



Institute *for*
Policy Integrity

NEW YORK UNIVERSITY SCHOOL OF LAW

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U.S Bureau of Land Management
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Re: Comments on Arctic Coastal Plain Draft EIS submitted by the Institute for Policy Integrity at NYU School of Law

The Institute for Policy Integrity (“Policy Integrity”) at New York University School of Law¹ respectfully submits these comments on the Draft Environmental Impact Statement (“DEIS”) prepared by the Bureau of Land Management (“BLM”) with respect to a possible oil and gas leasing program within the Arctic National Wildlife Refuge Coastal Plain (“Coastal Plain”).² 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 explain that development of oil and gas in the Arctic Coastal Plain would pose serious threats to this delicate, unspoiled ecosystem and would contribute significantly to climate change. With respect to the DEIS, Policy Integrity makes the following comments:

- The Arctic National Wildlife Refuge (“ANWR”) has been off limits for oil and gas development for almost 60 years. Many of the same characteristics that made it a prime candidate for protection decades ago are just as compelling if not more so today.
- The DEIS fails to analyze several viable alternatives, including alternatives raised during the scoping phase, that would reduce environmental and social harms more than BLM’s identified alternatives. Among the alternatives that BLM should have considered are one or more environmentally-protective development scenarios that would lease *only* the minimum acreage mandated by the Tax Act, and scenarios that

¹ This document does not purport to present New York University School of Law’s view, if any.

² See U.S. Dep’t of Interior, Bureau of Land Mgmt., *Coastal Plain Oil and Gas Leasing Program Draft EIS* (Dec. 2018), <https://www.blm.gov/programs/planning-and-nepa/plans-in-development/alaska/coastal-plain-eis> (hereinafter, “Draft EIS”).

would impose more stringent and cost-benefit justified lease stipulations, timing restrictions, and infrastructure limitations.

- The DEIS fails to analyze a delayed leasing alternative that would account for the option value (also known as the informational value of delay) of irreversible drilling within Refuge, as suggested by Policy Integrity at the scoping phase. A delayed leasing alternative would analyze postponing leasing until BLM has more information on oil and natural gas prices, environmental risks and sensitivities, drilling and emergency response infrastructure, competing land uses, and more—and then use that valuable information to subsequently make decisions with respect to leasing that would better maximize public welfare.
- BLM’s energy substitution analysis contains methodological flaws, omissions, and limitations that produce an underestimate of downstream greenhouse gas emissions from the proposed leasing. Meanwhile, BLM inconsistently fails to apply any substitution analysis to its projections of projected oil and gas production and related government revenue and other economic effects, and thereby misleadingly overinflates the proposed action’s alleged economic benefits. The inconsistent treatment of economic benefits versus climate costs is arbitrary.
- Outside experts project that the Coastal Plain has relatively little economically-recoverable oil and gas and will deliver far less revenue than some government estimates suggest, weighing against leasing in this area.
- BLM fails to quantify any ecosystem service values, non-use values, or passive use values. Failure to quantify an otherwise quantifiable environmental cost effectively treats that environmental cost as worthless, and is arbitrary when the agency chooses, as BLM does here, to monetize the action’s alleged economic benefits.

The comments that follow provide more detail on each of these points.

I. The Arctic Coastal Plain is a pristine wildlife refuge with a long history of bipartisan support.

ANWR, including its Coastal Plain, has been off limits for oil and gas development for almost 60 years. Many of the same characteristics that made it a prime candidate for protection decades ago are just as compelling if not more so today.

In 1953, government scientists conducted a comprehensive survey of potential conservation areas in Alaska. Their report, “The Last Great Wilderness,” identified the undisturbed northeast corner of Alaska, now home to the Refuge, as the best candidate for protection given its unspoiled terrain and biodiversity.³ In 1960, President Eisenhower first designated nearly 19 million acres as the Arctic National Wildlife Range in order “to

³ U.S. FISH & WILDLIFE SERV., POTENTIAL IMPACTS OF PROPOSED OIL AND GAS DEVELOPMENT ON THE ARTIC REFUGE’S COASTAL PLAIN: HISTORICAL OVERVIEW AND ISSUES OF CONCERN (2000), http://arcticcircle.uconn.edu/ANWR/anwr_fws.htm.

preserve unique wildlife, wilderness and recreational values.”⁴ In 1980, Congress re-designated much of the area as permanently protected wilderness under the Alaska National Interest Lands Conservation Act (“ANILCA”).⁵ ANILCA provided four purposes that guide management of the Refuge: to conserve animals and plants in their natural diversity, ensure a place for hunting and gathering activities, protect water quality and quantity, and fulfill international wildlife treaty obligations.⁶

Protecting the Arctic Refuge has been a national priority with strong bipartisan support ever since its establishment.⁷ For decades, Congress has voted against allowing oil and gas leasing within the Refuge’s borders.⁸ The reason for this support is simple: ANWR is America’s largest pristine wildlife refuge. It is home to polar bears, grizzly bears, wolves, wolverines, muskoxen, porcupine caribou, among many other wildlife species.⁹ Among its grandeurs, the Refuge contains five different ecological zones, including lagoons, wetlands, forests, mountains and tundra. The Coastal Plain is often described as the heart of the Refuge: a vital area for wildlife breeding and host to nearly 200 species of migratory birds.¹⁰ The Coastal Plain is also designated as critical habitat for polar bears pursuant to the Endangered Species Act.¹¹ The Arctic Refuge also confers important benefits as a carbon sink that offsets the current and future impacts of climate change.

Notwithstanding the Coastal Plain’s unique characteristics and long history of bipartisan support, the 2017 Tax Act directs BLM to hold two oil and gas lease sales (of no less than 400,000 acres each) in the 1.5 million acres located in the Coastal Plain area of the Refuge within 10 years of the passage of the Act, with the first lease sale to be held within four years and the second sale within seven years.¹²

Drilling for oil or natural gas within the Coastal Plain would pose numerous uncertainties and present significant risks of environmental damage, including oil and natural gas spills, habitat effects, and more. In the EIS, BLM must evaluate all of these potential effects, as well as infrastructure effects, climate change effects, and more. Given

⁴ Public Land Order 2214, 25 Fed. Reg. 12598 (Dec. 6, 1960); U.S. Fish & Wildlife Serv., *About the Arctic National Wildlife Refuge*, <https://www.fws.gov/refuge/Arctic/about.html> (last visited June 18, 2018).

⁵ Alaska National Interest Lands Conservation Act, Pub. L. No. 96-487, 94 Stat. 2371 (1980).

⁶ U.S. Fish & Wildlife Service, U.S. Fish & Wildlife Serv., *supra* note 3.

⁷ See Letter from Republican Congressmen, to Diane Black, Chairman, U.S. House Comm. on the Budget, and John Yarmuth, Ranking Member, U.S. House Comm. on the Budget (June 22, 2017), available at https://reichertforms.house.gov/uploadedfiles/letter_to_budget_committee_on_anwr_drilling.pdf (opposing any language that would open ANWR to leasing in the fiscal year 2018 Budget Resolution).

⁸ *Id.*

⁹ M. LYNNE CORN ET AL., CONG. RESEARCH SERV., RL33872, ARCTIC NATIONAL WILDLIFE REFUGE (ANWR): A PRIMER FOR THE 114TH CONGRESS 2 (2015),

https://digital.library.unt.edu/ark:/67531/metadc503538/m1/1/high_res_d/RL33872_2015Mar17.pdf.

¹⁰ U.S. Fish & Wildlife Serv., *Arctic National Wildlife Refuge: Climate Change and its Impacts*, <https://www.fws.gov/refuge/arctic/climatechange.html> (last visited June 18, 2018).

¹¹ LAURA B. COMAY ET AL., CONG. RESEARCH SERV., RL33872, ARCTIC NATIONAL WILDLIFE REFUGE: AN OVERVIEW 18-20, (2018), <https://fas.org/sgp/crs/misc/RL33872>.

¹² Tax Cuts and Jobs Act of 2017, Pub.L. No. 115-97, 131 Stat. 2054 (2017), https://eplanning.blm.gov/epl-front-office/projects/nepa/102555/141879/174233/Tax_Act.pdf.

the Coastal Plain’s myriad sensitivities, in this DEIS, BLM must analyze viable alternatives that would be more environmentally protective than the alternatives presented.

II. The DEIS fails to analyze several viable alternatives that would reduce environmental and social harms more than BLM’s identified alternatives.

The DEIS fails to analyze several viable alternatives, many of which were raised at the scoping phase, that would reduce environmental and social harms more than BLM’s identified alternatives. For instance, the DEIS should have analyzed one or more environmentally-protective development scenarios that would offer for lease *only* the minimum acreage mandated by the Tax Act. The DEIS also should have analyzed alternatives that would have required more stringent, cost-benefit-justified infrastructure limitations, lease stipulations, and timing restrictions. And as described in Part III, the DEIS should have analyzed alternatives that would delay lease sales to fully capture the informational value of delay. These alternatives were raised in Policy Integrity’s scoping comments to BLM, as well as in comments by non-governmental organizations at the scoping phase.

NEPA regulations specify that the agency must “[r]igorously explore and objectively evaluate all reasonable alternatives,” including those “reasonable alternatives not within the jurisdiction of the lead agency,” so as to “provid[e] a clear basis for choice among the options.”¹³ The agency must also analyze alternatives that are, in fact, distinct.¹⁴

A. The DEIS fails to analyze an alternative that would offer for lease *only* the required acreage set forth in the Tax Act.

