusted); EIA, *Monthly Energy Review* tbl 1.11a (released June 26, 2018), https://www.eia.gov/totalenergy/data/monthly/pdf/sec1_22.pdf (also showing that only a small percentage of total natural gas is not combusted).
[17] *Florida Southeast Connection, LLC*, 162 FERC ¶ 61,233 at PP 28, 51 (2018) (*Sabal Trail Remand*).

In *Sabal Trail*, the D.C. Circuit explained that "We do not hold that quantification of greenhouse-gas emissions is required *every* time those emissions are an indirect effect of an agency action. We understand that in some cases, quantification may not be feasible."[18] But quantification and monetization of the downstream climate consequences of combustion is a simple exercise of multiplying a reasonable estimate of the total gas transported by the accepted average emission factor of greenhouse emissions per volume of pipeline gas combusted.[19]

FERC should amend its policy statement to clarify that analysis of upstream and downstream greenhouse gas emissions associated with potential pipeline projects—in addition to analysis of foreseeable direct greenhouse gas emissions from construction, operation, and leaks—is required in order to comply with NEPA. *Sabal Trail* leaves little doubt as to the necessity of upstream and downstream emissions analysis, and numerous federal courts have reached the same conclusion with respect to other federal agencies' NEPA analysis.

A. FERC should incorporate environmental effects into its public convenience and necessity test pursuant to the Natural Gas Act.

The evaluation of an interstate natural gas pipeline project's reasonably foreseeable direct and indirect environmental consequences is not merely an academic or information-gathering exercise. Rather, as explained above, the environmental information gathered as part of the NEPA process is required and useful because the Commission has the power to approve or deny

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[18] *Sabal Trail*, 867 F.3d at 1374 (citing *Sierra Club v. U.S. Dep't of Energy*, 867 F.3d at 189)

[19] *See* U.S. Envtl. Protect. Agency, Annex 2 Methodology and Data for Estimating CO2 Emissions from Fossil Fuel Combustion at A74 to A76, https://www.epa.gov/sites/production/files/2018-01/documents/2018_annex_2.pdf (describing EPA's methodology for determining the carbon content of pipeline gas that will be released to the atmosphere when combusted);). *see also* U.S. Envtl. Protect. Agency Center for Corporate Climate Leadership, Emission Factors for Greenhouse Gas Inventories (March 9, 2018), https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf (providing emission factors for CO_2, CH_4, and N_2O that results from natural gas combustion).

projects on the basis of the environmental consequences. But to date under the existing Policy Statement, the environmental information developed as part of the NEPA process has played only a limited role in the Commission's evaluation of proposed pipeline projects.[20] As the Commission reevaluates its Policy Statement, it has an opportunity to more fully incorporate environmental considerations—and, in particular, the climate damages or benefits that result from new and expanded natural gas pipelines—into its process for evaluating, approving, or denying certificates of public convenience and necessity under Section 7 of the Natural Gas Act. The Commission should adopt a policy to incorporate environmental consequences—including direct, upstream and downstream emissions—into its public convenience and necessity determination under the Natural Gas Act. Pursuant to Section 7 of the Natural Gas Act, the construction and operation of all interstate natural gas facilities requires a "certificate of public convenience and necessity issued by the Commission authorizing such acts or operations."[21] The Commission is directed to approve only those certificates that are "or will be required by the present or future public convenience and necessity."[22] And the Commission has the power to establish "such reasonable terms and conditions as the public convenience and necessity may require."[23] In all of these cases, the Commission is required to exercise its expert judgment to advance only those projects and under such conditions as meet the public convenience and necessity test.

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[20] *See Policy Statement NOI*, 163 FERC ¶ 61,042 at P 18 (describing the Commission's consideration of environmental consequences as "simultaneous" but distinct from the "balancing of benefits and adverse effects").
[21] 15 U.S.C. § 717f(c)(1)(A).
[22] 15 U.S.C. § 717f(e).
[23] *Id.*

The public convenience and necessity standard encompasses "all factors bearing on the public interest."[24] As the Commission and courts have long recognized, the weighing of the upstream and downstream consequences of a natural gas pipeline project—including the environmental consequences—is a key component of evaluating the "public interest."

In 1961, the Supreme Court tacitly acknowledged that the downstream environmental and air pollution effects of natural gas pipeline construction were an important part of the Commission's public interest determination. In *FPC v. Transcontinental Gas Pipe Line Corp.* (*Transco)*, the Court considered a challenge to the Commission's decision to deny a certificate of public convenience and necessity based on an evaluation of "policy" factors such as the pipeline's effect on downstream conservation and end use price of natural gas.[25] The Court held that Congress intended the Section 7 language to give the Commission broad (though not unlimited) discretion in evaluating the public interest and that the Commission acted within that authority even when considering how a pipeline would affect activity that was not within FERC's jurisdiction.[26] Notably, the Court implicitly adopted reasoning that downstream air pollution was a public interest factor that the Commission could consider when it accepted the Commission's expert judgment that the pipeline at issue would *not* sufficiently advance clear air objectives to overcome the Commission's concerns.[27]

Contrary to the Commission's recent suggestion,[28] the Supreme Court's decision in *NAACP v. FPC* reinforces the idea that environmental considerations are a critical part of the

[24] *Atl. Refining Co.* v. *Pub. Serv. Comm'n of N.Y.*, 360 U.S. 378, 391 (1959).
[25] 365 U.S. 1, 23, (1961).
[26] *Id.* at 28.
[27] *Id.* at 30; *Id.* at 42 (*Harlan, J.,* concurring in part and dissenting in part) (explaining that on remand the Commission should take a closer look at whether downstream air pollution improvements are sufficient to overcome other concerns in order to justify approval of the certificate).
[28] *See New Market*, 163 FERC ¶ 62,128 at P 43.

Commission's evaluation of pipelines under Section 7 of the Natural Gas Act.[29] In that case, the Supreme Court held that the Commission's "public interest" authority allowed it to issue a rule requiring equal employment opportunity of regulated utilities only if it determined that discrimination undermined just and reasonable rates in the public interest. The Court determined that the Commission's obligation to act in the public interest is not a "license to promote the general public welfare," but rather the Commission must promote the public interest within the context of the purposes of the acts it administers.[30] As the Supreme Court explained, FERC's primary role is to "encourage the *orderly* development of plentiful supplies . . . of natural gas at reasonable prices."[31] The use of "orderly" suggests rational decisionmaking, which necessarily entails considering factors that are the consequence of FERC's actions. Perhaps for that reason, in a widely cited footnote, the Court explicitly determined that "the Commission has authority to consider . . . environmental . . . questions" because they are a "subsidiary purpose[]" of the Natural Gas Act.[32] More recently, the D.C. Circuit affirmed that FERC's "section 7 duty to consider the public interest is broader than promoting a plentiful supply of cheap gas, as important as that policy may be."[33] Consideration of the climate consequences of a certificate approval, including the upstream and downstream consequences facilitated by new pipeline infrastructure, is clearly within the purposes of the Natural Gas Act.

Numerous courts have interpreted this discussion and subsequent caselaw to confirm that the Commission has authority to consider environmental questions when evaluating a Section 7

[29] 425 U.S. 662 (1976).
[30] *Id.* at 669.
[31] *Id.* at 669-70 (emphasis added).
[32] *Id.* at 670 & n. 6.
[33] *Fla. Gas Transmission Co. v. FERC*, 604 F.3d 636, 650 (D.C. Cir. 2010).

certificate application.[34] And if there were any lingering question, the court's decision in *Sabal Trail* makes clear that consideration of downstream environmental consequences of jurisdictional pipelines facilities is part of the Commission's obligation to consider the public interest under Section 7.[35]

The Commission has raised the question of whether the public interest inquiry under Section 7 can extend even beyond the environmental considerations dictated by NEPA.[36] Upstream and downstream greenhouse gas emissions are reasonably foreseeable indirect consequences of pipeline projects and so they must be analyzed under NEPA.[37] To that end, they are also required to be part of the Commission's weighing of whether a project is in the public convenience and necessity.

Moreover, the Natural Gas Act does not limit the Commission's consideration of a project's consequences to those required by NEPA. The Supreme Court's decision in *Transco* that the Commission has the authority to consider downstream consequences of a certificate approval predated enactment of NEPA. The Court held that the Commission could consider the downstream benefit of cleaner air due to energy substitution and the downstream costs of

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[34] *Pub. Utilities Comm'n of State of Cal. v. FERC*, 900 F.2d 269, 281 (D.C. Cir. 1990); *Minisink*, 762 F.3d at 101; *Myersville*, 783 F.3d at 1307; *Sierra Club v. DOE*, 867 F.3d 189, 202 (D.C. Cir. 2017).
[35] *Sabal Trail*, 867 F.3d at 1373 ("Congress broadly instructed the agency to consider the public convenience and necessity when evaluating applications to construct and operate interstate pipelines. FERC will balance the public benefits against the adverse effects of the project, *including adverse environmental effects*") (emphasis added and citations and quotations omitted).
[36] *New Market*, 163 FERC ¶ 62,128 at P43.
[37] The Commission has suggested that without specific information on the source of natural gas or the particular end users, it concludes that a proposed project will have no effect. *New Market*, 163 FERC ¶ 62,128 at P 43 (refusing to quantify upstream and downstream emissions under the Natural Gas Act because "environmental effects that are not effects of the proposed project are extraneous to our consideration"). However, as explained in Part IV, basic economics makes clear that expanding pipeline capacity will result in *some* increase of emissions and there are numerous tools available to reasonably estimate this increase. The lack of information about specific sources and end uses does not mitigate the fact that a pipeline will effect emissions and so must be incorporated, to the extent feasible, into NEPA and Natural Gas Act analyses.

inefficient use of natural gas and increasing retail prices. This was the case even though the Commission did not have the authority to control those downstream uses or prices directly.[38] In fact, FERC regularly incorporates upstream and downstream consequences in its pipeline certificate approval analysis. FERC considers access to new supply sources to be a benefit of the project.[39] But new supply is a benefit only because of *upstream* extraction of new gas. And FERC already considers increased electric system reliability to be a benefit of additional pipeline capacity.[40] But increased reliability is achieved only by facilitating additional *downstream* combustion of natural gas. Regularly considering the upstream and downstream benefits of a pipeline when evaluating the public interest, while categorically ignoring the upstream and downstream costs imposed by additional greenhouse gas emissions, is arbitrary.[41]

When evaluating whether a particular project is a public necessity under the Natural Gas Act, the Commission must evaluate how that pipeline will affect the public, including to what extent it will facilitate upstream and downstream greenhouse gas emissions, in what quantities, and to what extent those emissions will cause monetizable damages.[42]

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[38] *Transcon. Gas Pipe Line Corp*., 365 U.S. at 22, 25.

