December 18, 2020

ATTORNEY GENERAL RAOUL OPPOSES FEDERAL EFFORT TO SELL OIL AND GAS LEASES IN THE ARCTIC NATIONAL WILDLIFE REFUGE

Chicago — Attorney General Kwame Raoul today joined a coalition of 13 attorneys general in submitting comments with the Bureau of Land Management (BLM) opposing the federal government's plan to sell oil and gas leases in the Coastal Plain of the Arctic National Wildlife Refuge, rushing the process with unprecedented haste before the scheduled public comment period has closed.

In the comments, Raoul and the coalition explain that on Nov. 17, the BLM issued a 30-day call for nominations and comment seeking public input on what tracts of land should be offered for sale and lease conditions. But on Dec. 7, the BLM issued a notice that it would hold a sale on Jan. 6, 2021, specifying areas to be offered, lease terms, conditions, and special stipulations, cutting short the deadline to accept all nominations and comments. Raoul and the coalition argue that noticing a lease sale well before the close of the 30-day comment deadline denies members of the public and industry the chance to have their voices heard.

"This leasing program ignores the harmful impacts of climate change and could result in irreparable damage to our nation's ecosystem and wildlife for years to come," Raoul said. "Expediting this process before the public comment period has closed ignores these facts and denies the public opportunity to express their concerns. I will continue to defend against unlawful policies and programs like this that put our environment at risk."

The Arctic Refuge, often referred to as "America's Serengeti," is home to a diverse array of wildlife that relies on its fragile ecosystem. The Refuge's 1.56 million acre Coastal Plain is considered to be a national treasure, unparalleled in its biological significance for hundreds of species, including caribou, polar bears, grizzly bears, wolves and migratory birds. This fragile Arctic and Coastal Plain ecosystem is particularly vulnerable to environmental stressors, including climate change, which has caused thinning sea ice and thawing of permafrost in the region.

Congress successfully protected the region from oil and gas exploration, drilling and production for more than 40 years, until a provision in the 2017 Tax Cuts and Jobs Act opened the door for oil and gas lease sales. The federal government's current plans have for the first time exposed the entire, unspoiled Coastal Plain to leasing, exploration, and development, which is not needed to meet the country's demand for oil and natural gas or for U.S. energy independence.

In today's comments, Raoul and the coalition argue that the federal government cannot lawfully offer any tracts for lease at this time because the Coastal Plain Oil and Gas Lease Program violates multiple federal laws and relies on a wholly deficient and unlawful environmental review. The comments call for the lease sale on Jan. 6, 2021 to be canceled because the BLM unlawfully:

- Failed to fully assess the Coastal Plain lease program's significant environmental harms.
- Adopted a deficient and unlawful climate analysis of harms due to increased greenhouse gas emissions from the lease program.
- Failed to adequately study the lease program's impacts on migratory birds.
- Unlawfully prioritized oil and gas development over the Arctic Refuge's conservation purposes.

Raoul and the coalition also argue that any leases executed now from awarded bids will fall far short of ever generating revenue sufficient to satisfy the Tax Act and the $1.1 billion in federal tax revenue Congress intended, because Arctic Refuge oil reserves currently are uneconomic to develop and likely will remain so.

Joining Raoul in the comments are the attorneys general of Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, New Jersey, New York, Oregon, Rhode Island, Vermont and Washington.

ATTORNEYS GENERAL OF THE STATES OF WASHINGTON, CONNECTICUT, DELAWARE, ILLINOIS, MAINE, MARYLAND, MINNESOTA, NEW JERSEY, NEW YORK, OREGON, RHODE ISLAND, VERMONT, AND THE COMMONWEALTH OF MASSACHUSETTS.

December 17, 2020

By E-Mail and U.S. Mail

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Re: Call for Nominations and Comments for the Coastal Plain Alaska Oil and Gas Lease Sale, 85 Fed. Reg. 73292 (Nov. 17, 2020), and Notice of 2021 Coastal Plain Alaska Oil and Gas Lease Sale, 85 Fed. Reg. 78865 (Dec. 7, 2020).
Comments Submitted by State Attorneys General

Dear State Director Padgett:

The undersigned attorneys general submit these comments on the Bureau of Land Management's (BLM or the Agency) November 17, 2020, 30-day call for nominations and comments, 85 Fed. Reg. 73292 (Call for Nominations), and December 7, 2020, notice of a January 6, 2021 lease sale, 85 Fed. Reg. 78865 (Lease Sale Notice), for Coastal Plain Alaska Oil and Gas Lease Program.