The Tax Act requires that BLM hold two lease sales by 2024, and that it offer for lease “not fewer than 400,000 acres area-wide in each lease sale,” of “those areas that have the highest potential for the discovery of hydrocarbons.”¹⁵ Strictly following the language of the Tax Act suggests that Congress has at most required BLM to offer somewhere between 400,000 and 800,000 acres for lease: a first lease sale must include 400,000 acres minimum, but any tracts that do not receive bids in the first sale could be re-offered in the second sale; thus, a second sale would only have to include somewhere between 0 and 400,000 new acres.

Yet BLM never seriously considers any alternative that would only lease up to a maximum of 800,000 acres total. In the DEIS, Alternatives B and C would each offer 1,563,500 acres for lease, and Alternatives D1 and D2 would offer 1,037,200 acres each—an enormous increase over what Congress stipulated.¹⁶ Further, Alternative A, the no

¹³ 40 C.F.R. § 1502.14.

¹⁴ See *Muckleshoot Indian Tribe*, 177 F.3d 800, 813 (9th Cir. 1999) (NEPA analysis failed to consider reasonable range of alternatives where it “considered only a no action alternative along with two virtually identical alternatives”); *Wilderness Society v. Wisely*, 524 F. Supp. 2d 1285, 1312 (D. Colo. 2007) (BLM violated NEPA by failing to consider “middle ground compromise between the absolutism of the outright leasing and no action alternatives”).

¹⁵ Tax Cuts and Jobs Act of 2017, Pub. L. No. 115-97, 131 Stat. 2054 (2017), https://eplanning.blm.gov/epl-front-office/projects/nepa/102555/141879/174233/Tax_Act.pdf.

¹⁶ Draft EIS at ES-3.

action alternative under which no leasing would be held, is “included for comparison only,” and BLM never seriously considers adopting Alternative A.¹⁷

BLM treats Alternatives D1 and D2 as the more environmentally-protective alternatives, yet they each offer the same total acreage for lease, which far exceeds the Tax Act’s statutory minimum acreage. Given the environmental sensitivities of leasing and development in ANWR’s Coastal Plain, BLM should have analyzed an alternative that would offer *no more than* 800,000 acres total for lease. BLM fails to provide a reasonable explanation for why it did not do so.

BLM briefly states that it considered an alternative that would offer 800,000 acres total, but rejected this scenario because areas of high hydrocarbon potential (“HCP”) in the Coastal Plain total only 427,900 acres, and therefore, it would be necessary to include areas of medium and low HCP as eligible for leasing.¹⁸ First, as explained above, depending on how many tracts are unsold after the first lease-sale, 427,900 acres of high HCP land could be sufficient to fulfill BLM’s statutory charge under the Tax Act. Moreover, BLM’s rationale fails to explain why the agency could not offer *only* as much medium-potential land as necessary to reach the 400,000-acre per lease sale requirement. The DEIS states that an estimated 427,900 acres of the program area have high potential for petroleum resources, 658,400 acres have medium potential, and 477,200 acres have low potential.¹⁹ Therefore, it is not necessary for BLM to offer *any* low potential lands for leasing in order to meet the Tax Act mandate, and it need not offer all of the medium potential lands either. Finally, because BLM’s various action alternatives all plan to offer more than 800,000 acres, BLM’s approach only exacerbates the problem it identifies of offering medium- and even low-HCP lands.

Given the well-documented problems of BLM leasing low-potential lands in other regions of the country (therefore depleting their conservation value),²⁰ BLM should make every effort to not lease *any* low or medium-potential lands in the pristine Coastal Plain. Elsewhere in the United States, 36 million acres of federal lands are currently leased for oil and gas production, but only 12.6 million acres (36%) are in production, and the oil and gas industry has more than 6,700 unused approved drilling permits.²¹ Leasing low- and medium-potential lands in ANWR’s Coastal Plain, when so much federal lands is already earmarked for production yet undeveloped, is irrational and irresponsible. The oil and gas industry leases land that it does not ultimately drill because it recognizes the option value of holding those leases. By leasing more land than BLM has to, the agency transfers the public’s valuable option value to private industry, without have analyzed the option value in the first place.²²

BLM further states that considering an 800,000 acre (or lower) alternative is unnecessary as it would be “similar in concept” to Alternatives D1 and D2, which make

¹⁷ DEIS at Abstract.

¹⁸ DEIS at 2-39.

¹⁹ *Id.* at ES-3.

²⁰ THE WILDERNESS SOCIETY, OPEN FOR BUSINESS at 2.

²¹ THE WILDERNESS SOCIETY, OPEN FOR BUSINESS at 2.

²² Michael Livermore, *Patience is an Economic Virtue*, 84 U. COLO. L. REV. 581 (2013).

1,037,200 acres available for lease sales.²³ However, developing an additional 237,000 acres—or, in the case that many of the tracts remain unsold after the first lease-sale and could be offered again in the second lease-sale, up to 637,000 acres—some or all of which has low or medium oil potential, risks subjecting a pristine land area larger than New York City (all five boroughs) to oil and gas development, when not Congressionally required. These are not “similar” alternatives.

In short, the DEIS fails to analyze a reasonable alternative that would offer for lease *only* the required acreage set forth in the Tax Act—an alternative suggested by environmental groups at the scoping phase.²⁴

B. BLM should analyze alternatives that would require more stringent lease stipulations and timing restrictions, including stipulations that would be cost-benefit justified.

In addition to analyzing alternatives that would offer less total acreage for lease—only the minimum amount required by Congress—BLM also failed to analyze alternatives that would impose more stringent stipulations on leases and development, including stipulations that would be cost-benefit justified and increase public welfare.

Some of the alternatives in the DEIS do impose some timing stipulations, such as seasonal restrictions to avoid habitat effects; no-surface occupancy stipulations; and a few other conditions. However, alternatives D1 and D2 are very similar to each other, in some cases presenting identical stipulations or very minor differences between them, and so BLM has failed to meaningfully assess a range of reasonable alternatives.

For example, BLM does not assess more stringent stipulations to requiring methane capture techniques in the oil and gas development and operations that would prevent wasteful and harmful methane leaks and flaring. Such stipulations are especially appropriate in light of the agency’s recent repeal and weakening of various methane capture requirements.²⁵ Whatever BLM may now think about its statutory authority to require methane capture by rule, BLM clearly has authority to require stipulations to particular leases and has the obligation under NEPA to consider reasonable alternatives. Similarly, whatever BLM may now think about the cost-benefit calculus for a general requirement for methane capture, in 2015 the agency concluded that methane capture

²³ DEIS at 2-39.

²⁴ See, e.g., scoping comments submitted by Alaska Wilderness League, et al. (June 18, 2018), <https://naturecanada.ca/wp-content/uploads/2018/06/Arctic-Refuge-Leasing-EIS-Scoping-Comments-FINAL.pdf> (“BLM should provide a thorough discussion of whether the alternatives do, in fact, involve the minimal amount of public lands necessary to accomplish the purpose of the use...”).

²⁵ BLM, Waste Prevention, Production Subject to Royalties, and Resource Conservation; Rescission or Revision of Certain Requirements, 83 FED. REG. 49,184 (2018) (rescinding key provisions of the 2017 Waste Prevention Rule, including: 1) waste minimization plans, 2) gas-capture percentages, 3) well drilling requirements, 4) well completion and related operations requirements, 5) pneumatic controller requirements, 6) pneumatic diaphragm pump requirements, 7) storage vessel requirements, and 8) leak detection and repair requirements).

requirements would be massively cost-benefit justified,²⁶ and BLM has the responsibility under NEPA to consider such reasonable stipulations here.

BLM also failed to consider other possible stipulations that would protect the fragile ANWR ecosystem and reduce other environmental effects, such as:

- More stringent time restrictions with respect to critical habitat;
- More stringent stipulations concerning land use disturbance, such as more no-surface occupancy stipulations;
- More stringent stipulations concerning seismic exploration surveys; and more.

An environmentally-protective alternative that BLM should consider would lease only the minimum acreage required in the Tax Act, with reasonable stipulations, including NSO clauses, methane capture requirements, and others noted by environmental organizations and members of the public.²⁷

III. BLM must analyze delayed leasing alternatives in order to account for the option value of irreversible drilling within the Refuge.

As previously explained, NEPA requires agencies to consider even “reasonable alternatives” that are “not within the jurisdiction of the lead agency.”²⁸ This makes sense given that NEPA’s “purpose is not merely to force the *agency* to reconsider its proposed action, but, more broadly, to inform *Congress*.”²⁹ Just as the DEIS is required to assess a no-action, no-leasing alternative, regardless of the instructions of the Tax Act, in order to provide a useful analytical “comparison,”³⁰ BLM must also analyze other reasonable delayed leasing options, to enable analysis of the significant option value that the other various action alternatives under consideration all forgo, to provide information on that forgone option value to Congress, and so that BLM will give meaningful consideration to the maximum delay options allowed under its statutory authority.

BLM failed to analyze one or more delayed leasing alternatives that would account for the option value (also known as the informational value of delay) of irreversible drilling within the Refuge, as suggested by Policy Integrity at the scoping phase.³¹ A delayed leasing alternative would analyze postponing lease sales—to the very end of the statutory deadline or even beyond it—until BLM has more information on environmental risks and sensitivities, oil and natural gas prices, drilling and emergency response infrastructure, competing land uses, and more. BLM could then use the valuable information gained during

²⁶ See the various comments from Policy Integrity to BLM on its rescission and revision of certain waste prevention requirements, *available at* <https://policyintegrity.org/projects/update/comments-on-the-rescission-of-blms-waste-prevention-rule>.

²⁷ See, e.g., scoping comments submitted by Alaska Wilderness League, et al. (June 18, 2018), <https://naturecanada.ca/wp-content/uploads/2018/06/Arctic-Refuge-Leasing-EIS-Scoping-Comments-FINAL.pdf>.