[39] *Texas Eastern Transmission, LP*, 164 FERC ¶ 61,037 at P 13 (2018) (identifying connection of "diverse supply basins with emerging Gulf Coast markets" as a "benefit[] that will result from the project"). *See also* Policy Statement, 88 FERC ¶ 61,227 at 25 (identifying potential benefits when evaluating need, including "access to new supplies").

[40] *Columbia Gas Transmission LLC,* 164 FERC ¶ 61,036 at P 62 (2018) (acknowledging that the project's purpose is to increase natural gas supply options and increase electric system reliability). *See also* Policy Statement, 88 FERC ¶ 61,227 at 25 (identifying potential benefits when evaluating need, including "increasing electric reliability, or advancing clean air objectives).

[41] *Michigan v. EPA*, 135 S. Ct. 2699, 2707 (2015) ("[R]easonable regulation ordinarily requires paying attention to the advantages and the disadvantages of agency decisions.").

[42] *C.f. Zero Zone*, 832 F.3d 654 (7th Cir. 2016). In that case the United States Court of Appeals for the Seventh Circuit held that DOE has authority to consider of environmental benefits when setting appliance efficiency standards, including specifically the benefit of greenhouse gas reduction as monetized by the social cost of greenhouse gases. The court's reasoned that the requirement to "consider 'the *need* for national energy . . . conservation" included evaluation of costs and benefits, including the avoided climate damages. *Id.* at 677 (emphasis added). The court also stated that the requirement to consider the

B. The Commission's alternatives analysis under NEPA can and should better inform its decisions under the Natural Gas Act.

The Commission's obligation under NEPA is not merely to evaluate the reasonably foreseeable direct and indirect environmental consequences of the single proposed project, but also to analyze the environmental consequences of potential alternatives that meet the purpose and need of the project, as well as the "no action" alternative.[43] Moreover, the alternatives analysis required by NEPA can and should facilitate the Commission's obligations to evaluate projects under Section 7 of the Natural Gas Act.

Under Section 7, the Commission must determine if a proposed project is in the public interest.[44] If it is not, the Commission is required to deny the project a certificate of public convenience and necessity. This initial decision aligns with the Commission's obligation to analyze the proposed project as the preferred alternative, and to include a "no action alternative" in which the Commission denies as Section 7 certificate.[45]

However, the Natural Gas Act also allows the Commission to establish "reasonable terms and conditions as the public convenience and necessity may require."[46] This authority can be exercised to require the applicant to make certain construction, operational, or other changes that would mitigate the extent of environmental damage. For direct environmental consequences, the Commission could, for instance, require applicants to deploy more aggressive leak mitigation.

"economic impact of the standard" probably included consideration of climate damages because they "have an economic impact." *Id.* at n. 24.

[43] 40 C.F.R. § 1502.14(a) (calling the alternatives analysis "the heart of the environmental impact statement" because it "sharply defin[es] the issues and provid[es] a clear basis for choice among options by the decisionmaker and the public"). Note that contrary to the NOI's assertion that "an agency need only evaluate alternatives that can satisfy the purpose and need of the proposed project," 163 FERC ¶ 61,042 at P 10, NEPA requires agencies to consider a broader range of alternatives including, minimally, taking no action.

[44] 15 U.S.C. § 717f(e).

[45] 40 C.F.R. § 1502.14.

[46] 15 U.S.C. § 717f(e).

Currently, the Commission generally requires new pipeline projects to comply with air permits regarding methane leaks.[47] However, additional mitigation, including more aggressive leak detection and repair regimes, may be feasible and particularly valuable to the extent that EPA regulations limiting methane emissions from new oil and gas sources are repealed or weakened.

For reasonably foreseeable indirect emissions, there are limited conditions that the Commission could attach. For example, the Commission could consider attaching conditions that limit the quantity of gas transported through a pipeline or that limit the time period over which the pipeline operates. Conditions that limit the volume of gas transported could include requiring the applicant build a project with smaller peak capacity or limiting contracts that would result in high load factor for the pipeline in favor of contracts intended to supply a smaller volume of natural gas over the course of a year during peak demand. Conditions that limit the time period over which the project operated could include a time-limited certificate of public convenience and necessity that is only operative for a set number of years. The Commission can use its widely supported pre-filing program to work with pipeline applicants on these conditions so that they can be efficiently integrated into project development at early stages.[48]

The climate implications of a proposed project, including the change in upstream and downstream greenhouse gas emissions, can and should be evaluated for each of the various reasonable alternatives (including the proposed project, project with reduced capacity, project with conditions such as operational limits, and no action alternative). The Commission can then

[47] *See* Atlantic Bridge Project Environmental Assessment at 2-96, *Algonquin Gas Transmission, LLC*, Docket No. CP16-9-000 (2016) (requiring compliance with EPA's oil and gas new source performance standards, including leak detection and repair, at 40 C.F.R. Part 60 Subpart OOOOa), https://www.ferc.gov/industries/gas/enviro/eis/2016/CP16-9-000-EA.pdf.
[48] *See Policy Statement NOI*, 163 FERC ¶ 61,042 at P 37 (describing the pre-filing program).

balance each alternatives' public benefits against its potential adverse consequences and select the approach that is most in the public interest.

II. The Commission Should Adopt a Policy That It Will Quantify and Monetize Upstream and Downstream Greenhouse Gas Emissions in All NEPA and Natural Gas Act Analyses, to the Maximum Extent Feasible.

The Commission should adopt a policy that it will quantify and monetize upstream and downstream greenhouse gas emissions in all NEPA and Natural Gas Act analyses, to the maximum extent feasible. Adopting such a policy would be consistent with legal precedent and other federal agency practice.

NEPA requires that federal agencies prepare EISs for "major Federal actions significantly affecting the quality of the human environment."[49] If any significant environmental impacts might result from the proposed agency action, "an EIS must be prepared before the [agency] action is taken."[50] An agency can avoid preparing an EIS if it issues a proper Environmental Assessment ("EA"), followed by a Finding of No Significant Impact ("FONSI"). In reviewing an EA and FONSI, courts determine whether the agency: (1) has accurately identified the relevant environmental concern, (2) has taken a "hard look" at the problem in preparing its analysis, (3) is able to make a convincing case for its finding of no significant impact, and (4) has shown that even if there is an impact of true significance, an EIS is unnecessary because changes or safeguards in the project sufficiently reduce the impact to a minimum.[51]

NEPA's requirement to take a "hard look" at the environmental impacts of federal actions, and to analyze both direct and indirect (including upstream and downstream) emissions,

[49] 42 U.S.C. § 4332(C).
[50] *Sierra Club v. Peterson*, 717 F.2d 1409, 1415 (D.C. Cir. 1983) (emphasis omitted).
[51] *Sierra Club v. Van Antwerp*, 661 F.3d 1147, 1153–54 (D.C. Cir. 2011).

applies to both EISs and EAs.[52] Federal courts increasingly hold that agencies must quantify, and often monetize, greenhouse gas emissions associated with their major federal actions in both EAs and EISs.[53]

For example, in 2017, a federal district court held that the Department of the Interior's Office of Surface Mining and Enforcement's EA for a mining plan modification and expansion violated NEPA by failing to take a hard look at the indirect and cumulative effects of coal combustion.[54] The court found that the EA did not adequately address non-local impacts of non-greenhouse gas emissions from coal combustion, which the court found to be reasonably foreseeable rather than highly speculative or indefinite, as the agency had claimed. The court stated "[t]hat the coal extracted from the mine will be combusted is not so 'highly speculative' that *any* analysis of non-greenhouse gas emissions would be impractical, even if the precise locations of combustion are uncertain."[55] The court further held that the EA was deficient because it failed to quantify and monetize the indirect and cumulative greenhouse gas emissions

[52] *See* 40 C.F.R. § 1508.9; *Ctr. for Envtl. Law & Policy v. U.S. Bureau of Reclamation*, 655 F.3d 1000, 1006 (9th Cir. 2011) ("As part of the [EA] analysis, the agency must consider 'the direct, indirect, and cumulative impacts of the action.'"); *Montana Envtl. Info. Ctr. v. U.S. Office of Surface Mining*, 274 F. Supp. 3d 1074, 1091 (D. Mont. 2017).
[53] *See Sabal Trail*, 867 F.3d 1371–74 (holding that FERC must quantify downstream greenhouse gas emissions in an EIS for a pipeline construction and operation or explain why it cannot do so); *Montana Envtl. Info,* 274 F. Supp. 3d at 1094-97 (holding that an agency must quantify and monetize downstream emissions in an EA for a coal mine expansion); *High Country Conservation Advocates v. United States Forest Service*, 52 F. Supp. 3d 1174, 1190 (D. Col. 2014) (holding that, "[e]ven though NEPA does not require a cost-benefit analysis, it was nonetheless arbitrary and capricious to quantify the *benefits* of the [coal] lease modifications and then explain that a similar analysis of the *costs* was impossible when such an analysis was in fact possible and was included in an earlier draft EIS.") (emphasis original); *see also Center for Biological Diversity v. National Highway Traffic Safety Administration*, 538 F.3d 1172, 1198 (9th Cir. 2008) (holding that it was arbitrary and capricious for an agency to fail to monetize the benefits of greenhouse gas emissions reduction when setting corporate average fuel economy standards because "it cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent standards.").
[54] *Montana Envtl. Info. Ctr.*, 274 F. Supp. 3d at 1093-94.
[55] *Id*. at 1094 (emphasis original).