BLM must withdraw the December 7, 2020 Lease Sale Notice, cancel the January 6, 2021 sale, and not issue a new notice of lease sale until after the lease tract nomination and public comment period closes at the end of the 30-day comment period—and then only after BLM has thoroughly reviewed and considered all nominations, information, and comments received through the December 17 deadline. Not only does BLM issuance of the Lease Sale Notice before the end of nomination and comment period abandon its established practice and disregard the regulatory process it purports to follow, it contravenes the important and fundamental role that the nomination and public comment period plays in informing the Coastal Plain lease sale. By noticing a lease sale with detailed statement well before the close of the 30-day comment period, BLM effectively denied consideration of comments submitted after December 7 related to lease sale tract selection, lease terms, and stipulations.[1] In a reckless rush

[1] In its December 7, 2020, detailed statement accompanying the Lease Sale Notice, BLM asserts that—despite already deciding on lease tracts, terms, and stipulations 10 days before the end of the nomination and comment period—it *may* amend its lease tract offering upon review of comments received after December 7 but by December

to hold a lease sale before the inauguration, BLM has cut corners and foreclosed meaningful public input, making the public comment and nomination process a sham.

More fundamentally, BLM cannot lawfully offer for lease any tracts in the Coastal Plain of the Arctic National Wildlife Refuge (Arctic Refuge) because it would be relying on a wholly deficient and unlawful environmental review and Record of Decision. BLM issued the lease sale notice pursuant to and relying on its Final Environmental Impact Statement (FEIS) for the Coastal Plain Oil and Gas Leasing Program, 84 Fed. Reg. 50,472 (Sept. 25, 2019), and its Record of Decision approving the Coastal Plain Leasing Program. On September 9, 2020, the undersigned state attorneys general (States) filed a complaint in the U.S. District Court for the District of Alaska seeking a declaration that BLM's FEIS and Record of Decision violate the National Environmental Policy Act (NEPA), the National Wildlife Refuge System Administration Act (Refuge Act), the Administrative Procedure Act (APA), the Alaska National Interest Lands Conservation Act (ANILCA), and the Tax Cuts and Jobs Act of 2017 (Tax Act). The States' Complaint in *Washington et al. v. Bernhardt*, Case No 3:20-cv-00224-SLG, attached hereto as **Addendum A**, seeks to vacate and set aside the FEIS and Record of Decision, and any lease sale or other action taken in reliance on either document.

The Arctic Refuge is often referred to as "America's Serengeti," and the Coastal Plain is the most biologically productive part of the Arctic Refuge for wildlife and the center of wildlife activity.[2] The Coastal Plain is a 1.56 million-acre national treasure, unparalleled in its biological significance with a vast array of wildlife, and a sacred area important to the subsistence of the Gwich'in people. Species that are particularly reliant on the Coastal Plain's unique ecosystem include caribou, polar bears, and millions of birds that migrate to and from six continents and through all 48 lower states. This fragile Arctic and Coastal Plain ecosystem is particularly vulnerable to environmental stressors, including climate change, which has caused thinning sea ice and thawing of permafrost in the region.

The Coastal Plain Leasing Program would for the first time open the unspoiled Coastal Plain to oil and gas leasing, exploration, and development based on a deficient and unlawful environmental review and Record of Decision. None of the lease tracts noticed can be offered for sale because BLM's Record of Decision and FEIS unlawfully:

17, 2020. This disingenuous attempt to justify truncating the nomination period neither excuses cutting off public comment well before the announced deadline nor assures that BLM will have sufficient opportunity or impetus to reevaluate and change its detailed lease offering.

[2] Laura B. Comay et al., Cong. Research Serv., RL33872, Arctic National Wildlife Refuge (ANWR): An Overview (Jan. 9, 2018) at 18 (quoting U.S. Dept. of the Interior, Fish and Wildlife Serv., Geological Survey, and Bureau of Land Mgmt., Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment, Report and Recommendation to the Congress of the United States and Final Legislative Environmental Impact Statement, 1987 [commonly referred to as the 1002 Report]).