²⁸ Cf. 40 C.F.R. § 1502.14.

²⁹ E.g., *Natural Res. Defense Council v. Hodel*, 865 F.2d 288, 296 (D.C. Cir. 1988) (second emphasis added).

³⁰ DEIS at Abstract.

³¹ Comments on Arctic Coastal Plain EIS Scoping submitted by the Institute for Policy Integrity at NYU School of Law, 11-16 (2018).

the delay to subsequently make decisions with respect to leasing that would better maximize public welfare.

BLM is required by law to manage federal fossil fuels to earn “fair market value” for the public and to harmonize energy production with resource conservation.³² In furtherance of these legal mandates, the Coastal Plain EIS must address the alternative of delaying any lease sale until *at least* the very end of the four-year and seven-year statutory deadlines, when BLM will have more information on oil and natural gas prices, environmental risks and sensitivities, drilling and emergency response infrastructure, climate change effects, and competing potential land uses.

In addition, BLM should analyze the alternative of holding any lease sales *later than* these statutory deadlines. Analyzing an alternative that would hold lease sales 10 years after passage of the Tax Act (in 2027) would be a reasonable alternative given the Tax Act’s general directive for the Secretary of the Interior to conduct two lease sales “not later than 10 years after the date of enactment of this Act,” notwithstanding the four-year and seven-year schedule also contained in the Act.³³ Moreover, a third delayed leasing alternative—to delay the lease sales even *beyond the statutory deadline*, to perhaps 15 or 20 years in the future—is also a reasonable alternative for BLM to analyze given that such an alternative could generate more total revenue for the public from higher bids, lower production costs due to technology advances, and higher total royalties given resource price projections (with oil prices expected to rise through 2050, as explained below). NEPA requires consideration of alternatives “that are practical or feasible” and not solely “whether the proponent or applicant likes or is itself capable of carrying out a particular alternative”; in fact, “[a]n alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable.”³⁴

Congress should be interested in all of these alternatives if its goal is to maximize revenue; if BLM conducts an alternatives analysis that evaluates these alternatives, Congress may very well learn that the deadlines it set in the Tax Act are counterproductive in terms of optimizing revenue, and that the deadlines ignore the substantial environmental and social benefits of waiting to drill in a fragile, untested ecosystem. Analyzing such strategic timing alternatives is necessary in order to determine the optimal time to hold potential lease sales in order to secure the public’s right to obtain “fair market value” for its resources and to minimize the environmental risks that will be assessed throughout the EIS process.³⁵

A. There is option value to delaying drilling in the Refuge.

Option value is the informational value of delaying irreversible decisions, such as when and on what terms to sell non-renewable resources to private companies.³⁶ BLM

³² 43 U.S.C. §§ 1344(a)(3)-(4); §§ 1701(a)(8)-(9).

³³ Tax Cuts and Jobs Act of 2017, Pub. L. No. 115-97, 131 Stat. 2054 (2017).

³⁴ COUNCIL ON ENVIRONMENTAL QUALITY, Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations, Questions 2A and 2B, available at <http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm>; 40 C.F.R. §§ 1502.14, 1506.2(d).

³⁵ See Hein, *Federal Lands and Fossil Fuels*, *supra* note **Error! Bookmark not defined.**

³⁶ Michael Livermore, *Patience is an Economic Virtue*, 84 U. COLO. L. REV. 581 (2013).

holds, on behalf of the American public, a perpetual option to develop or lease its fossil fuel resources. When the government sells the right to develop a tract to a private lessee, it extinguishes the perpetual option that it holds on behalf of the American people, and sells a time-limited option to a private actor, valid for the duration of the lease (typically 10-15 years). Consideration of option value requires that BLM determine when and where exercising its perpetual options would be most socially opportune, including by accounting for environmental, social, and economic ramifications.³⁷ The value associated with the option to delay can be large, especially when there is a high degree of uncertainty about the underlying resource's market value, the extraction costs, and the social and environmental costs imposed by drilling—all of which are present here with respect to the Coastal Plain.

Even if BLM does not account for option value in its timing decisions, oil and gas companies will, and they will time extraction and resource decisions in a manner that is privately optimal, rather than socially optimal. Indeed, option value explains the routine practice of companies purchasing tracts and waiting years to develop them, when conditions are optimal from their perspective.³⁸ BLM must strategically time its own lease sales in order to maximize social welfare.

In fact, the federal government uses option value in other resource management determinations. Interior's Bureau of Ocean Energy Management ("BOEM") incorporated option value in its offshore oil and gas leasing program for 2017-2022. BOEM stated that: (i) environmental and social cost uncertainties can affect the size, timing and location of leasing; (ii) option value can be a component of the "fair market value" of a lease; and (iii) BOEM can raise minimum bids, rents and royalties for leases to account for option value.³⁹ BOEM also uses a "hurdle price" analysis to ensure that any areas included in its leasing program are expected to earn positive net economic value.

Importantly, BOEM cited option value as a key reason for scheduling certain offshore lease sales in the Alaskan region as late as possible in its five-year schedule of future lease sales—directly in line with our suggestion in these comments that BLM should consider delayed lease alternatives in this proceeding.⁴⁰ In its Draft Proposed Program for 2017-2022, published in 2015, BOEM explained:

*To that extent, there may be option value in waiting to drill while the research is being performed. This was partly the rationale supporting the 2012–2017 Program decision for scheduling Alaska lease sales late in the program while environmental studies are being conducted. It is conceivable that the wait for information could extend beyond the 5-year timeframe of a given leasing program, and the pyramidal structure of the Program development process allows for more refined research and analysis at the specific lease sale stage.*⁴¹

³⁷ *Id.*

³⁸ *Id.*

³⁹ U.S. BUREAU OF OCEAN & ENERGY MGMT., 2017-2022 OUTER CONTINENTAL SHELF OIL AND GAS LEASING DRAFT PROPOSED PROGRAM at 5-20, 8-3-8-19 (2015), <https://perma.cc/8AU3-7MS4>.

⁴⁰ *Id.*

⁴¹ *Id.* at 8-10.

In addition to scheduling Arctic lease sales as late as possible given environmental and other uncertainties, BOEM flagged the potential to cancel those lease sales altogether if new information supported removing them. And in fact, the Obama Administration did ultimately cancel those Arctic offshore lease sales through other means, by invoking section 12(a) of the Outer Continental Shelf Lands Act to withdraw the areas from future offshore leasing.

The U.S. Court of Appeals for the D.C. Circuit has also confirmed that option value is a valid consideration in federal resource extraction decisions.⁴² Recognizing the informational value of waiting for more information before drilling, the D.C. Circuit stated:

More is learned with the passage of time: Technology improves. Drilling becomes cheaper, safer, and less environmentally damaging. Better tanker technology renders oil tanker spills less likely and less damage. The true costs of tapping OCS energy resources are better understood as *more becomes known about the damaging effects of fossil fuel pollutants.* Development of energy efficiencies and renewable energy sources reduces the need to rely on fossil fuels. As safer techniques and more effective technologies continue to be developed, the costs associated with drilling decline. There is therefore a tangible present economic benefit to delaying the decision to drill for fossil fuels to preserve the opportunity to see what new technologies develop and what new information comes to light.⁴³

In line with past agency practice and federal case law, environmental and economic uncertainty overwhelmingly support waiting to lease in the Arctic until more is known about the likely effects of drilling. Otherwise, the federal government is giving up the American people's option value in the resources and transferring the option to private industry without sufficient analysis of how accounting for the informational value of delay could help the agency maximize public welfare.

B. Given the potential for devastating, irreversible damage if BLM were to lease in the Coastal Plain, the EIS must consider delayed leasing alternatives.

The Tax Act's statutory deadlines, by which BLM must hold two leases, fail to account for option value and disregard BLM's federal obligations under NEPA and FLPMA. BLM must include alternatives in its EIS that would hold any such lease sales: (1) at the very end of the statutory deadline, and (2) beyond the strict statutory deadline, in order to provide Congress and other decisionmakers with analysis of the option value that could be gained from gathering better information on environmental risks, resource prices, infrastructure, and more.⁴⁴ These delayed leasing alternatives are especially relevant

⁴² *Center for Sustainable Economy v. Jewell*, 799 F.3d 588, 610-11 (D.C. Cir. 2015), [https://www.cadc.uscourts.gov/internet/opinions.nsf/AFCFA76C2EEDB01385257E0000563225/\\$file/12-1431-1540911.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/AFCFA76C2EEDB01385257E0000563225/$file/12-1431-1540911.pdf).

⁴³ *Id.* (emphasis added).

⁴⁴ See COUNCIL ON ENVIRONMENTAL QUALITY, Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, Questions 2A and 2B, available at <http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm>; 40 C.F.R. §§ 1502.14, 1506.2(d).

where, as here, BLM may make an irreversible decision that could result in drilling in the pristine environment of the Coastal Plain, and economic data also supports waiting to drill due to resource price uncertainty.

Given the potential for irreversible damage, the scope of the Coastal Plain EIS must include delayed leasing alternatives that would allow BLM to collect and analyze more information on the following uncertainties before determining the scope, location, and terms for any sale:

- Current and expected resource prices in the U.S. and in global energy markets;
- Environmental conditions and risks from drilling, including local pollution, habitat effects, and greenhouse gas emissions;
- Current and expected effects of climate change on the fragile ecosystem of the Coastal Plain, which affect environmental sensitivities;
- Information on the cost of drilling in the Arctic and bringing those resources to market;
- Oil spill response, safety, and drilling technologies;
- Energy efficiency, energy conservation, and fuel economy standards that affect fossil fuel demand;
- Laws and regulations governing drilling and development on public lands, air pollution, endangered species, and other environmental concerns; and
- Competing uses of the Refuge and Coastal Plain, including recreational activities, preservation, scientific, cultural and tribal use.