associated with coal train transportation and downstream coal consumption.[56] The court noted that the agency had quantified the socioeconomic benefits of the coal mine expansion while failing to quantify the environmental costs even though a tool—the Interagency Working Group's Social Cost of Carbon—was available to do so.[57]

Other federal agencies regularly disclose and quantify direct and indirect greenhouse gas emissions, including from upstream extraction and downstream combustion, in their EAs and EISs for fossil fuel-related projects. The Surface Transportation Board has, for instance, disclosed direct, upstream, and downstream greenhouse gas emissions in its EISs for rail lines that regularly transport coal.[58] In a 2015 EIS, the Surface Transportation Board's lifecycle greenhouse gas emissions analysis considered the direct emissions from construction and operation of a proposed rail line; the indirect upstream emissions from methane leaks from induced production at coal mines; and the indirect downstream emissions from the ultimate combustion of the coal (net of substitution effects).[59] Similarly, the State Department's final supplemental EIS for the Keystone XL pipeline, released in 2014, includes direct construction and operating emissions, including fugitive emissions, as well as indirect emissions from production, refining, and combustion of the oil transported by the pipeline.[60]

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[56] *Id*. at 1085-99 (citing *High Country Conservation Advocates*, 538 F.3d at 1198).
[57] *Id*. at 1094.
[58] *E.g.,* Surface Transp. Bd., *Draft Environmental Impact Statement for the Proposed Construction and Operation of the Tongue River Railroad* at F-2 (2015), https://www.stb.gov/decisions/readingroom.nsf/UNID/E7DE39D1F6FD4A9A85257E2A0049104D/$file/AppF_Lifecycle+GHG.pdf (quantifying not only downstream combustion emissions of a coal-rail project, but also upstream emissions including the production of the steel and other materials to construct the new rail track).
[59] *See id.*
[60] U.S. State Dept., *Final Supplemental Environmental Impact Statement for the Keystone XL Pipeline* at 4.14-4 (2014), https://2012-keystonepipeline-xl.state.gov/documents/organization/221190.pdf.

In 2017, BLM and the Office of Surface Mining Reclamation and Enforcement ("OSMRE") issued a joint EA for a federal coal lease modification and mine permit revision that quantified direct carbon dioxide emissions from equipment to operate the mine and construct the improvements; indirect carbon dioxide emissions from the mine workers' commutes; methane emissions from the coal extraction process; indirect carbon dioxide emissions from transporting the coal;[61] and downstream carbon dioxide emissions from coal combustion.[62] Notably, even though the agencies did not know the exact end uses for all of the coal anticipated to be produced, they "assume[d] that the remaining portion of the maximum year coal to be shipped . . . is eventually combusted,"[63] and made reasonable assumptions about the average emission factor (based on EPA data) to estimate carbon dioxide from combusting that coal.[64] As a fourth example, the Bureau of Ocean Energy Management ("BOEM") prepared a detailed assessment of the upstream and downstream greenhouse gas emissions associated with offshore oil and natural gas leasing pursuant to its five-year program for 2017 to 2022.[65] BOEM quantified and monetized—using the Interagency Working Group's Social Cost of Carbon—the cost of the

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[61] While the agencies only quantified emissions from coal transport "where a destination and quantity of delivered coal is known," that in no way suggests that end uses must be known before estimating the downstream emissions of combustion. Needing to know the destination of coal transportation to estimate emissions based on vehicle-miles travelled is more analogous to needing to know the length of a gas pipeline to estimate possible methane leaks. In fact, in the King II Mine EA, the agencies did estimate downstream emissions even though not all end uses were known. That said, reasonable assumptions about average vehicle-miles travelled per ton could have been applied to estimate all the coal transport-related emissions in the King II Mine EA.

[62] *See* Environmental Assessment, DOI-BLM-CO-S010-2011-0074-EA, Federal Coal Lease (COC-62920) Modification and Federal Mine Permit (CO-0106A) Revision and Renewal 76-82 (Oct. 12, 2017), *available at* https://bit.ly/2ufWNSL [hereinafter "King II Mine EA"].

[63] *Id.* at 81.

[64] *Id*. at 82. The agencies explained that, compared to the very facility-specific emissions of hazardous and criteria pollutants, "there are far fewer parameters" for estimating greenhouse gas emissions from coal combustion. *Id.* at 81. Greenhouse emissions from pipeline gas combustion are even more uniform than for coal combustion.

[65] U.S. Bureau of Ocean Energy Mgmt., *OCS Oil and Natural Gas: Potential Lifecycle Greenhouse Gas Emissions and Social Cost of Carbon* 15 (2016), https://perma.Cc/2mxn-Qxbv.

greenhouse gas emissions from the production, processing, storage, transportation, and ultimate consumption of oil and gas that could be produced in three different price scenarios.[66]

Monetizing the climate damages associated with the tons of carbon dioxide, methane, and nitrous oxide emitted provide important and necessary context to these effects, in line with NEPA's information disclosure purpose. Among other important benefits, monetizing emissions aids in the determination of whether environmental effects are "significant," and can assist FERC in assessing whether a pipeline is in the public interest pursuant to the Natural Gas Act.[67] For example, in another recent EIS from BOEM published in August 2017, the agency explained that monetized climate damages provided "a useful measure" to facilitate comparing approval of an offshore oil lease against the no action alternative.[68]

As explained in detail in Policy Integrity's joint comments submitted with other groups in this docket, the federal Interagency Working Group developed a social cost of greenhouse gas methodology that can serve as a clear and widely accepted tool to monetize the climate damages of upstream, downstream, and direct greenhouse gas emissions.[69]

Monetization of climate damages would also allow the Commission to incorporate climate damages more clearly into its Section 7 analysis. By using the common metric of dollars, monetization of climate damages allows the Commission to incorporate those consequences into

[66] *Id*. at v, 29-31. BOEM declined to conduct energy substitution analysis, and instead "assumed that, for purposes of this analysis and the analysis that forms the basis of the 2017-2022 Program, foreign sources of oil will substitute for reduced OCS supply, and the production and transport of that foreign oil would emit more GHGs." *Id*. at foreword. This omission means that BOEM did not fully analyze greenhouse gas implications associated with its leasing decisions. *See* Part IV for more information on how FERC should conduct substitution analysis.

[67] *See* 40 C.F.R. § 1508.27 (delineating NEPA's significance criteria); 15 U.S.C. § 717f(e) (Natural Gas Act certificate determination).

[68] U.S. Bureau of Ocean Energy Mgmt, *Liberty Development and Production Plan Draft EIS* at 3-129, 4,50 (2017) (89,940,000 minus 64,570,000 is about 25 million).

[69] Policy Integrity, Joint Comments on the Social Cost of Greenhouse Gases, *supra* note 7.

its "economic test," to compare the varying climate consequences over time of different project alternatives, and to weigh those consequences, along with all other adverse consequences, against the public benefits of the project.

The Commission has historically evaluated environmental consequences on a separate track from the "economic test" that it uses to weighs the public benefits of a project against potential adverse consequences.[70] And the current Policy Statement includes language that appears to limit the "affected interests" that are considered in the economic test to "the interests of customers, competitors, landowners and local communities."[71] But by facilitating increased greenhouse gas emissions that exacerbate climate change, pipelines result in adverse consequences even beyond the local community through which a pipeline runs, including damage to the global environment.[72] The Commission risks undervaluing the climate consequences of a project when it fails to put those consequences on equal footing with the adverse consequences to customers, competitors, landowners and local communities, even though they are a reasonably foreseeable consequence of the project. The climate consequences that result from an increase in greenhouse gas emissions due to a pipeline project are just as "real" as the adverse consequences to that the Commission considers in its balancing test. And greenhouse gas emissions caused by increased combustion of natural gas have properties that

[70] *Policy Statement NOI*, 163 FERC ¶ 61,042 at P 18.
[71] *Policy Statement*, 88 FERC ¶ 61,227 at 18 ("If the proposed project will not have any adverse effect on the existing customers of the expanding pipeline, existing pipelines in the market and their captive customers, or the economic interests of landowners and communities affected by the route of the new pipeline, then no balancing of benefits against adverse effects would be necessary"); *id.* at 23 ("there are three major interests that may be adversely affected by approval of major certificate projects, and that must be considered by the Commission. These are: the interests of the applicant's existing customers, the interests of competing existing pipelines and their captive customers, and the interests of landowners and surrounding communities.").
[72] Of course, in the long run, customers, landowners, and local communities will also experience negative economic social, and environmental effects from climate change.

make their incorporation into the economic test that the Commission currently uses relatively straightforward. This includes, as described in Part IV.B, a relatively consistent emission rate when combusted, the fact that the consequences of emissions are unconnected to the location of emissions, and the availability of a widely accepted, straightforward tool to monetize the damages of climate change—the Interagency Working Group's social cost of greenhouse gases methodology. Therefore, climate consequences should be just as relevant to the Commission's decision regarding whether a project is in the public interest and should be directly incorporated into the economic test under which the Commission weighs the benefits and adverse consequences of a project.

The Commission should adopt the use of the Interagency Working Group's social cost of greenhouse gases in order to ensure that it is transparently and systematically evaluating whether proposed pipeline projects and their alternatives are in the public interest as required by Section 7 of the Natural Gas Act.