- failed to consider a reasonable range of program alternatives including an alternative that serves the conservation purposes of the Arctic Refuge, in violation of NEPA and the APA;
- failed to take a hard look at impacts on greenhouse gas emissions and climate change, in violation of NEPA and the APA;
- failed to take a hard look at impacts on migratory birds, in violation of NEPA and the APA;
- failed to determine that the authorized leasing program is compatible with or fulfills the purposes of the Arctic Refuge and unlawfully prioritized oil and gas development over the Refuge's conservation purposes, in violation of the Refuge Act, ANILCA, and the APA; and
- adopted an unlawful interpretation of the Tax Act that eliminates Congress's restrictions on development in the Arctic Refuge, in violation of that Act and the APA.

Finally**,** BLM should withdraw its notice of lease sale because any leases executed now from awarded bids will fall far short of generating revenue sufficient to satisfy the Tax Act and the $1.1 billion in federal tax revenue Congress intended. Arctic Refuge oil reserves currently are uneconomical to produce and likely will remain so. As discussed below, the breakeven oil price for development in the Coastal Plain is estimated to be between $78 to $90 per barrel. Holding a lease sale when oil prices are projected to remain *well* below that range and are currently hovering between $40 and $43 per barrel could completely undermine the Leasing Program's revenue generation potential by suppressing bidding participation and lease sale price.

I. BLM'S Lease Sale Notice Issued Prior to the End of the Nomination and Comment Period Contradicts the Regulatory Process BLM Purports to Follow, Disregards Industry and Public Input, and Must Be Withdrawn.

The Tax Cuts and Jobs Act of 2017 (Tax Act)[3] directed BLM to establish and administer a competitive oil and gas leasing program in the Arctic National Wildlife Refuge Coastal Plain "in a manner similar to the administration of lease sales" under the Naval Petroleum Reserves Production Act of 1976, 42 U.S.C. §§ 6501 et seq., and regulations for competitive oil and gas leasing in the National Petroleum Reserve in Alaska (NPR-A) at 43 C.F.R. § 3130. The NPR-A lease sale regulations, which BLM purports to follow in the call for nominations and notice of lease sale,[4] require that BLM "shall invite and consider suggestions and relevant information for such program from the Governor of Alaska, local governments, Native corporations, industry, other Federal agencies, including the Attorney General and all interested parties, including the general public" through a "request for information [which] shall be issued as a notice in the

[3] Section 20001 of Public Law (PL) 115-97.

[4] *See* Call for Nominations, 85 Fed. Reg. 73292 (Nov. 17, 2020) ("Pursuant to 43 CFR 3131.2, the BLM is issuing this call for nominations and comments on tracts within the Coastal Plain (CP) of the Arctic National Wildlife Refuge that may be offered for lease in the upcoming CP Oil and Gas Lease Sale").

Federal Register." 43 C.F.R. § 3131.1. Following the call for nominations and comments, BLM may issue a notice of lease sale "at least 30 days prior to the date of the sale." 43 C.F.R. § 3131.4-1.

On November 17, 2020, BLM published a 30-day Call for Nominations and comments, soliciting information and comments on tracts in the Coastal Plain "that may be offered for lease," with nominations and comments due by December 17, 2020. 85 Fed. Reg. 73292. But in an unprecedented move, BLM issued a lease sale notice on December 7, 2020, well before the close of the 30-day notice and comment period on the Call for Nominations. 85 Fed. Reg. 78865. The Lease Sale Notice was accompanied by a detailed statement of the sale in the manner specified by 43 C.F.R. § 3131.4-1 (c), including a description of the areas to be offered for lease, the lease terms, conditions and special stipulations.

Not only does BLM's notice of lease sale before the end of nomination and comment period abandon its established practice and contravene the regulatory process directed by Congress, it is inconsistent with BLM State Director Padgett's statements last month about the important and fundamental role the nomination and comment period plays in informing the Coastal Plain lease sale: "Receiving input from the industry on which tracts to make available for leasing is vital in conducting a successful lease sale."[5] It also disregards and contradicts representations made in the U.S. District Court for the District of Alaska regarding the lease sale process. In a November 16, 2020, filing in the States' challenge to the Coastal Plain leasing program, the Department of Justice informed the court that "BLM will receive nominations and comments for a 30-day period. *Subsequently*, should BLM determine to issue a notice of sale, it will publish such notice in the Federal Register prior to the date of any such sale."[6]

By noticing a lease sale with detailed statement well before the close of the 30-day comment period, BLM denied members of the public and industry from having their nominations, information, and comments submitted after December 7 from being considered and informing the lease sale tract selection, lease terms, and stipulations. In a reckless rush to hold a lease sale before President Trump leaves office, BLM has foreclosed meaningful public input, making the public comment and nomination period a charade. BLM must withdraw the notice of a January lease sale and not issue a new notice until it has received, thoroughly reviewed, and actually considered all received nominations, information, and comments.