Moreover, BLM should also analyze an alternative that would place strict conditions on any future development of leases, such as delaying all development by any lease holders until more information on environmental, social, and economic uncertainties can be obtained, and placing stringent limitations on surface disturbance. The myriad uncertainties listed above weigh strongly towards delaying any lease sales, as well as imposing strict conditions on any leases that may be obtained in the future.

Resource price uncertainty is one of many factors that counsels towards delayed leasing. When prices are volatile and uncertain, there is value in waiting for more information.⁴⁵ The latest Annual Energy Outlook from the U.S. Energy Information Administration (EIA) reports that “future oil prices are highly uncertain”: certain “international conditions” have the potential to “drive prices to extreme, sustained deviations from the Reference case price path,” and “extraction technologies and practices” for tight oil and shale gas “continue to evolve rapidly”⁴⁶; EIA also reports “inherent uncertainty about market dynamics” for ANWR production,⁴⁷ as well as key uncertainties throughout Alaskan production, including “untested” offshore potential.⁴⁸ All that price uncertainty creates option value, which BLM have failed to

⁴⁵ Michael Livermore, *Patience is an Economic Virtue*, 84 U. COLO. L. REV. 581, 610-12 (2013).

⁴⁶ EIA, Annual Energy Outlook 2019 at 32.

⁴⁷ *Id.* at 46.

⁴⁸ EIA, Oil and Gas Supply Module 14 (2019), <https://www.eia.gov/outlooks/aeo/assumptions/pdf/oilgas.pdf>.

consider. Instead, BLM’s entire analysis “assum[es]...favorable market prices,”⁴⁹ even though BLM admits the “uncertainties” over “future prices of oil and gas.”⁵⁰ It is unreasonable to BLM to base its entire analysis across all alternatives on an assumption of continuing favorable prices, when a framework exists—option value—to consider the value of waiting for more information in the face of great uncertainty over market prices. BLM can and should consider these price uncertainties by considering an option value alternative.

There is also great uncertainty with respect to the results of drilling in this area. As the DEIS states:

there is tremendous uncertainty regarding.... the remoteness and lack of previous exploration and development of the Coastal Plain as well as its harsh environment and challenging engineering considerations, and the extended time it has taken to go from leasing to development in other regions of the North Slope of Alaska including in the National Petroleum Reserve-Alaska (NPR-A).⁵¹

Recent federal oil and gas lease sales also show that industry demand for Coastal Plain leases is very uncertain, and may be low in the near term. In a 2017 auction for lease tracts in the National Petroleum Reserve in Alaska, just seven bids were received, covering about 80,000 acres—less than 1 percent of the 10.3 million acres offered, suggesting low and uncertain demand for new leases in this region.⁵² Uncertainty over extraction costs and technological development are also likely to be high given the harsh conditions in the area and lack of experience in the area, and this uncertainty also creates option value.⁵³

Further, there remains a great deal of uncertainty about the ecosystems and wildlife within the Refuge and Coastal Plain, including how susceptible they are to human disturbance, such as oil and gas exploration and production. More scientific study is needed to understand how oil and gas development in this fragile environment could affect wildlife, ecosystems, and more. Indeed, many species that call the Coastal Plain home are already threatened or endangered—polar bears have critical breeding ground in the Coastal Plain itself—and adding development and pollution may have devastating, permanent consequences including species loss. Among the many important environmental characteristics that the DEIS admits are currently uncertain or unknown are the subsurface flow paths to perennial springs that could be disturbed by drilling and fracking,⁵⁴ the nesting distribution of eider populations (because the program area has not been surveyed),⁵⁵ the population trends of ringed seals,⁵⁶ and the number and location of

⁴⁹ DEIS at 3-2.

⁵⁰ DEIS at 3-1.

⁵¹ DEIS at 1-1.

⁵² Yereth Rosen, “Alaskan oil lease sale brings few bids despite vast territory offered,” REUTERS (Dec. 6, 2017).

⁵³ Livermore, *supra* note 45, at 612-14.

⁵⁴ DEIS at 2-6.

⁵⁵ DEIS at 3-86.

⁵⁶ DEIS at 3-130.

grizzly and polar bear dens that might be disturbed by drilling.⁵⁷ Lease sales and development must be delayed until these environmental consequences are better understood.⁵⁸ Uncertainty also exists over the chance of oil spills, the potential development of technologies to mitigate the risks of oil spills and other damages from drilling, environmental sensitivity of the region, and the valuation of environmental and social costs—all of these uncertainties over environmental and social costs create option value, which BLM has failed to assess or weigh in its decisions.⁵⁹

In addition, it is uncertain what the full impacts of climate change will be in the region, and how climate change will affect the environmental risks of drilling. The U.S. Geologic Survey notes these ecosystem and wildlife uncertainties:

Predicted warming trends for the future will continue to alter plant growth, ice thaw, and other basic landscape processes. These changes will undoubtedly result in different responses by wildlife (fish, birds, and mammals) and the food they rely upon (plants, invertebrates, and fish). However, the type of response by different wildlife populations and their habitats – either positively or negatively – remains largely unknown.⁶⁰

Scientists also seek out the Refuge to study general impacts of climate change, including how plant and wildlife adopt to a warming climate—unknown information that will be important to overall U.S. efforts to address climate change.

IV. BLM’s energy substitution analysis is flawed and inconsistently applied, leading to a significant underestimate of emissions and an inflation of economic benefits.

Basic principles of supply and demand predict that increasing the supply of a commodity like oil or gas will lower prices, and that lower prices will lead to increased demand for and consumption of that commodity.⁶¹ If the increased consumption of oil and gas due to the increased supply from the Coastal Plain comes at the expense of energy conservation, or reduces use of cleaner energy sources like renewables, the end result would be an increase in greenhouse gas emissions. BLM acknowledges these principles of supply and demand and, to its credit, does attempt to model these energy substitution dynamics, using the MarketSim model developed by the Bureau of Ocean Energy Management (BOEM). Note, however, that BLM has not posted for public review the

⁵⁷ DEIS at 3-146.

⁵⁸ In addition, the government should consider estimating a quantitative value for risks to threatened and endangered species, by for example, placing a monetary value on biodiversity loss and species loss.

⁵⁹ See Livermore, *supra* note 45, at 605-09.

⁶⁰ US DEPT. OF INTERIOR, US GEOLOGIC SURVEY, ALASKA SCIENCE CENTER, https://alaska.usgs.gov/science/interdisciplinary_science/cae/arctic_coastal_plain.php.

⁶¹ See N. Gregory Mankiw, *Principles of Economics* 74–78, 80–81 (5th ed. 2008).

documentation for its substitution analysis⁶² to its ePlanning docket.⁶³ To provide an opportunity for meaningful public review as required by NEPA, BLM should make all data, models, and runs of its substitution analysis available and reopen public comment.

Unfortunately, BLM's energy substitution analysis contains serious methodological flaws, omissions, and limitations that produce a significant underestimate of downstream greenhouse gas emissions from the proposed leasing. Meanwhile, BLM inconsistently fails to apply any substitution analysis to its estimates of projected oil and gas production, or related government revenue and other economic effects, and thereby misleadingly overinflates the proposed action's alleged economic benefits. The inconsistent treatment of economic benefits versus climate costs is arbitrary.

A. BLM's substitution analysis omits effects on foreign consumption and so grossly underestimates net downstream emissions from proposed leasing

BLM reports that, according to its analysis, reducing the supply of oil and gas under the no action alternative by up to 10 billion barrels of oil and 2.4 TCF of natural gas will only reduce total demand for oil and gas by 3.9%.⁶⁴ Instead, BLM predicts that over 80% of the forgone oil and gas from Coastal Plain will be offset by increased foreign imports of oil and gas.⁶⁵

First, we have been unable to reproduce these results using the copies of MarketSim 2016 and documentation of MarketSim 2017 that are available to us. The challenges of reproducing and critiquing BLM's analysis are compounded by the fact that BLM has not made available as part of its public docket on ePlanning the complete runs of its energy substitution analysis. Indeed, we only obtained the summary document, labeled "BOEM 2018a" in the DEIS, by specific e-mail request. BLM must make the full energy substitution analysis available to the public to fulfill the requirement for meaningful public review under NEPA.

Nevertheless, it is apparent from the DEIS and the few supporting documents that are available that BLM's substitution analysis is limited to assessing the change in demand in the U.S. market only. The DEIS admits that "the Market Sim model considers only the U.S. supply and demand for petroleum; thus, the accuracy of the change (increase) in petroleum demand estimated from Market Sim projections is limited, given its scope is just the U.S. market," and the DEIS also explains that "without the Coastal Plain production, *U.S. oil demand* would be . . . 3.9 percent lower for the high-end production case."⁶⁶ Even though the DEIS tries to assert that its conclusions apply to both "US (and likely global)

⁶² See DEIS at 3-7 (citing to a document labeled "BOEM 2018a"); *id.* at References-9 (citing to BOEM 2018a, "Market Substitutions and Greenhouse Gas Downstream Emissions Estimates for BLM's Coastal Plain Project. Bureau of Ocean Energy Management, white paper. Sterling, VA").

⁶³ <https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage¤tPageId=152110>

⁶⁴ DEIS at 3-7; BOEM, *Market Substitution and Greenhouse Gas Downstream Emissions Estimates for BLM's Coastal Plain Project* tbl. 2 (2018) [referred to by the DEIS as BOEM 2018a].