The analysis described in these comments, including the monetization of the climate consequences of a proposed project and alternatives will allow the Commission to better assess the tradeoffs among competing pipeline proposals or project alternatives. By monetizing environmental effects and incorporating those monetized values into the economic test used to weigh whether a project is in the public interest, the Commission can distinguish between projects that have substantial climate consequences and limited public benefits and those that have substantial public benefits with limited or positive limited climate consequences. Even those projects that have significant consequences may be in the public interest if the public benefit of additional natural gas capacity is substantial. But the Commission cannot rationally and responsibly make such a decision without actually weighing the full suite of readily discernable consequences against the discernable benefits of a project.

In order to ensure that the Commission approves project alternatives that enhance rather than detract from social welfare, it should quantify the full scope of greenhouse gases that are the direct and indirect consequence of the project, monetize the economic value of those increased or decreased greenhouse gas emissions, and incorporate those costs and benefits into its evaluation of whether a project is in the public interest.

III. FERC Should Request That Certificate Applicants Provide as Much Information as Possible on the Expected Source, End Use, and Amount of Natural Gas to be Transported Through a Proposed Pipeline.

FERC has sometimes claimed that it lacks specific information on foreseeable upstream and downstream emissions.[73] However, NEPA's "hard look" requirement encompasses a thorough investigation into the environmental effects of an agency's action. FERC must ask for relevant information about foreseeable environmental effects from pipeline certificate applicants before claiming that such information is not available. Information on expected pipeline capacity and throughput, the source of the natural gas, and its expected end use is highly relevant to FERC's NEPA analysis as well as to its determination as to whether approving a pipeline is in the public interest pursuant to the Natural Gas Act.

NEPA was enacted to ensure that "environmental information is available to public officials and citizens *before decisions are made* and *before actions are taken*."[74] Courts review agencies' NEPA compliance by "mak[ing] a pragmatic judgment whether the EIS's [or EA's]

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[73] *See, e.g., New Market*, 163 FERC ¶ 61, 128 at PPP 62-66; *Tennessee Gas Pipeline Company, L.L.C.*, 163 FERC ¶ 61,190 at PP 60-61 (2018) (*Broad Run*) (rejecting the need for additional analysis of upstream and downstream analysis as part of an EA because Commission stated that upstream and downstream emissions were not reasonably foreseeable given the information before it).
[74] *See* 40 C.F.R. § 1500.1(emphasis added); *see id.* § 1500.2.

form, content and *preparation* foster both informed decision-making and informed public participation."[75] The inquiries that an agency makes, or fails to make, are relevant to compliance with NEPA. [76]

In fact, FERC cannot point to uncertainty or lack of knowledge about upstream and downstream emissions in an EA as grounds for issuing a Finding of No Significant Impact ("FONSI"); rather, it must show why any such emissions are *not* significant, and if it cannot do so, it must prepare an EIS. Lack of relevant information, such as lack of information on expected upstream or downstream emissions, weighs towards preparing an EIS in order to gather that missing information, rather than issuing a FONSI after an EA.[77] FERC must gather relevant data on upstream and downstream emissions in order to take a "hard look" at the environmental consequences of it action. Claiming that such emissions are "too speculative" breaks with legal precedent and cannot support a FONSI.[78] It is preferable to quantify and monetize upstream and

[75] *Marsh v. Oregon Nat. Res. Council*, 490 U.S. 360, 368 (1989) (emphasis added).
[76] *See Nat'l Audubon Soc'y v. Dep't of Navy*, 422 F.3d 174, 185 (4th Cir. 2005) (stating that the "hard look" requirement "encompasses a *thorough investigation* into the environmental impacts of an agency's action...") (emphasis added); *see also American Wild Horse Preservation Campaign v. Perdue*, 873 F.3d 914, 931 (D.C. Cir. 2017) (finding that an agency's EA did not "accurately identif[y] the relevant environmental concern"—the effect of a boundary modification on the wild horse population—and instead took a "head-in-the-sand approach to past agency practice" which the court stated "is the antithesis of NEPA's requirement that an agency's environmental analysis candidly confront the relevant environmental concerns.").
[77] *See* 40 C.F.R. § 1502.22; *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1240 (9th Cir. 2005) ("Preparation of an EIS is mandated where uncertainty may be resolved by further collection of data, or where the collection of such data may prevent speculation on potential ... effects."); *Montana Envtl. Info. Ctr.*, 274 F. Supp. 3d at 1085-87, 1091 (vacating the Office of Surface Mining and Enforcement's mining plan EA on several grounds and stating, "an agency should not attempt to travel the easy path and hastily label the impact of the [action] as too speculative and not worthy of agency review.") (internal citations omitted).
[78] *See id*.

downstream emissions rather than fail to disclose this information, which can subject the agency to legal risk under NEPA.[79]

The collection of relevant information, including information on environmental consequences of a project, is also required under the Natural Gas Act. The Commission's obligation under Section 7 is to grant a certificate only "if it is *found* . . . that the proposed service, sale, operation, construction, extension, or acquisition . . . . is or will be required by the present or future public convenience and necessity."[80] It would be impossible for the Commission to make an affirmative finding regarding a project without sufficient information relevant to critical factors that drive whether a project is in the public interest, including environmental effects. For this reason, the Natural Gas Act gives the Commission explicit authority to establish information collection requirements as part of the Section 7 application process.[81] The Commission has previously recognized that the collection of additional information from applicants may be necessary when the Commission revises the criteria by which it determines that projects are in the public interest under Section 7.[82] And courts have upheld the Commission's rejection of certificate applications on the basis that insufficient information was provided by the applicant to judge whether the project was required by the public convenience and necessity, including based on the lack of information that the applicant

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[79] *See id.; see also Ocean Advocates v. U.S. Army Corps. of Engineers*, 402 F.3d 846, 871 (9th Cir. 2005) (holding that the Army Corps failed to consider the potential for increased tanker traffic and oil spill and "acted arbitrarily and capriciously in failing to gather this quantifiable data").
[80] 15 U.S.C. § 717f(e) (emphasis added).
[81] 15 U.S.C. § 717(f) ("Application for certificates shall . . . . contain such information . . . as the Commission shall, by regulation, require").
[82] *See Revisions to Forms, Statements, and Reporting Requirements for Natural Gas Pipelines*, Order No. 710, FERC Stats. & Regs. ¶ 31,267, at P 23 (2008) (describing information requirements regarding a company's individual rate treatments for services in order for the Commission to fully evaluate whether a project meet the criteria in its Policy Statement).

would have been required to obtain from a downstream counterparty.[83] To the extent that direct, upstream, and downstream emissions are relevant factors for evaluating whether a project is in the public interest—and, as discussed above in Parts I and II, they are—the Commission must try to obtain relevant information in order to make an affirmative finding that a project is required by the public convenience and necessity.

FERC should clarify in its Policy Statement that it will ask certificate applicants and other stakeholders for relevant information on expected pipeline capacity, natural gas throughput, and the likely source or end use of the gas to be transported through a pipeline. This information is relevant to both its NEPA and Natural Gas Act analysis, and FERC should attempt to gather information relevant to upstream and downstream emissions itself if applicants do not provide it.[84]

IV. Barring More Precise Information from Project Applicants, the Commission Should Use Reasonable Default Estimates and Available Tools to Calculate Upstream and Downstream Greenhouse Gas Emissions.

Despite requesting relevant information, project applicants may not always have or provide sufficient reliable information to fine-tune the estimates of upstream and downstream greenhouse gas emissions that will result from a project. This need not limit the Commission's consideration of environmental consequences caused by an increase in upstream and downstream greenhouse gas emissions facilitated by a proposed project. Reasonably accurate, useful estimates of upstream and downstream emissions can be made even without project-specific information on precise end uses or supply sources. In the absence of more specific information

[83] *Altamont Gas Transmission Co. v. F.E.R.C.*, 965 F.2d 1098 (D.C. Cir. 1992) (upholding FERC's rejection of a certificate application on the ground that it did not show the availability of downstream facilities adequate to carry new load).
[84] *See, e.g., Ocean Advocates*, 402 F.3d at 871 (finding that the Army Corps failed to consider the potential for increased tanker traffic and oil spill and "acted arbitrarily and capriciously in failing to gather this quantifiable data").

relevant to environmental effects, FERC can and should make reasonable assumptions in order to conduct proper NEPA analysis and make an informed decision under section 7 of the Natural Gas Act.

When making its public convenience and necessity determination under the Natural Gas Act, the Commission currently permits applicants to rely on generic, default studies and information to justify market need.[85] Applicants are not required to provide evidence of specific contracts and agreements; and while applicants are free to do so, relying on such agreements to estimate emissions may *understate* total emissions because they represent only one narrow category of pipeline use: contracted firm capacity. When specific and reliable information on capacity, throughput, and emissions is provided by the applicant, it should be used in NEPA and Natural Gas Act analysis; but if such information is not comprehensive or reliable, it may be most appropriate to treat is as a lower bound estimate. When such information is *not* available, generic default studies and information can provide the Commission with information needed to evaluate alternatives under NEPA and to assess whether the project is in the public interest pursuant to Section 7 of the Natural Gas Act.