More fundamentally, BLM cannot lawfully hold a lease sale at this time because, as discussed below and alleged in the States' Complaint attached as Addendum A, BLM's Lease

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[5] Press releases, U.S. Department of the Interior, Bureau of Land Management, Coastal Plain Oil and Gas Lease Sale Nominations Sought Across All 1.6M Acres by Dec. 17 (Nov. 16, 2020), https://www.blm.gov/press-release/coastal-plain-oil-and-gas-lease-sale-nominations-sought-across-all-16m-acres-dec-17.

[6] *Washington et al. v. Bernhardt*, Case No 3:20-cv-00224-SLG, Defendants' Notice of Filing (Nov. 16, 2020) (emphasis added).

Sale Notice and Coastal Plain Lease Program rely upon a FEIS and authorizing Record of Decision that violate NEPA, the Refuge Act, the APA, ANILCA, and the Tax Act.

II. None of the Lease Tracts Can Lawfully be Offered for Sale at This Time Because the FEIS and Record of Decision Violate NEPA and the APA.

Before conducting any oil and gas leasing in the Coastal Plain region, NEPA mandates that the BLM must assess—"to the fullest extent possible"—the environmental impacts of the Leasing Program.[7] BLM must also fully apprise the public of the environmental impacts associated with this proposed major federal action.[8] At the time of NEPA's passage, Congress expressly provided that the purpose of the statute was to "promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation …."[9]

The Record of Decision relies upon and adopts the deficient FEIS, which, among other things, fails to consider an adequate range of alternatives, fails to assess adequately the greenhouse gas emissions and climate impacts of the Leasing Program, and fails to assess adequately migratory bird impacts of the program. Each action alternative considered in the FEIS threatens significant and long-lasting harm to the unique ecology, wildlife, wilderness, and recreational values of the Arctic Refuge, including to the migratory bird populations of great importance to the undersigned States and to the Refuge itself. In addition, each action alternative threatens to significantly contribute to greenhouse gas emissions and to forever alter the hydrology and habitat of the Coastal Plain.

A. The Record of Decision adopts a deficient and unlawful FEIS alternatives analysis.

The alternatives section "is the heart of the environmental impact statement."[10] Agencies must rigorously explore and objectively evaluate all reasonable program alternatives, including no action, and must discuss the reasons for eliminating any alternatives which were rejected for detailed study.[11] An EIS is evaluated based on its "reasonably identified and defined objectives,"

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[7] 42 U.S.C. § 4332.

[8] 40 C.F.R. § 1500.1; *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1185 (9th Cir. 2008) (The purpose of NEPA is twofold: "ensure[ ] that the agency ... will have available, and will carefully consider, detailed information concerning significant environmental impacts[, and] guarantee [ ] that the relevant information will be made available to the larger [public] audience.") (citations omitted).

[9] 42 U.S.C. § 4321.

[10] 40 C.F.R. § 1502.14.

[11] *Id*., § 1502.14(a) and (d); *see also Border Power Plant Working Grp. v. Dep't of Energy*, 260 F. Supp. 2d 997, 1030 (S.D. Cal. 2003) (*quoting Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1520 (9th Cir. 1992) (an

and "an alternative is properly excluded from consideration in an environmental impact statement *only* if it would be reasonable for the agency to conclude that the alternative does not bring about the ends of the federal action."[12] To be effective, the alternatives analysis "should present the environmental impacts of the proposal and the alternatives in comparative form" to "sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public."[13] Despite purporting to balance development with surface resource protection, the FEIS adopted an alternative that makes the most acreage available for construction of oil and gas infrastructure and includes the fewest environmental protections.

The FEIS failed to consider a reasonable range of alternatives. It analyzed three action alternatives in addition to a no-action Alternative A. Alternatives B and C would authorize leases in the entire program area, covering 1,563,500 acres. Alternative D contains two sub-alternatives, D-1 and D-2. Alternative D-1 would authorize lease sales on 1,037,200 acres and Alternative D-2 would authorize lease sales on 800,000 acres.