⁶⁵ BOEM 2018a, *supra*, at tbl. 2

⁶⁶ DEIS at 3-7 (emphasis added).

production,”⁶⁷ documentation on MarketSim from BOEM concedes that “the reduction in foreign consumption of oil and gas in a no action analysis is not taken into account.”⁶⁸

That omission is both significant and arbitrary given that, as BOEM also admits, MarketSim actually *can* “estimate a foreign reduction in consumption . . . for oil.”⁶⁹ For example, according to BOEM’s runs of MarketSim in the context of its offshore oil and gas leasing program, in the mid-price scenario, taking 8 billion barrels of U.S. oil production off the global market would result in “a reduction in foreign oil consumption of approximately . . . 4 . . . billion barrels of oil.”⁷⁰ Our runs of MarketSim 2016 confirm this conclusion that a decrease of 1 unit of U.S. production may be associated with about a 0.5 unit reduction in global consumption.⁷¹ That 50% effect is significantly more than the 3.9% drop in U.S. demand that BLM reports. Because BLM’s estimates of the net downstream emissions of the proposed leasing compared with the no action alternative depend on this energy substitution analysis, the significant omission of any substitution effects on global consumption translates into a massive underestimate of the net downstream emissions.⁷²

The MarketSim documentation tries to assert that “excluding the foreign oil and gas market is reasonable” because “BOEM does not have information related to which countries would consume less oil” and so cannot make predictions about the changes in net emissions from changes in foreign consumption.⁷³ Yet the Department of the Interior never explains why it could not make a reasonable assumption about average emissions from total foreign consumption of oil. The MarketSim documents claim that “oil is consumed in a variety of products, which have a wide range of emissions factors,”⁷⁴ and yet the emissions factors for oil that BLM has used elsewhere show a rather manageable range of between a low of 5.72 kilograms of carbon dioxide per gallon to a high end of 14.64 kilograms per

⁶⁷ DEIS at 3-7.

⁶⁸ BOEM, OCS Oil and Natural Gas: Potential Lifecycle Greenhouse Gas Emissions and Social Cost of Carbon at 23 (2016). Note that this document is relied upon in BOEM 2018a, which in turn is what the DEIS relies upon.

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ See also P. Erickson & M. Lazarus, *Would Constraining U.S. Fossil Fuel Production Affect Global CO2 Emissions? A Case Study of US Leasing Policy*, Climatic Change 1-14 (2018) (finding that a one unit decrease in U.S. oil production decreases annual global production by 0.61 units); *id.* (“In particular, several studies find this ratio to be about 0.5, an outcome that would occur whenever supply and demand elasticities are equal in magnitude, since in that case, a supply shock would be accommodated by equal and opposite changes to production and consumption (Fæhn et al. 2017; Metcalf 2016; Wolfovsky and Anderson 2016).”); G. Metcalf, *The Impact of Removing Tax Preferences for U.S. Oil and Gas Production* (Council on Foreign Relations, Aug. 2016) (finding a global response of about 0.5 decrease per 1 unit of forgone U.S. production when matching the assumptions used in MarketSim, while also noting that hidden assumptions in MarketSim may lead global production to fall by even more than that, especially depending on the assumption on how OPEC will respond).

⁷² Note that, because greenhouse gases are global pollutants, foreign emission directly impact U.S. welfare. For the purposes of NEPA analysis, the location of the point of emission does not matter: any significant emissions of greenhouse gases attributable, directly or indirectly, to the action of a federal agency, must be assessed.

⁷³ *Id.*

⁷⁴ *Id.* at 22.

gallon.⁷⁵ BLM could easily apply either EIA tables of U.S. exports by petroleum product,⁷⁶ or could simply give a lower-bound estimate of the net emissions effect.⁷⁷ Either option would be much more accurate and reasonable than a complete omission. Meanwhile, “emissions factors for natural gas do not vary,” and so there would be no bar to calculating emissions reductions from a global drop in the consumption of gas. The Department of the Interior’s hesitation to make assumptions about foreign oil and gas consumption also stands in stark contrast to other extreme—and, frankly, most likely unreasonable—assumptions that underlie MarketSim, such as the assumed “near constant demand” for oil and gas “over the next 40-70 years.”⁷⁸

The assumption that the no action alternative for the Coastal Plain will have no effect on foreign consumption of oil and gas is also inconsistent with other claims made by the Department of the Interior. For example, former Interior Secretary Zinke routinely linked leasing the Coastal Plain area to President Trump’s strategy for “an energy-dominant America,”⁷⁹ and President Trump has linked drilling in ANWR to America’s energy exports.⁸⁰ Similarly, the DEIS reports that “The State of Alaska is pursuing a plan to build a liquid natural gas transport pipeline from the North Slope to markets in Asia. The Chinese oil industry has expressed interest in partial funding of the project in exchange for a share of gas from the pipeline. Additionally, memoranda of understanding to sell gas to companies in Japan, South Korea, and Vietnam have been secured.”⁸¹ And while the pipeline may initially transport gas from other fields in the North Slope, there is an expectation that this pipeline—with secured foreign consumers and potential foreign investors—could “eventually include natural gas from the Coastal Plain.”⁸² Yet BLM’s energy substitution analysis assumes that at no point in the next 70 years will a decrease in U.S. production under the no action alternative affect foreign consumption of oil or gas. That assumption is unrealistic given EIA’s projections that the United States will be a net energy exporter of both oil and gas from 2020 through at least 2040.⁸³

Indeed, how the energy substitution analysis considers natural gas consumption overall is somewhat murky. On the one hand, the DEIS claims that “For natural gas, the

⁷⁵ See BLM, Greater Mooses Tooth 2 SEIS, Appendix H, table 4-2.

⁷⁶ https://www.eia.gov/dnav/pet/pet_move_exp_dc_NUS-Z00_mbb1_a.htm

⁷⁷ BLM might also need to make some other reasonable assumptions about foreign substitutes for oil and gas consumption if those effects are not already modeled in the MarketSim. See Erickson & Lazarus (2018), *supra*, making a reasonable assumption that the alternative energy mix is about 85% as carbon intensive as oil-based fuels, and calculating the effect on global emissions of a change in U.S. oil supply.

⁷⁸ BOEM, Potential Lifecycle, *supra*, at 20.

⁷⁹ E.g., <https://www.doi.gov/pressreleases/blm-alaska-releases-draft-environmental-impact-statement-coastal-plain-oil-and-gas>

⁸⁰ See <https://www.whitehouse.gov/briefings-statements/remarks-president-trump-national-republican-congressional-committee-march-dinner/> (transitioning from talking about “ANWR in Alaska, one of the great sites of energy in the world” to saying “We are now an exporter of energy. Can you believe that?”).

⁸¹ DEIS at B-17.

⁸² DEIS at 3-6.

⁸³ EIA, Annual Energy Outlook 2019 at 12 (“The United States becomes a net energy exporter in 2020 and remains so throughout the projection period as a result of large increases in crude oil, natural gas, and natural gas plant liquids (NGPL) production coupled with slow growth in U.S. energy consumption.”); *id.* at 14.

analysis assumes the production eventually makes its way to the US or global market”⁸⁴; but on the other hand, the MarketSim documentation insists that “MarketSim does not model natural gas fluctuations in the global market” and so “the reduction in foreign consumption of . . . gas in a no action analysis is not taken into account,”⁸⁵ and concludes that “For gas consumption, BOEM does not have information related to how changes in the U.S. market would affect other countries.”⁸⁶ BLM needs to clarify what effects it is including or excluding.

Overall, by excluding potentially significant changes in foreign demand for oil and gas in response to a decrease in U.S. supply under the no action alternative, BLM may be massively underestimating the net downstream emissions of the proposed leasing.⁸⁷

B. Flaws and limitations in MarketSim’s applicability counsel in favor of developing a new model before finalizing the environmental impact analysis

BLM admits various important flaws and limitations in how MarketSim has been applied to the Coastal Plain leasing proposal. In particular, the application of MarketSim to Coastal Plain assumes that onshore production will have identical substitutes as offshore production, and does not allow any substitution involving new offshore production. The latter is obviously unrealistic and the former may be as well, and by better adapting MarketSim to the onshore leasing context, the substitution analysis could produce significantly different results.

Additionally, the application of MarketSim to the Coastal Plain leases calculates only downstream emissions and omits any upstream emissions.⁸⁸ While the DEIS does calculate some direct emissions from the upstream “construction, drilling, production, processing, and transportation” of oil and gas from Coastal Plain,⁸⁹ the substitution analysis apparently does not calculate comparable upstream emissions from substitute energy sources. For the sake of completeness and accuracy, that omission should be rectified in any final analysis. However, in correcting that omission, BLM must be sure to address two other issues at the same time. First, the DEIS also currently omits any quantification or monetization of the climate damages from methane leaks. The DEIS admits this omission with respect to methane leaks “during the drilling, production, processing and transport *of natural gas*,”⁹⁰ though there could also be significant methane leaks during the drilling, production, processing, and transport *of oil* which are also not currently accounted for in the DEIS. The DEIS speculates that methane leaks from gas production could be “roughly 5 percent of the estimate indirect emissions from combustion”—which would be a significant increase. Yet

⁸⁴ DEIS at 3-7.

⁸⁵ BOEM, Potential Lifecycle, *supra*, at 23.

⁸⁶ *Id.*

⁸⁷ See, e.g., P. Erickson, Final Obama administration analysis shows expanding oil supply increases CO2, Stockholm Environment Institute (Jan. 30, 2017) & P. Erickson, U.S. Again Overlooks Top CO2 Impact of Expanding Oil Supply . . . But That Might Change, Stockholm Environment Institute (Apr. 30, 2016) (calculating that forgoing 8.3 billion barrels of U.S. offshore production will decrease global consumption by 4 billion barrels and decrease global emissions by 1.7 billion metric tons).