Federal case law makes clear that the lack of available information is not a license to assume that a project will have *no* reasonably foreseeable indirect effects. Courts have held that agencies need not have "perfect foresight when considering indirect effects," but that they must do their best to estimate those effects and cannot write them off as too speculative.[86] For example, in 2015, the U.S. District Court for the District of Colorado found that: "If OSM can

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[85] Policy Statement, at 25 (moving away from a requirement that applicants show actual contracts and permitting use of market studies, including "generally available studies by EIA or GRI, for example, showing projections of market growth").
[86] *See Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549 (8th Cir.2003) (stating, "[W]hen the *nature* of the effect is reasonably foreseeable but its *extent* is not ... the agency may not simply ignore the effect.").

predict how much coal will be produced, it can likewise attempt to predict the environmental effects of its combustion. Just because it does not possess perfect foresight as to the timing or rate of combustion or as to the state of future emissions technology does not mean that it can ignore the effects completely."[87]

Failing to make reasonable estimates of upstream and downstream greenhouse gas emissions wrongly treats a project's climate consequences as worthless and irrelevant. The Commission should therefore revise its Policy Statement to commit to using reasonable default assumptions and available tools to quantify and then monetize upstream and downstream greenhouse gas emissions. This section identifies reasonable assumptions and tools that would allow the Commission to develop reasonable estimates of the change in upstream and downstream greenhouse gas emissions that are the foreseeable consequences of a project, including:

- Default assumptions for estimating the amount of additional natural gas that will be produced upstream and combusted downstream;
- Emission factors to quantify the amount of greenhouse gas emissions that result from the production and combustion of the additional natural gas; and
- Tools to conduct substitution analysis to evaluate the relative change in greenhouse gas emissions if the additional transportation of natural gas displaces other energy sources.

Each of these are discussed in turn.

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[87] *WildEarth Guardians v. United States Office of Surface Mining, Reclamation & Enf't*, 104 F. Supp. 3d 1208, 1230–31 (D. Colo. 2015), *order vacated, appeal dismissed*, 652 F. App'x 717 (10th Cir. 2016); *see also Sabal Trail,* 867 F.3d at 1374 ("We understand that emission estimates would be largely influenced by assumptions rather than direct parameters about the project, but some educated assumptions are inevitable in the NEPA process. And the effects of assumptions on estimates can be checked by disclosing those assumptions so that readers can take the resulting estimates with the appropriate amount of salt." (citations and quotations omitted)); *High Country,* 52 F. Supp. 3d at 1196*; Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin*., 538 F.3d 1172, 1200 (9th Cir. 2008) (finding the agency's failure to monetize carbon emissions to be arbitrary and capricious and stating, "while the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero.").

A. FERC can use default assumptions as estimates for the amount of natural gas that will be produced upstream and combusted downstream.

In order to quantify foreseeable upstream and downstream greenhouse gas emissions associated with a pipeline project, the Commission will first need to estimate the amount of additional natural gas that will be transported by the pipeline and ultimately combusted. In order to facilitate predictable and orderly analysis, the Commission should use reasonable "default" assumptions regarding the amount of natural gas that will be transported and combusted in the absence of more credible information provided by project applicants and stakeholders.

As a default, upper-bound estimate, it is reasonable for FERC to assume that a pipeline will continuously transport 100 percent of its capacity, that all transported gas will be combusted, and that all combusted gas is additional and displaces no other fuels. The Commission has called this a "full burn" assumption.[88] Adopting a default, full burn assumption would place the burden on a certificate applicant to show that pipeline utilization will be less than 100 percent.

A full burn assumption is consistent with EISs and EAs prepared by other agencies. For example, in the State Department's final supplemental EIS for the Keystone XL Pipeline, the agency calculated the accumulated incremental lifecycle greenhouse gas emissions from the proposed pipeline based on "the maximum throughput of the proposed project (830,000 bpd), assuming operation over the full 365 days in a year."[89] The agency assumed both maximum throughput per day and constant year-round operation. Similarly, to assess the downstream emissions from combustion of coal produced at mines induced by the approval of a new coal rail line, the Surface Transportation Board "conservatively modeled coal production for each of the

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[88] *See, e.g.*, *Sabal Trail Remand*, 162 FERC ¶ 61,233 at P 24.
[89] U.S. State Dept., *Final Supplemental Environmental Impact Statement: Keystone XL Project* (2014), *supra* note 60 at Table 4.14-8.

proposed and potentially induced mines,"[90] based on "the total recoverable coal reserves" for each mine.[91]

Other agencies take a similar approach. For example, BLM and OSMRE prepared estimates of all environmental effects, including upstream and downstream emissions, associated with a coal mine expansion based upon "maximum allowable coal recovery."[92] The agencies acknowledged that "[u]ltimately, the *actual* produced, transported, and combusted coal would be dependent upon coal markets, alternative fuel markets (i.e., natural gas, tires, petcoke, industrial waste), and the coal supply at the mine," but stated that, "[f]or this [EA], a worst-case scenario of maximum allowable production limit of 1.3 million tons per year… and transport is assumed."[93] In a separate EIS, BLM analyzed the environmental effects from a proposed coal lease based upon "maximum potential annual coal production," and rail transportation emissions associated with the proposed coal lease "based on a maximum potential shipping rate of 2 million tons per year."[94] In addition, BOEM has assessed projected production levels and corresponding greenhouse gas emissions for its five-year offshore leasing program based upon "that portion of

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[90] *Tongue River DEIS, supra*, at F-33, available at https://www.stb.gov/decisions/readingroom.nsf/UNID/E7DE39D1F6FD4A9A85257E2A0049104D/$file/AppF_Lifecycle+GHG.pdf.

[91] *Tongue River DEIS, supra*, at C.3-13, *available at* https://www.stb.gov/decisions/readingroom.nsf/UNID/E7DE39D1F6FD4A9A85257E2A0049104D/$file/AppC_CoalProduction.pdf. The agency modeled three different overall coal production scenarios—low, medium, and high production—but for each mine calculates "the maximum annual coal production at each mine for the given production [scenario] level and route alternative." *Id*. at F-22; *see also id*. at C.3-23 (explaining that, across the three scenarios, it calculates a "more conservative maximum amount of Tongue River coal that could be induced (i.e., tending to overstate the production of Tongue River coal)."); *see also id*. at C.3-25 (estimating the number of trains per day by assuming 365 days per year of operation, and trains operating with the maximum number of coals and the maximum loads per car).

[92] *See* 2017 King II Mine EA at 5.

[93] *Id*.

[94] Bureau of Land Management, *Alton Coal Tract LBA Final EIS* at 4-78, 4-174, *available at* https://eplanning.blm.gov/epl-front-office/projects/nepa/79446/150899/185115/10_Alton_FEIS_Chapter_4_Environmental_Impacts_20180711.pdf.

the undiscovered technically recoverable oil and gas resources that could be explored, developed, and commercially produced at given cost and price considerations using present or reasonably foreseeable technology."[95]

Similarly, when issuing an air permit under the Prevention of Significant Deterioration and nonattainment provisions of the Clean Air Act, EPA evaluates a source's *potential* to emit—that is, the maximum emissions of a pollutant assuming the new or modified source operated at maximum design capacity continuously, 24 hours a day, 365 days per year.[96] Like mines and power plants, pipelines may be expected to operate at less than 100 percent capacity; but for assessing the potential environmental consequences of a new project, it is appropriate to analyze the maximum possible effect.[97]

In addition to adopting the full burn assumption as a default upper bound, the Commission could adopt an assumption that a project will transport *at least* the amount of natural gas equivalent to the subscribed firm capacity of the project. The Commission could also include an assumption that 98.35 percent of transported gas will be ultimately be combusted—that, is the national average percentage of natural gas that is combusted rather than used for non-combustion purposes.[98] Together, these assumptions could serve as a useful lower-bound

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[95] U.S. Bureau of Ocean Energy Mgmt., *OCS Oil and Natural Gas: Potential Lifecycle Greenhouse Gas Emissions and Social Cost of Carbon* 15 (2016), https://perma.Cc/2mxn-Qxbv.

[96] *See* U.S. Envtl. Protect. Agency, New Source Review Workshop Manual, app. C, at c.1 (1990), https://www.epa.gov/sites/production/files/2015-07/documents/1990wman.pdf.

[97] As a counter example, the Ninth Circuit has rejected analysis in an EIS that was based upon the lowest possible amount of oil that was economically viable to produce. *See Native Village of Point Hope v. Jewell*, 740 F.3d 489, 499-503 (9th Cir. 2014) (holding that BOEM "has not justified its choice of the lowest possible amount of oil that was economical to produce as the basis for its [NEPA] analysis.").

[98] EIA, Non-Combustion Use of Fossil Fuels 1980-2011 (2012), https://www.eia.gov/totalenergy/data/annual/showtext.php?t=ptb0115 (estimating about 1.65% of natural gas is not combusted). Other agencies have used this average estimate of the percent of natural gas that is not combusted. *See, e.g.*, BLM, *Draft Supplemental EIS: Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth 2 Development Project*, at Appendix H (2018), https://eplanning.blm.gov/epl-front-office/projects/nepa/65817/127980/155727/Appendix_H-

estimate of the quantity of natural gas that will be combusted downstream. Therefore, if a new pipeline project has held an open season and has precedent agreements or firm transportation agreements for 80 percent of its total capacity, the Commission could quantify the expected downstream emissions based on an assumption that 80% x 98.35% = 78.68 percent of the pipeline's capacity will be combusted. Some shippers may not use their firm capacity at all times, but these shippers can and do resell that capacity to those who can use it pursuant to the Commission's Capacity Release Program.[99] This estimate should be considered a default lower bound when estimating emissions because a significant amount of natural gas transported through pipelines is not firm capacity, but interruptible capacity that is not reflected in firm capacity contracts or precedent agreements.[100]

By including both default upper-bound and default lower-bound estimates, the Commission can provide a range of quantified emissions, determined using reasonable and predictable assumptions. Such a range provides useful context to inform the Commission's certification decision, and therefore would serve the purposes of both NEPA and the Natural Gas Act. Moreover, setting the lower-bound default emission estimate as a project's subscribed firm capacity can help counteract misaligned incentives that may cause an applicant to overstate the

_BOEM_Greenhouse_Gas_Lifecycle_Model_Methodology.pdf (using the estimate provided by EIA, Non-Combustion Use of Fossil Fuels 1980-2011 (2012), https://www.eia.gov/totalenergy/data/annual/showtext.php?t=ptb0115). Another EIA estimate places the non-combusted portion of total natural gas slightly higher, at just over 2%, *see* EIA, *Monthly Energy Review* tbl 1.11a (released June 26, 2018), https://www.eia.gov/totalenergy/data/monthly/pdf/sec1_22.pdf (also showing that only a small percentage of total natural gas is not combusted)—but in any case, the percentage is small. Some agencies have alternatively chosen to make a simplifying assumption that all fossil fuels transported by a project are ultimately combusted. *See* STB, *Tongue River DEIS*, *supra*, at F-32 (dismissing as "negligible" the portion of coal that goes to gasification or otherwise is not directly combusted, and assuming instead that all coal transported by a rail project is combusted for electricity generation).