⁸⁸ BOEM 2018a, *supra*, at 1.

⁸⁹ DEIS at 3-6.

⁹⁰ DEIS at 3-8 (emphasis added).

the DEIS never actually quantifies, let alone monetizes, the methane leaks from gas, and says nothing of methane leaks from oil production. These errors should be rectified in combination with any broader refinements to the calculation of upstream and direct emissions.

Second, BOEM's lifecycle emissions component of MarketSim has traditionally attributed large upstream emissions to the no action alternative, by assuming that forgone oil and gas production will be offset by large increases in imports, and by calculating large emissions from international tankers.⁹¹ Indeed, here, BLM calculates that about 80% of forgone production will be offset by increased foreign imports. That estimate seems high, and we have been unable to replicate that figure through our own study of MarketSim. BLM needs to provide fuller documentation of its analysis so the public can review this estimate. Perhaps the high estimate for offsetting imports is related to the omission of the effect on foreign demand, as discussed above. Regardless, there obvious problems with the assumption that 80% of forgone production will be offset by increased foreign imports. For one, MarketSim assumes that "other oil producing countries will supply" this offsetting production "without additional restraints," which BLM admits is a "highly uncertain" assumption about the effects on foreign production of this U.S. leasing decision.⁹² MarketSim does not, for example, consider whether OPEC countries will behave competitively or not, nor does it consider possible global regulatory changes in response to climate change. It is also unclear how to square this 80% import estimate with EIA projections that the United States will be a net exporter—projections that EIA made both before and after the moratorium on drilling in ANWR was lifted, thus suggesting that the status of the United States as a net exporter does not depend on the production from ANWR.⁹³ BLM's use of MarketSim also assumed that a decrease in onshore Alaskan production could not be offset by an increase in new offshore U.S. production, which is an unrealistic assumption and may have arbitrarily increased the portion of substitutes assigned to foreign imports. BLM should model all significant direct, indirect, upstream, and downstream emissions from the proposed leasing action and from substitution energy sources under the no action alternative, but should not selectively pick and choose which categories of emissions to model or not. If BLM does not address these issues, a selective calculation of the non-downstream emissions from a substitution analysis could skew the comparison of the no action alternative versus the leasing proposals.

BOEM and BLM are aware of these limitations and "are currently working with a contractor to adapt the MarketSim specifically to BLM's needs."⁹⁴ That is a step in the right direction, but any revision of MarketSim and new analysis of the environmental effects of the Coastal Plain leasing should be republished for public comment before finalizing any impact statements or leasing decisions. Additionally, BOEM and BLM should use this opportunity to address some important errors and limitations in MarketSim itself, beyond the application of the model to the onshore context. Given the significance of correcting for

⁹¹ BOEM 2018a, *supra*, at 12.

⁹² *Id.*

⁹³ Compare EIA AEO2019 (projecting net exports and also modeling ANWR production) with AEO2018 (projecting net exports, and not mentioning ANWR, as it was still subject to moratorium).

⁹⁴ BOEM 2018a, *supra*, at 2.

some of these errors—such as the potential 50% effect on foreign consumption, as discussed above—BOEM and BLM should complete a revision of MarketSim, with a full opportunity for public input, before finalizing this or any other analyses of leasing decisions.

Many of the “key assumptions”⁹⁵ that BOEM makes in modeling lifecycle greenhouse gas emissions based on its MarketSim results are obviously problematic or could be straightforwardly refined with further study:

- Number 1 assumes near constant demand for oil and gas for up to 70 years into the future, based on EIA’s reference case. However, not only has the EIA recently projected “decreasing domestic demand” for petroleum products through 2034,⁹⁶ but EIA’s reference case estimates are intended to reflect trends and are not necessarily firm predictions about the future. As such, these trends should not be used in isolation as point estimates; instead, agencies should conduct sensitivity analysis over reasonable assumptions and scenarios.
- Number 2 assumes engines used to produce and consume oil and gas will not become more efficient, and oil and gas will remain primary energy sources. The first half of the assumption ignores standard best practices for cost-benefit analysis that instruct agencies to make reasonable assumptions about technological growth.⁹⁷ The second half of that assumption again ignores recent EIA outlooks for declining demand for oil.
- Numbers 5, 7, and 9 assume that production gains are equal across all petroleum products; that offshore oil will be refined into petroleum products in the same proportions as nationally; and that the percent of oil that remains uncombusted will remain the same. These are empirical questions that can be studied and answered for Alaskan onshore production.
- Numbers 6 and 10 relate to foreign versus domestic consumption, and the problems with these assumption have been addressed above.

Many of MarketSim’s elasticities are also out of date, not grounded in the literature, or based on inconsistent sources. The model assumes equality between onshore and offshore supply elasticities for the lower 48 states and Alaska, and uses two-decade-old supply elasticities for the lower 48 states. Some elasticities are derived from different versions of NEMS, which may make them inconsistent. All elasticities should be derived from the same version of NEMS and should be consistent with the calibrations run for quantity and prices in each year.

For several parameters, MarketSim relies on the opinion from a single expert: Dr. Stephen Brown. While use of expert elicitation is acceptable when estimates are unavailable in the literature, it is not clear that the agencies have fully explored all the most current literature to check the accuracy of their parameters. Neither BOEM nor BLM cites any more recent literature on oil and gas elasticities, attempts to distinguish any such literature, or explains why it could not find any newer literature—even though such

⁹⁵ BOEM, *Lifecycle*, *supra*, at 20.

⁹⁶ EIA, AEO2019 at 66; *see also id.* at 68 (declining demand for gasoline).

⁹⁷ *See* OMB, *Circular A-4*.

literature exists.⁹⁸ Moreover, even in the absence of relevant literature on point, expert elicitations should not rely on a single author. Instead, after a thorough review of the literature, BOEM and BLM should identify multiple experts to survey to develop a range of possible estimates, which can be further characterized by central values and variance.⁹⁹ This would allow BLM to conduct an informed sensitivity analysis over these parameter values.

Indeed, BOEM and BLM should be conducting more sensitivity analyses over all of their key parameters and assumptions, such as assumptions based on the EIA Energy Outlook or the NEMS scenarios. The model should also break down non-U.S. producers in OPEC and non-OPEC nations, and conduct sensitivity analysis on whether OPEC will act competitively or non-competitively in response to changes in U.S. production.

BLM claims to have conducted at least one sensitivity analysis—on whether production data was materially different for a 70-year timeline or a 100-year timeline—but has not disclosed this analysis to the public. Even though BLM reports that the sensitivity analysis revealed no difference, these runs have not been made available for the public to review the work. Given NEPA’s public information requirement, BLM should be conducting more sensitivity analyses and then disclosing all relevant data, models, and runs, so the public can review these analyses.

C. BLM Inconsistently Does Not Apply Substitution Analysis to Its Economic Benefits, Thus Inflating its Benefits Calculation Compared to Its Cost Estimates

The DEIS also takes an arbitrarily inconsistent approach by monetizing economic benefits like royalties without applying an energy substitution analysis, while using substitution analysis to make downstream climate effects appear small. The DEIS reports that it has used BOEM’s MarketSim analysis to conclude that if, under the no action alternative, leasing and oil supply from the Coastal Plains is reduced, substitute energy sources like increased oil imports will fill in most of the shortfall, with U.S. oil demand only decreasing by about 3.9%.¹⁰⁰ The DEIS’s estimate of the reduction in downstream greenhouse gas emissions under the no action alternative greatly depends on that substitution analysis; had BLM instead assumed that every barrel of oil not leased under the no action alternative would result in a barrel of oil not consumed, the estimate for the reduction in downstream emission would be substantially higher.

Putting aside the above critiques of the methodology for substitution analysis, it appears that BLM did not apply a comparable substitution analysis to its monetization of

⁹⁸ See, e.g., Taran Faehn et al., *Climate Policies in a Fossil Fuel Producing Country: Demand versus Supply Side Policies* at app. C (Statistics Norway Research Dept. Paper No. 747, June 2013) (discussing alternative supply elasticity assumptions), available at <https://brage.bibsys.no/xmlui/bitstream/handle/11250/2479117/DP%2BF%25C3%25A6hn%2BHagem%2BLindholt%2BM%25C3%25A6land%2BRosendahl.pdf?sequence=2>.

⁹⁹ For example, EPA surveyed twelve experts in an expert elicitation on the mortality impacts of a decrease in PM_{2.5} in the United States. It utilized its responses to specify a concentration-response function, and explore uncertainty. Henry A. Roman, Katherine D. Walker, Tyra L. Walsh, Lisa Conner, Harvey M. Richmond, Bryan J. Hubbell, & Patrick L. Kinney, *Expert Judgment Assessment of the Mortality Impact of Changes in Ambient Fine Particulate Matter in the US*, 42 ENV'T SCI & TECH 2268 (2008).

¹⁰⁰ DEIS at 3-7.

economic benefits. The DEIS provides only a vague description of how it calculated royalty revenue, and the document it relies on, Northern Economics Inc. 2018,¹⁰¹ has not been made available to the public. The DEIS suggest that royalties were calculated based on production volumes,¹⁰² and given royalty rates and the DEIS's assumptions about the price of oil, the estimated \$43 billion in royalties likely derives from an estimated production of 3.4 billion barrels,¹⁰³ which corresponds to the EIA estimate for the total barrels for Arctic Refuge production.¹⁰⁴ Consequently, it would seem that for the purposes of calculating royalties, BLM is using the region's total production figures, is not applying substitution analysis, and is not assuming that increased production from the Coastal Plains at least partly if not largely offsets other sources of energy. Yet according to the substitution analysis that BLM applies to estimate downstream emissions, every barrel leased from the Coastal Plains will come partly at the expense of, for example, production of oil and gas on other federally leased lands. Production from such other substitute sources would have also generated royalty and tax revenues. But while BLM uses assumption about substitute energy sources to offset its estimates of downstream emissions, the agency does not offset its estimate of government revenue expected from this leasing action by the revenue that substitute energy sources would have provided. The result is an inconsistent methodological approach to the leasing action's alleged monetized economic benefits versus the action's unmonetized climate costs, which may have the effect of overestimating benefits while underestimating costs.