[99] *See Promotion of a More Efficient Capacity Release Market,* Order No. 712, FERC Stats. & Regs. ¶ 31,284 (2008).

[100] *See* Tyler Hodge & Chris Cassar, *Natural Gas Power Plants Purchase Fuel Using Different Types of Contracts*, U.S. ENERGY INFO. ADMIN: TODAY IN ENERGY (Feb. 27, 2018), https://www.eia.gov/todayinenergy/detail.php?id=35112.

expected capacity demand when justifying the project for the purpose of the Commission's public need determination. However, as with the upper-bound default estimate based on a full burn scenario, the lower-bound default estimate based on firm capacity could be overcome by additional, reliable information provided by the certificate applicant or other parties to a pipeline certificate proceeding. For example, organizations could provide information showing that a pipeline is likely to operate at high capacity in the near term but gradually lower capacity as the natural gas end uses are replaced by new electric generating technologies, energy storage, and home appliances. Providing stakeholders the opportunity to more accurately estimate the amount of gas that will be transported by the project will further align incentives as the applicant justifies the project based on need and the Commission evaluates adverse environmental consequences of the project.

B. Once an estimated volume of natural gas is determined, FERC should use established emission factors to quantify the direct, upstream and downstream emissions associated with that natural gas.

Given reasonable assumptions about the amount of additional natural gas that will be produced, transported, and combusted, the Commission can use default emission factors to estimate the quantity of emissions that will result from that upstream production and downstream combustion.

For downstream emissions, the specific form of combustion and location of end use need not be known with certainty in order to develop reasonable estimates. Because natural gas transported by pipeline must conform to a relatively narrow band of characteristics, when pipeline gas is combusted it produces greenhouse gases at a relatively consistent rate.[101] EPA

[101] U.S. Envtl. Protect. Agency, Annex 2 Methodology and Data for Estimating CO_2 Emissions from Fossil Fuel Combustion at A74 to A76, https://www.epa.gov/sites/production/files/2018-

offers a single set of emission factors for carbon dioxide, methane, and nitrous oxide emissions from pipeline gas combustion, which FERC should use to quantify downstream emissions.[102] FERC, therefore, need only multiply its estimates of the amount of additional natural gas that will be combusted due to the pipeline by the emission factors provided by EPA to arrive at a reasonably foreseeable estimate of downstream greenhouse gas emissions.[103]

Of course, not all natural gas that is delivered to homes, businesses, and power plants will be combusted. Some amount will leak into the atmosphere. To the extent that the Commission has reliable information on downstream uses and leakage rates, it should use that information to develop more accurate emission estimates.[104] However, because uncombusted natural gas—predominantly methane—is an even more potent greenhouse gas than carbon dioxide,[105] using an assumption that natural gas is fully combusted produces a lower-bound estimate of climate damages.

Unlike local pollutants such as particulate matter, greenhouse gases are global pollutants. The location of emissions is unrelated to the magnitude of damage that will occur due to those emissions. Therefore, it is not necessary for the Commission to know whether natural gas will be

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01/documents/2018_annex_2.pdf (describing EPA's methodology for determining the carbon content of pipeline gas that will be released to the atmosphere when combusted). *See also* U.S. Envtl. Protect. Agency Center for Corporate Climate Leadership, Emission Factors for Greenhouse Gas Inventories (March 9, 2018), https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf (providing emission factors for CO_2, CH4, and N2O that results from natural gas combustion).

[102] *See id.; see also* EPA, Detailed Comments on FERC NOI for Policy Statement on New Natural Gas Transportation Facilities at 3, *Certification of New Interstate Natural Gas Facilities,* Docket No. PL18-01-000, (June 21, 2018) (EPA NOI Comments).

[103] *Id.* (providing a simple formulate for calculating downstream emissions); *see also Broad Run,* 163 FERC ¶ 61,190 at 2-3 (LaFleur, Comm'r, *concurring*) (explaining EPA's suggested methodology).

[104] *See Sabal Trail Remand*, 163 FERC ¶ 61,208 at P 25 & n. 57 (describing use of conservative fugitive methane leakage rate for power plants).

[105] U.S. Envtl. Protect. Agency, National Level U.S. Greenhouse Gas Inventory 1990-2016: Fast Facts at 3 (2018), https://www.epa.gov/sites/production/files/2018-04/documents/9509_fastfacts_20180410v2_508.pdf

combusted in particular homes, businesses, or power plants in order to estimate the climate consequences of that combustion. This distinguishes the appropriate level of environmental analysis when evaluating greenhouse gases with what may be required for evaluating other environmental consequences. In fact, in the Sabal Trail Supplemental EIS, FERC correctly acknowledged that downstream combustion emissions would result in identical greenhouse gas emissions regardless of the precise end point, stating: "Any project with a 1.1 bcf/day capacity serving a different set of states would result in a different percentage for context, despite *an identical contribution to climate change*."[106]

This approach is consistent with other agencies' NEPA analyses and legal precedent. BLM for instance, like FERC, often does not have perfect information on the end use of the resource at issue when it prepares ES and EISs. It makes an educated estimate based on the type of resource at issue and the narrow universe of possible end uses, all of which involve combustion of a fossil fuel resource and result in predictable levels of downstream greenhouse gas emissions. For example, in the 2017 EA prepared for a modification of the King II Mine in Colorado, BLM and OSMRE acknowledged that the bulk of the coal produced "will be combusted… potentially anywhere in northern Mexico and in the southwestern U.S."[107] While this made an accurate accounting of expected local criteria pollutants too difficult to include in the EA, BLM had no troubling disclosing and quantifying expected greenhouse gas emissions, which it did using emissions factors published by EPA.[108]

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[106] Final Supplemental Environmental Impact Statement at 6, *Florida Southeast Connection, LLC*, Docket Nos. CP-14-554-002, CP15-16-003, CP15-17-002 (2017) (emphasis added)
[107] 2017 King II Mine EA at 81.
[108] *Id*. at 81-83. *See also Keystone XL SDEIS, supra*, at 4.15-82 (using GHG emission factors modeled by the National Energy Technology Laboratory); *Tongue River DEIS, supra*, at F-4 (explaining that the Surface Transportation Board developed its own emission factors for downstream combustion of Tongue River coal).

For upstream greenhouse gas emissions, reasonable average emission factors are available that can be used to estimate the quantity of greenhouse gases that will be emitted by induced upstream natural gas production that is the reasonably foreseeable consequence of a proposed pipeline project. For example, EPA has highlighted a set of methods and emission factors that can be used to calculate the quantity of greenhouse gases emitted by oil and gas production wells, gathering lines, and processing that were developed to help industry meet its obligations for greenhouse gas reporting.[109] Alternatively, the Commission could return to its past practice of using generic estimates for upstream emissions from natural gas production developed by the Department of Energy's National Energy Technology Laboratory and Energy Information Agency.[110]

While there is some variation in emission rates among sources, production sources need not be known with certainty in order to be useful in the context of NEPA analysis. Even if the Commission and applicants do not know the exact wells that would be used to produce gas to supply a project, they may know the region from which natural gas will be supplied. Reasonable forecasting of emissions—including using national average or regional average emission rates—is required when tools such as those used in previous Commission orders are available.[111] As with assumptions about the volume the volume of gas to be transported, the Commission should make clear that it will consider any specific information provided by applicants and other stakeholders regarding leakage, flaring, and other upstream greenhouse gas emissions in place of

[109] EPA NOI Comments at 2 (discussing EPA regulations at 40 C.F.R. Part 98 Subpart W).
[110] *See New Market*, 163 FERC ¶ 61,128 at 2-3 & nn. 5-6 (LaFleur, Comm'r, *dissenting in part*) (identifying available tools and previous Commission orders utilizing those tools). *See also Tongue River DEIS, supra* at F-8, F-24, F-25, F-27 (calculating upstream greenhouse gas emissions from induced mine activity based on emission factors from BLM, EEPA, and Franklin Associates).
[111] *Sabal Trail,* 867 F.3d at 1374 ("NEPA analysis necessarily involves some 'reasonable forecasting,' and that agencies may sometimes need to make educated assumptions about an uncertain future") (quoting *Del. Riverkeeper Network v. FERC*, 753 F.3d 1304, 1310 (D.C. Cir. 2014)).

regional or national default emission factors. But even without stakeholder-provided information, use of a reasonable default estimates is better than leaving substantial emissions completely unquantified, thus treating them as non-existent. Doing so would result in a serious underestimate of likely environmental effects, as important, unquantified effects are often and ignored entirely.[112] On several occasions, courts have struck down administrative decisions for failing to give weight to non-monetized effects.[113] Most relevantly, in *Center for Biological Diversity v. NHTSA*, the U.S. Court of Appeals for the Ninth Circuit found it arbitrary and capricious to give zero value "to the most significant benefit of more stringent [fuel economy] standards: reduction in carbon emissions."[114]

C. Ideally, FERC should compare the relative emissions of energy substitutes, using a sophisticated, transparent model.

FERC has repeatedly assumed that if a particular transportation project is not approved, some other source of gas will enter the market as a perfect and costless substitute, such that the ultimate combustion of natural gas and associated emissions would be exactly the same.[115] This "perfect substitution" assumption is an irrational contradiction of basic economic principles and leads an agency to falsely assume that its project approvals have no impact on fossil fuel combustion and the related climate consequences.

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[112] Richard Revesz, *Quantifying Regulatory Benefits*, 102 Cal. L. Rev. 1424, 1434-35, 1442 (2014).
[113] *See id.* at 1428, 1434.
[114] 538 F.3d at 1199.
[115] *E.g. Sabal Trail Remand*, 162 FERC ¶ 61,233 at P 55 ("[T]he No Action Alternative would only eliminate one potential source of fuel but would not decrease the ultimate consumption of fossil fuel to satisfy demand for electricity or reduce GHG emissions. For example, the project's shippers might . . . seek[ ] the construction of other new facilities."); *New Market*, 163 FERC ¶ 61,128 at P 60 ("Nothing in the record supports the dissent's assertion that approval of transportation projects spurs the production of natural gas"); *Broad Run*, 163 FERC ¶ 61,190 at P 61 ("nothing in the record showing that specific end uses would not occur absent the proposed project facilities.").

Project applicants seek certificates of public convenience and necessity for particular transportation facilities because those particular facilities will generate the greatest profits for them. Other options for transporting natural gas are almost by definition more expensive for the applicant, or else those would be their preferred alternatives. Consequently, approving a particular project will lower the applicant's cost, and so lower the cost of supplying natural gas into the market.

Basic principles of supply and demand predict that lowering the cost of supply of a commodity like natural gas will increase the supply of that product; that increasing the supply of gas will lower the market price of gas to the consumer; and that lowering the price will lead to increased consumer demand for and consumption of that commodity.[116]

If the increased consumption of gas due to the increased supply from the transportation project displaces dirtier energy sources like coal, the net effect may be a decrease in greenhouse gas emissions; but if increased consumption of gas comes at the expense of energy conservation or of cleaner energy sources like renewables, the end result would be an increase in greenhouse gas emissions. The overall effect may vary with time, as the relative fuel mix of energy substitutes in the market changes. In the near term, gas may be somewhat more likely to displace coal; but in the longer term, as renewables continue to become price-competitive and increase their market share, gas competition against renewables may become increasingly the norm.

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[116] *See* N. Gregory Mankiw, *Principles of Economics* 74–78, 80–81 (5th ed. 2008). The Notice of Inquiry contains some confusing language on supply, demand, and price. FERC writes "Increases in both domestic and international demand for natural gas produced in the United States, combined with the availability of competitively-priced gas from shale reserves . . . have reduced prices . . . ." 83 Fed. Reg. at 18,025. It is hard to understand how an "increase in . . . demand" could have "reduced prices." For a commodity like natural gas, for a given amount of supply, an increase in demand would be expected to increase prices. Of course, the other effect that FERC mentions in that sentence, the increased supply from shale, would reduce prices.

Forecasting and balancing out all these mixed environmental consequences requires a sophisticated model.

Multiple courts have recognized the need for agencies to assess such demand effects and energy substitution patterns in their environmental impact statements. Most recently, the U.S. Court of Appeals for the Tenth Circuit explained that it is irrational for an agency to fail to consider how, if its action will help increase the supply of fossil fuels, then the price for that commodity will also drop, demand will rise, and greenhouse gas emissions will increase.[117] In another notable case, the U.S. Court of Appeals for the Eighth Circuit sharply criticized the Surface Transportation Board for "illogical[ly]" concluding that approving new railroad lines to Powder River Basin coal mines would not affect the demand for and consumption of coal, and for ignoring "widely used" models capable of forecasting such effects.[118] On remand, the Board undertook just such a study using the Energy Information Administration's (EIA) National Energy Modeling System (NEMS) . . . '[which] not only forecasts coal supply and demand but also quantifies environmental impacts.'"[119]

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[117] *WildEarth Guardians v. Bureau of Land Management*, No. 15-8109 at 24 (10th Cir., Sept. 15, 2017) ("this perfect substitution assumption [is] arbitrary and capricious because the assumption itself is irrational (i.e., contrary to basic supply and demand principles)."). *See also Ctr. for Sustainable Economy v. Jewell*, 779 F.3d 588, 609 (D.C. Cir. 2015) ("forgoing additional leasing on the [outer continental shelf] would cause an increase in the use of substitute fuels such as renewables, coal, imported oil and natural gas, and a reduction in overall domestic energy consumption from greater efforts to conserve in the face of higher prices"); *Montana Envtl. Info. Ctr.*, 2017 WL 3480262, at *15 (holding that it was "illogical" for the agency to assume that choosing not to approve federal coal leases would have no effect on coal supply, demand, or consumption, because "other coal would be burned in its stead"); *High Country Conservation Advocates*, 52 F. Supp. 3d at 1197 (recognizing that increased production of coal could affect "the demand for coal relative to other fuel sources, and coal that otherwise would have been left in the ground will be burned" (quotation marks omitted)).

[118] *Mid States Coal. for Progress v. Surface Transp. Bd.,* 345 F.3d 520, 549-50 (8th Cir. 2003).

[119] *Mayo Found. v. Surface Transp. Bd.*, 472 F.3d 545, 555 (8th Cir. 2006). *See also Tongue River DEIS*, *supra*, at C.1-13 to 1-14 (conducting a substitution analysis, though ultimately finding that the new coal rail line would not change delivered coal prices enough to increase total demand for coal).

Several models exist to assess substitution effects.[120] NEMS, developed by the EIA, has been used by the Surface Transportation Board, as described above. NEMS models the energy economic in detail, but that detail does add some complexity and so reduces transparency. BOEM has used some inputs from NEMS to develop its own model, MarketSim, which simplifies the details and focuses on oil and gas. BOEM has used MarketSim to conduct substitution analysis of offshore oil and gas leases for several decades.[121] The Bureau of Land Management has also started using MarketSim recently,[122] perhaps in response to the Tenth Circuit's ruling that failure to consider energy substitution effects is irrational. Other models have various advantages and disadvantages, such as the Integrated Planning Model (IPM) developed by ICF International, which, as a proprietary model, lacks transparency. As one final example, the State Department commissioned EnSys Inc. to apply its World Oil Refining Logistics & Demand Model to the Keystone XL Pipeline environmental review. In the draft supplemental environmental impact statement, the State Department reported that "If all such pipeline capacity were restricted . . . the incremental increase in cost . . . could result in a decrease in production . . . associated with a decrease in greenhouse gas emissions in the range of

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[120] *See generally* Peter Howard, *The Bureau of Land Management's Modeling Choices for the Federal Coal Programmatic Review* (Policy Integrity Report, 2016), http://policyintegrity.org/publications/detail/BLM-model-choice (explaining the criteria for assessing the usefulness of different models to conduct substitution analysis).

[121] Bureau of Ocean Energy Mgmt., Dep't of Interior, *Draft Environmental Impact Statement: Liberty Development Project* at 4-50 (Aug. 2017); *see also* Bureau of Ocean Energy Mgmt, *Proposed Final Outer Continental Shelf Oil & Gas Leasing Program 2012-2017*, 110 (2012) (calculating that if the offshore acreage were not leased, 6% of the forgone oil and gas would be replaced by energy conservation). *See generally* Amicus Brief of the Institute for Policy Integrity, *WildEarth Guardians v. BLM*, No. 15-8109, at pp.19-24 (10th Cir., submitted Feb. 5, 2016), http://policyintegrity.org/documents/10th_Cir_BLM_Brief.pdf (detailing the history of BOEM's use of MarketSim).

[122] BLM, *Draft Supplemental EIS: Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth 2 Development Project*, Appendix H (2018), https://eplanning.blm.gov/epl-front-office/projects/nepa/65817/127980/155727/Appendix_H-_BOEM_Greenhouse_Gas_Lifecycle_Model_Methodology.pdf.

0.35 to 5.3 MMTCO2e annually."[123] FERC could use one of these existing models or could develop or commission a model specifically designed for the gas pipeline context.

If fully modeling substitution effects is not feasible, FERC will have to make a reasonable default assumption. Some default assumptions that FERC has made in the past are, in fact, not reasonable. As explained above, courts have held, in parallel contexts, that an assumption of perfect substitution is irrational. FERC has also recently proposed a "net potential-to-emit scenario" analysis. Unfortunately, that approach is over-simplified to the point where it risks being seriously misleading. In the net potential-to-emit analysis, FERC has started with the potential-to-emit levels of pollution from new natural gas power plants that a new pipeline project will serve, and then subtracted out the full potential-to-emit from retiring coal plants that are ostensibly being displaced by the pipeline.[124] However, it is not clear that coal plant retirements can always be attributed wholly to the approval of a single pipeline, and it is not clear that the coal plant's retirement would be the only effect in the energy market. For example, the net potential-to-emit analysis does not seem to consider near-term or long-term effects of gas displacing renewable energy or energy conservation.

Therefore, the only remaining and most reasonable default assumption to make in lieu of modeling is to assume no substitution. In other words, the default assumption in lieu of modeling should be that all the gas transported by the pipeline is additional into the market, without offsetting any other resource. This assumption—though somewhat unlikely under near-term market conditions given the current competition between coal and natural gas—provides a useful upper-bound estimate of the greenhouse gas emissions. Furthermore, the assumption is

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[123] U.S. State Dept., *Draft Supplemental Environmental Impact Statement for the Keystone XL Pipeline* at 1.4-2 (2012), https://keystonepipeline-xl.state.gov/documents/organization/205654.pdf.
[124] FERC, *Final Supplemental Environmental Impact Statement for the Southeast Market Pipelines Project* at 4-6 (2018).

consistent with assumptions that FERC routinely makes to calculate the economic benefits of projects. For example, when FERC reports the regional tax revenue from a project or other "long-term benefits to the local and regional economy,"[125] the agency does not discuss how those taxes or other benefits would come at the expense of other taxes from other development opportunities in the region. In a dynamic and robust economy, investment in and employment at one construction project will divert labor and capital from other construction opportunities.[126] Yet when FERC calculate tax revenue and other economic benefits in its environmental assessments, it does so on a gross, not a net basis. Therefore, it is consistent to also calculate gross emission increases under a no substitution default assumption.