V. The DEIS's assessment of economic benefits is unrealistic, as the Coastal Plain is projected to have little oil and gas and deliver far less revenue than Congressional Budget Office estimates suggest

The Coastal Plain is projected to have relatively little oil and gas and deliver far less revenue than some government estimates predict. The EIS must base any resource and revenue projections on the best information available.

Proponents of drilling in the Arctic Refuge argue that it is necessary to reduce imported oil, especially from the Middle East. However, since 2005 U.S. net petroleum imports have declined from 12.5 million barrels of oil per day (bpd) to approximately 5 million bpd.¹⁰⁵ This marked decline is a result of increases in energy conservation and fuel

¹⁰¹ DEIS at 2-236.

¹⁰² DEIS at 3-233

¹⁰³ The DEIS calculates \$43 billion total royalties, \$21.5B in federal royalties plus \$21.5B in state royalties, from drilling through 2050. *Id.* at 3-236. At a 16.67% royalty rate, total wellhead value would be \$258 billion. If oil is selling at about \$75 per barrel over the period (West Coast crude was \$75 as of August 2018, *id.* at 3-37), that means the agency is projecting that 3.4 billion barrels will be produced, and using that figure to calculate royalties.

¹⁰⁴ DEIS at 3-38.

¹⁰⁵ Doug Inkley & Adam Kolton, NAT'L WILDLIFE FED'N & NAT'L WILDLIFE REFUGE ASS'N, ARCTIC NATIONAL WILDLIFE REFUGE, AN AMERICAN CROWN JEWEL IN NEED OF PERMANENT PROTECTION 16 (2015),

https://www.refugeassociation.org/wpcontent/uploads/2015/11/NWF_Arctic_Refuge_Report_web.pdf.

(citing RICHARD A FINEBERG, THE REDUCED OIL IMPORTS REPORT: RECENT CONSERVATION GAINS OUTPERFORM ARCTIC REFUGE REGION OIL POTENTIAL BETWEEN 2012 AND 2030 BY A TWENTY-FIVE TO ONE (25:1) RATIO (2011), www.finebergresearch.com/reports.html).

economy, as well as a significant increase in domestic oil production in established fields in the continental United States in states including Texas, Oklahoma, South Dakota, and North Dakota.¹⁰⁶

As noted by the Republican Congressmen who opposed inserting the Coastal Plain rider into the 2017 Tax Bill, “[t]he resources beneath the Refuge’s Coastal Plain simply aren’t necessary for our nation’s energy independence. If proven, the estimated reserves in the region would represent a small percentage of the amount of oil produced worldwide.”¹⁰⁷ Independent analysis on the Refuge’s oil and gas potential concluded that, “the argument that Arctic Refuge oil would displace oil imports is not well substantiated,” and further that, “unconventional oil production and advances in energy efficiency are the big reasons for reductions in U.S. oil imports in the past decade.”¹⁰⁸

In fact, pursuing stronger energy conservation policies could save far more energy than the Coastal Plain could potentially produce. A 2011 analysis projected reduction in oil imports due to energy conservation from 2012 through 2030 to be about 47 billion barrels of oil.¹⁰⁹ The energy saved would be nearly *five times greater* than the total estimated potential of 10.4 billion barrels of oil in the Coastal Plain.¹¹⁰ Other estimates are even lower: one economic study from 2007 stated that the “best estimate of economically recoverable oil in the federal portion of ANWR is 7.06 billion barrels of oil, a quantity roughly equal to US consumption in 2005.”¹¹¹ In 2015, the U.S. Fish and Wildlife Service stated that “[b]ased on the mean estimate of 7.7 billion barrels of technically recoverable oil in the federally-administered 1002 Area [Coastal Plain],” there are “approximately 5.6 to 7.1 billion barrels of economically recoverable oil.”¹¹²

The Trump Administration claims that the proposed lease sales would generate about \$1 billion in net federal revenues.¹¹³ But numerous questions have been raised as to whether Coastal Plain leases can deliver anything close to these predictions. More recent predictions expect revenues to be closer to \$37.5 or 50 million—a mere fraction of the amount touted by drilling proponents.¹¹⁴

¹⁰⁶ A. Perry and C. Alkire, Arctic National Wildlife Refuge: Economics of Oil Development, KEY-LOG ECONOMICS for The Wilderness Society, Nov 2017, at 29.

¹⁰⁷ Letter, *supra* note 7.

¹⁰⁸ Perry & Alkire, KEY-LOG ECONOMICS, *supra* note 106 at 4.

¹⁰⁹ INKLEY & KOLTON, *supra* note , at 16.

¹¹⁰ *Id.*

¹¹¹ Matthew J. Kotchen & Nicholas E. Burger, *Should We Drill in the Arctic National Wildlife Refuge? An Economic Perspective*, 35 ENERGY POL’Y 4720, 4720 (2007), <https://environment.yale.edu/kotchen/pubs/anwr.pdf>.

¹¹² U.S. FISH AND WILDLIFE SERV., ARCTIC NWR COMPREHENSIVE CONSERVATION PLAN, ch. 4: Affected Environment, *supra* note 3, at 4-36.

¹¹³ CONGRESSIONAL BUDGET OFFICE, Cost Estimate: A Legislative Proposal Related to the Arctic National Wildlife Refuge (Nov. 8, 2017), <https://www.cbo.gov/system/files/115th-congress-2017-2018/costestimate/anwrreconciliation.pdf>.

¹¹⁴ Perry & Alkire, KEY-LOG ECONOMICS, *supra* note **Error! Bookmark not defined.** at 29; *Arctic Refuge Leasing Revenues Don’t Add Up*, TAXPAYERS FOR COMMON SENSE (Nov. 10, 2017), <https://www.taxpayer.net/energy-natural-resources/arctic-refuge-leasing-revenues-dont-add/>.

Even if 800,000 acres of the Coastal Plain were leased (an unlikely and undesirable scenario), BLM would have to receive bonus bids of more than \$2,700 per acre, on average, for the Congressional Budget Office's projection of \$2.2 billion in total bonus bid revenue (with 50 percent of that total allocated to Alaska) to be realized.¹¹⁵ Recent lease sales in Alaska's North Slope suggest that these estimates are highly improbable for at least two reasons: (1) even if all or significant amounts of acreage in the area were offered for lease, oil and gas companies would bid on only a fraction; and, (2) an average of \$2,700 per acre in bonus bids far surpasses anything seen in recent lease auctions in Alaska.

Last year's lease sale of more than 10 million acres in the National Petroleum Reserve in Alaska brought in bids on *less than one percent* of the acres offered and generated just over \$1 million in bid revenue.¹¹⁶ In addition to low potential interest, bid prices are likely to be far lower than the Trump administration's generous projections. For parcels offered in four sales from 2013 to 2016 in the National Petroleum Reserve in Alaska, BLM received just \$24.25 per acre in bonus bids. In a 2016 sale for tracts in the wider North Slope area, the state of Alaska generated an average of \$28.17 per acre in bonus bids.¹¹⁷ Nothing from these historical sales suggests the federal government could receive bonus bids of \$2,700 per acre.¹¹⁸ To the extent that the EIS discusses the potential revenue from any lease sales, it must use accurate projections based on similar recent sales. Both resource quantity and price estimates must be based on realistic assumptions.

Moreover, the greater costs associated with harsh weather and lack of infrastructure in the Arctic Refuge mean that oil and gas development would be far more expensive in this area than drilling in the lower 48 states—31 times greater by one estimate from the American Petroleum Institute—all of which will contribute to lower bonus bids.¹¹⁹ Other estimates state that drilling in the Arctic may be up to 10 times more expensive than drilling in the lower 48 states.¹²⁰ It would cost more to transport any oil or gas developed in the Coastal Plain to market, given the lack of infrastructure and long distance, increasing costs for producers. Developers would also be competing with oil and gas development in other Alaskan regions, including the National Petroleum Reserve,

¹¹⁵ See *Arctic Refuge Leasing Revenues Don't Add Up*, *supra* note 114; CONGRESSIONAL BUDGET OFFICE, Cost Estimate, *supra* note 113 at 3. The Congressional Budget Office also projects that the federal government would collect net receipts from rental payments totaling about \$2 million over the 2022-2027 period. (Lease holders make an annual rental payment until production begins.)

¹¹⁶ Sally Jewell, *Sally Jewell: Let the Trump Administration Know Arctic Refuge is No Place for Oil and Gas Drilling*, SEATTLE TIMES (June 1, 2018), <https://www.seattletimes.com/opinion/sally-jewell-let-the-trump-administration-know-arctic-refuge-is-no-place-for-oil-and-gas-drilling/>.

¹¹⁷ See <http://dog.dnr.alaska.gov/Documents/Leasing/SaleResults/NorthSlope/2016W/NS2016W-SaleResultsSummary.pdf/>.

¹¹⁸ See *Arctic Refuge Leasing Revenues Don't Add Up*, *supra* note 114. The Congressional Budget Office also estimated that the federal government would receive royalty payments on oil produced from ANWR leases; however, it found that based on the typical amount of time necessary to drill exploratory wells, complete production plans, and build the necessary infrastructure to produce and transport any oil produced in ANWR, it expects that "no significant royalty payments would be made until after 2027. CONGRESSIONAL BUDGET OFFICE, Cost Estimate, *supra* note 113 at 3.

¹¹⁹ Corn et al., CONGRESSIONAL RESEARCH SERVICE, *supra* note 9 at 15.

¹²⁰ Perry and Alkire, KEY-LOG ECONOMICS, *supra* note 106 at 33.

which already have existing drilling infrastructure, lowering expected bids relative to these other regions.

In short, low resource potential, high development costs, and low expected federal revenue counsel strongly against leasing in the Coastal Plain, especially where the environmental costs and uncertainties are so high. If BLM nonetheless proceeds with holding lease sales pursuant to the 2017 Tax Act, it must at least consider delayed leasing alternatives in light of economic, environmental, and social uncertainties (explained in Part V), and the DEIS must reflect more realistic predictions about government revenue.

VI. BLM fails to quantify any ecosystem service values, non-use values, or passive use values.

The DEIS admits that “[t]he nonuse and passive use values of the Coastal Plain and its other ecosystem service values (although not quantified in this analysis) would be diminished from their current value by oil and gas leasing development.”¹²¹ The implication is that the Coastal Plain’s ecosystem service values, non-use values, and passive use values cannot be quantified. However, BLM has failed to explain why these myriad and potentially quite significant values could not be quantified, and has ignored important literature that does quantify and monetize at least some of the relevant values, which could have allowed BLM to provide some lower-bound estimates. As explained more thoroughly in our separate comments on the failure to use the social cost of greenhouse gases to monetize the proposed action’s climate damages,¹²² failure to quantify an otherwise quantifiable environmental cost effectively treats that environmental cost as worthless, and is arbitrary when the agency chooses, as BLM does here,¹²³ to monetize the action’s alleged economic benefits.

There is a substantial amount of literature on valuing ecosystem services in general,¹²⁴ and a number of papers on valuing ecosystems services in Alaska and ANWR specifically. In general, while standard techniques and studies on economic valuation may not always capture “all sources or types of value (e.g., intrinsic values on which the notion of rights is founded),” long-established and accepted techniques do exist to capture economic value both “from the use of an environmental resource (use values), including both commercial and noncommercial uses, or from its existence even in the absence of use (nonuse value).”¹²⁵ According to the National Research Council, “if policymakers consider trade-offs and benefits and costs when making policy decisions, then quantification of the value of

¹²¹ DEIS at 3-239.

¹²² See Joint Comments from Policy Integrity et al., on Failure to Use the Social Cost of Greenhouse Gases.

¹²³ DEIS at 3-235 to 3-236.

¹²⁴ See e.g., National Research Council 2005. *Valuing Ecosystem Services: Toward Better Environmental Decision-Making*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/11139>.; Costanza, R., R. d’Arge, R. deGroot, et al. 1997. The value of the world’s ecosystem services and natural capital. *Nature* 387: 253–260.; Bishop, R.C., and M. P. Welsh. 1992. Existence values in benefit-cost analysis and damage assessment. *Land Economics* 68(4):405-417.; Freeman, A.M., III. 1993a. *The Measurement of Environmental and Resource Values: Theory and Methods*. Washington, D.C.:Resources for the Future.

¹²⁵ NRC at 5.

ecosystem services is essential. Failure to include some measure of the value of ecosystem services in benefit-cost calculations will implicitly assign them a value of zero.”¹²⁶

The National Research Council lists myriad ecosystem service values that may be significant in ANWR, may be threatened by the proposed action, and may be quantifiable given existing literature. Among the potentially relevant ecosystem service values that the National Research Council lists for aquatic and related terrestrial ecosystems are:¹²⁷

- Direct ecosystem service values: fishing, wild resources, potable water and other water resources, recreation, genetic material and the maintenance of biodiversity, and scientific and educational opportunities
- Indirect ecosystem service values: nutrient retention and cycling, purification of air and water, flood control, storm protection, habitat function, shoreline and river bank stabilization
- Nonuse ecosystem service values: cultural heritage, resources for future generations, existence of species, existence of wild places

Many of these key values can be quantified and monetized. For example, BLM could try to monetize the contribution of an undisturbed ANWR to Alaska’s recreation economy. A 2018 National Park Service report states that 2.786 million visitors to national parks in Alaska spent nearly \$1.3 billion in the state in 2017. That spending resulted in 18,903 jobs and had a cumulative benefit to the state economy of \$1.89 billion.¹²⁸ Yet the DEIS’s section on recreation¹²⁹ contains almost no quantification and no monetization of impacts. This is true of the DEIS’s treatment of many other potentially quantifiable and monetizable ecosystem service values.

There are also existing estimates for the values of the ecosystem services of different biomes. For example, Costanza et al. estimate that forests contribute \$1,641 per hectare per year (\$969 in 1994\$) for the numerous ecosystem service values they provide. These services include: recreation (direct), raw material (direct), climate regulation (indirect), nutrient recycling (indirect), and erosion control (indirect).¹³⁰ BLM could have pulled similar figures from existing literature to calculate a rough estimate of the use values of the Coastal Plain.

Even if it is difficult to quantify some other individual ecosystem services in ANWR, there is peer-reviewed literature on people’s willingness to accept drilling in the refuge. Overall, while there are some economic benefits to drilling in the Coastal Plain, the average U.S. household places a significant value on leaving ANWR untouched by fossil fuel development. Kotchen and Burger find that “average breakeven willingness to accept compensation to allow drilling in ANWR ranges from \$582 to \$1782 per person, with a mean estimate of \$1141.”¹³¹ It is important to note that the authors calculate the breakeven

¹²⁶ Id at 5.

¹²⁷ NRC at 46, 80.

¹²⁸ NATIONAL PARK SERVICE (2018), <https://www.nps.gov/subjects/socialscience/vse.htm>.

¹²⁹ DEIS at 3-202 to 3-209.

¹³⁰ Costanza et al. at 256.

¹³¹ M. J. Kotchen and N. E. Burger. Should we drill in the Arctic National Wildlife Refuge? An economic perspective. *Energy Policy* 35 4720-4729. May 2007.

value against estimated net benefits of \$251 billion, which does not take into account the costs of greenhouse gas emissions. Applying the social cost of carbon, the Coastal Plain leasing plan would cost at the very least, an additional \$250 million per year using BLM's own estimates of downstream emissions¹³²—and given the errors in BLM's substitution analysis (see *supra*), the costs of downstream emissions could easily reach billions per year.

ANWR has a special level of nonuse value in the minds of Americans. A 1992 study on the Exxon Valdez oil spill “revealed that many Americans who have not visited Alaska and never intend to do so nevertheless place high values on maintaining the pristine and unique but fragile coastal and aquatic ecosystems of Alaska.”¹³³ This study found that the total value to the U.S. population to prevent a spill like Exxon Valdez was around \$5.38 billion.¹³⁴ In connection to the Exxon Valdez spill, “the District of Columbia Circuit of the U.S. Court of Appeals held that nonuse value should be part of the economic damages due to releases of oil or hazardous substances that injure natural resources.”¹³⁵ While this case is specific to an oil spill, it is reasonable that a court would find that nonuse value should also be taken into consideration as economic damages to natural resources by other means.

A more recent study found that the total value to the U.S. population to prevent a spill like Exxon Valdez was around \$10.87 billion.¹³⁶ Another study on ANWR specifically, by the University of Alaska Anchorage, finds that “U.S. households receive up to \$30 billion worth of economic value per year from the continued preservation of Alaska's federal conservation units in their undeveloped state.”¹³⁷ So even though millions of Americans will never visit the refuge, BLM has ample evidence to assume that they value keeping it in its pristine state.

BLM cannot ignore this important literature on the quantification and monetization of existence value and other significant ecosystem service benefits. The National Research Council provides a useful set of guidelines for valuation of ecosystem services, should BLM need such direction.¹³⁸ As explained in our separate comments on the failure to use the

¹³² See Joint Comments from Policy Integrity et al., on Failure to Use the Social Cost of Greenhouse Gases, *supra*.

¹³³ NRC at 47.

¹³⁴ Carson, R.T., et al. 1992. A Contingent Valuation Study of Lost Passive Use Values Resulting From the Exxon Valdez Oil Spill. Report to the Attorney General of the State of Alaska. Available at: https://mpr.ub.uni-muenchen.de/6984/1/MPRA_paper_6984.pdf; Carson, R.T., et al., 2003. Contingent valuation and lost passive use: damages from the Exxon Valdez oil spill. *Environmental and Resource Economics* 25, 257–286.

¹³⁵ Liu, S. et al., Valuing ecosystem services: Theory, practice, and the need for a transdisciplinary synthesis. *Ann. N.Y. Acad. Sci.* 1185 (2010) 54–78, at 61.

¹³⁶ Carson, R.T., et al., 2003. Contingent valuation and lost passive use: damages from the Exxon Valdez oil spill. *Environmental and Resource Economics* 25, 257–286.

¹³⁷ S. Colt. The Economic Importance of Healthy Alaska Ecosystems. Institute of Social and Economic Research, University of Alaska Anchorage. Prepared for Alaska Conservation Foundation. Jan. 2001. At 7.

¹³⁸ NRC at 253.

social cost of greenhouse gases,¹³⁹ failure to quantify an otherwise quantifiable environmental cost is arbitrary when the agency selectively monetizes the action's alleged economic benefits but not the costs.

Sincerely,
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Attached: Michael Livermore, *Patience is an Economic Virtue*, 84 U. Colo. L. Rev. 581 (2013), also available through Policy Integrity's website at https://policyintegrity.org/files/publications/Patience_is_an_Economic_Virtue.pdf.

¹³⁹ See Joint Comments from Policy Integrity et al., on Failure to Use the Social Cost of Greenhouse Gases, *supra*.