V. The Commission Should Consider Adopting a More Holistic Cost-Benefit Analysis Framework for Evaluating Projects Under the Natural Gas Act.

The Commission's assessment of whether a project is required by the public convenience and necessity would benefit from a more systematic evaluation of the public interest. The current Policy Statement describes the Commission's task as "a flexible balancing process during which it weighs the factors presented in a particular application."[127] The Commission explains that this balancing process involves directly comparing the benefits of a project with at least some of the costs and proceeding to environmental review only if "the benefits outweigh" those costs.[128] As explained above, environmental considerations—at least those that are easily monetizable like greenhouse gas emissions—should be incorporated into this economic test.

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[125] *E.g.*, FERC, *Final Environmental Impact Statement for Southeast Market Pipelines Project* at 3-185 to 3-214 (2015).
[126] *See generally* Policy Integrity, *The Regulatory Red Herring: The Role of Job Impact Analyses in Environmental Policy Debates* 4-6 (2012) (explaining how in a dynamic labor market with low unemployment, new employment at one project will come at the expense of employment elsewhere in the market), http://policyintegrity.org/files/publications/Regulatory_Red_Herring.pdf.
[127] Policy Statement, 88 FERC ¶ 61,227 at 14.
[128] Policy Statement, 88 FERC ¶ 61,227 at 19 ("Only when the benefits *outweigh* the adverse effects on economic interests will the Commission then proceed to complete the environmental analysis") (emphasis added).

But, even in this initial economic test, FERC does not make a determination that benefits outweigh costs using any particular methodology or process.

The Commission should adopt the suite of tools that economists have developed and that agencies generally use to evaluate whether the benefits of a particular action will outweigh the costs: cost-benefit analysis. The Office of Management and Budget provides a set of best practices and guidance for agency use of cost-benefit analysis: OMB Circular A-4. While Circular A-4 is primarily intended to aid agencies conduct cost-benefit analysis in the context of regulatory decisions and is not *required* to be used by independent agencies such as FERC,[129] its reasoning and best practices can nonetheless be useful to the Commission as it considers the best approach to evaluating the impact of certificate applications.[130] As OMB Circular A-4 states, cost-benefit analysis "provides a formal way of organizing the evidence on the key effects—good and bad—of the various alternatives that should be considered."[131]

There are many reasons cost-benefit analysis would be an appropriate decision framework for the public convenience and necessity test. First, cost-benefit analysis is particularly useful for picking the most economically rational choice among a set of options. As OMB explains, "where all benefits and costs can be quantified and expressed in monetary units, benefit-cost analysis provides decision makers with a clear indication of the most efficient alternative, that is the alternative that generates the largest net benefits to society (ignoring

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[129] Office of Mgmt and Budget, Exec. Office of the Pres., Circular A-4 on Regulatory Analysis at 1 (2003), https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf [hereinafter Circular A-4] (explaining that purpose of Circular A-4 is to assist agencies conducting regulatory analysis that is required by Executive Order 12866, which does not apply to independent regulatory agencies).
[130] *See Cape Hatteras Access Preservation Alliance v. U.S. Dept. of Interior*, 344 F.Supp.2d. 108, 130 (D. D.C. 2004) (using Circular A-4 to evaluate the Department of Interior's approach to critical habitat designation).
[131] Circular A-4 at 1-2.

distributional effects).”[132] By studying and estimating the consequences of an action, putting those consequences into a common metric of dollars, and identifying the option that maximizes net benefits, cost-benefit analysis would allow the Commission to rationally and confidently balance the tradeoffs inherent in any certificate proceeding. Moreover, because the Commission has already committed to an approach that weighs costs and benefits, cost-benefit analysis merely acts as a transparent and systematic tool for accomplishing its goals. When used properly, cost-benefit analysis can cut down on the influence of ideology and special-interest politics. It facilitates sound analysis, evidence-based decisionmaking, and a pragmatic approach to government action. Cost-benefit analysis helps decisionmakers recognize the relative magnitude of consequences while minimizing the risk that the Commission leans too heavily on individual, salient factors or succumbs to unintended bias in favor of or in opposition to individual projects or the expansion of natural gas infrastructure more broadly. Armed with a tool that recognizes the trade-offs that are an inherent part of its certificate choices, the Commission can demonstrate its willingness to take seriously the divergent interests of multiple stakeholders and to make hard choices that recognize the real and meaningful costs of a project, while nonetheless facilitating those infrastructure projects that will maximize social welfare.

If the Commission decided to adopt cost-benefit analysis as part of its section 7 process, it would anticipate, describe, quantify, and, when possible, monetize the positive and negative consequences of the project and relevant alternatives. Circular A-4 provides detailed guidance for how agencies can think about each of these steps.[133]

The use of expert judgment by individual Commissioners is, of course, important for weighing the variety of interests that are implicated by a new pipeline project. It may not be

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[132] Circular A-4 at 2.
[133] *See generally* Circular A-4 at 14-42.

possible to quantify and monetize all benefits and costs of a pipeline project. But cost-benefit analysis can be paired with approaches that allow agencies to incorporate unquantified benefits and costs into their decisionmaking.[134] Therefore, the Commission can continue to apply its expert judgment when ultimately deciding on pipeline applications, but with the help and transparency of cost-benefit analysis.

In order to use cost-benefit analysis as a decision framework when evaluating projects under section 7 of the Natural Gas Act, the Commission should evaluate and monetize the following categories of costs and benefits.

The economic value of the additional natural gas that a project brings to market. One of the key benefits of additional natural gas pipeline service is the ability to facilitate the consumption of additional natural gas. In order to quantify the amount of additional natural gas that will be brought to market as the result of a pipeline, the Commission can use the same approach it uses when quantifying greenhouse gases. As described above, this can include upper bound and lower bound default assumptions, information provided by stakeholders, and sophisticated tools that model the natural gas system under particular conditions. The Commission can then monetize the value of the increased natural gas (as compared to the no action alternative baseline) using current and projected future prices of natural gas.[135]

The economic value of reduced gas prices. Construction of new projects that bring additional natural gas to market can provide benefits to consumers, including those that do not

[134] *See* Circular A-4 at 27 (describing how agencies can approach decisions in the face of benefits and costs that are difficult to quantify); *id.* at 2 (describing, "break-even analysis" as a tool agencies can use to harmonize expert judgment about unquantified costs and benefits with more traditional cost-benefit analysis).
[135] *See* Circular A-4 at 19- (describing the benefits of using market prices as the best estimate of consumer willingness-to-pay); U.S. Energy Info. Agency, Annual Energy Outlook 2018 at 64 (2018), https://www.eia.gov/outlooks/aeo/pdf/AEO2018.pdf (describing natural gas price projections).

purchase the new gas. When additional natural gas is available, the price of natural gas in a region is reduced and consumers of that gas see benefits by paying lower prices for each unit of natural gas.[136] The price effect of introducing additional natural gas to an area can be monetized using a number of the tools and models described in Parts II and III above. Note, however, that new pipeline capacity in one region can increase the price of natural gas in other regions. To the extent modeling shows such countervailing cost increases, the Commission should take them into account in any cost-benefit analysis.

Cost of pipeline construction, operation, and maintenance. One primary direct cost of a new natural gas pipeline project is the economic cost of constructing, maintaining and operating the pipeline, compressor station, or other project element. The cost of land acquisitions or the value of land acquired through eminent domain would also be included in this category. These costs would be provided by the applicant or estimated using aggregate data.

Costs of greenhouse gas emissions. Because the climate damage caused by greenhouse gas emissions is not location-dependent and tools for monetizing those damages (i.e., the social cost of greenhouse gases) are available, the cost of greenhouse gas emissions can be incorporated into the cost-benefit analysis of a proposed project. The Commission can do so using the tools and methodologies described throughout these comments and should include both the direct and indirect greenhouse gas emissions associated with a project.[137]

Potential benefits of displacing greenhouse gas emissions. To the extent that a natural gas project facilitates the displacement of higher emitting fuels such as coal or oil, the project may cause a reduction in greenhouse gas emissions. The extent of emission reductions can be

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[136] *See* U.S. Energy Info. Agency, Natural Gas Explained: Natural Gas Prices (Oct. 31, 2017), https://www.eia.gov/energyexplained/index.php?page=natural_gas_prices (describing factors influencing consumer gas prices, including pipeline capacity).
[137] Policy Integrity, Joint Comments on the Social Cost of Greenhouse Gases, *supra* note 7.

estimated using the tools described in Part IV.C. The economic value of those reduced emissions can then be monetized using the social cost of greenhouse gases and counted as a benefit of the project.

Additional benefits and costs. Some costs and benefits may be more difficult to quantify or monetize, including:

- The value of difficult to measure or difficult to monetize environmental damage, such as public health damage caused by direct and indirect local air pollution; the risk of land or water contamination due to natural gas production, pipeline construction, and accidents; loss of threatened or endangered species; and other environmental consequences.

- Other economic consequences of pipeline construction on community land values and the tax base.

When monetization is possible, these costs and benefits can be directly included in a cost-benefit analysis. When it is not possible, the Commission should describe these costs and benefits qualitatively. It can then exercise its expert judgment to evaluate the extent to which unmonetized costs and benefits are significant enough to change the Commission's decision regarding whether a project is in the public interest.

In short, cost-benefit analysis can be a useful tool as the Commission wrestles with its politically contentious statutory responsibility to evaluate whether new pipeline projects are required by the public convenience and necessity. By systematically and transparently quantifying and comparing the costs and benefits of pipeline projects, the Commission can evaluate proposed projects and alternatives through an economically rational, politically accountable, and more predictable process.

Respectfully submitted,

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