The FEIS purported to analyze various terms and conditions and stipulations to be applied to leases and associated oil and gas activities, to properly balance oil and gas development with protection of surface resources. But instead, each action alternative prioritizes oil and gas production above the conservation purposes of the Refuge. Among other things, all of the action alternatives considered would allow 174 or more miles of gravel road construction *plus* extensive and harmful ice road construction, 212 or more miles of pipeline, nearly 300 acres of gravel pits and stockpiles, and seismic activity across much of the Coastal Plain. These action alternatives, especially given BLM's unlawful interpretation of the Tax Act's 2,000-acre surface development limit discussed in Section IV, allow for surface acre development that exceeds the maximum set by the Tax Act.

None of the action alternatives BLM considered in the FEIS would restrict surface acre disturbance, limit ice road construction, delay or phase leasing, limit seismic activity, mitigate greenhouse gas emissions, effectively protect migratory bird habitat, meaningfully minimize or mitigate adverse environmental impacts, or otherwise fulfill the conservation purposes of the Refuge to the extent consistent with the Tax Act, as discussed in section III.

BLM failed to analyze an alternative that includes some or all of these components to better protect the Coastal Plain from significant environmental harm and advance the conservation purposes of the Arctic Refuge. Instead, BLM's Record of Decision authorized Alternative B analyzed in the FEIS, which allows oil and gas leasing on the entire Leasing Program area encompassing 1,563,500 acres–nearly all of the Coastal Plain. It makes the most

"agency must look at every reasonable alternative, with the range dictated by the nature and scope of the proposed action").

[12] *Anglers Conservation Network v. Pritzker*, 139 F. Supp. 3d 102, 118–19 (D.D.C. 2015) (emphasis in original, internal quotations excluded).

[13] *Id.*

acreage available for construction of oil and gas infrastructure and includes the fewest environmental protections. By failing to consider a reasonable alternative to better protect surface resources and adopting the alternative with the most significant environmental impacts on the fragile Coastal Plain ecosystem, BLM's FEIS violated NEPA.

B. The Record of Decision adopts a deficient and unlawful FEIS climate analysis.

1. The climate crisis, greenhouse gas emissions, and oil and gas production.

Oil and gas production from the Coastal Plain lease sales would contribute to greenhouse gas emissions that cause climate change and exacerbate the current climate crisis. The Intergovernmental Panel on Climate Change (IPCC), an international scientific body of the United Nations, has concluded that emissions of carbon dioxide from fossil fuel combustion and industrial processes contributed about 78 percent of the total greenhouse gas emissions increase from 1970 to 2010.[14] The largest source of U.S. anthropogenic greenhouse gas emissions is fossil fuel combustion.[15] In 2016, fossil fuel combustion accounted for 76 percent of U.S. greenhouse gas emissions, and in 2017, nearly half of U.S. energy-related carbon dioxide emissions (by far the dominant contributor to overall greenhouse gas emissions) came from combustion of petroleum products.[16]

In 2018, the IPCC issued a report that concluded, with a high degree of scientific confidence, that if the current pace of emissions continues, warming will reach 1.5 degrees Celsius (2.7 degrees Fahrenheit) above pre-industrial levels between 2030 and 2052.[17] The IPCC stressed that warming above that level brings significantly increased risk for human health, food security, global economies, water supply, national security, sea level rise, biodiversity, species loss and extinction, and ocean health, among others.[18] The IPCC warned that the world must reduce global carbon dioxide emissions dramatically well before 2030 if we are to maintain temperature increase below 1.5 degrees Celsius (2.7 degrees Fahrenheit), and that to have a fifty percent chance of meeting the 1.5 degrees target, the world can emit no more than 580 gigatons of carbon dioxide, significantly reducing the portion of known "burnable" fossil fuel reserves.[19]

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[14] IPCC *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, at 5 (R.K. Pachauri and L.A. Meyer eds. 2014), https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf.

[15] U.S. Energy Information Administration, *Energy and the Environment Explained*: *Where Greenhouse Gases Come From* (last updated: July 20, 2018), https://www.eia.gov/energyexplained/index.php?page=environment_where_ghg_come_from.

[16] *Id*.

[17] IPCC, *Summary for Policy Makers, In: Global Warming of 1.5° C*, § A.1, at 6 (Oct. 2018), *available at*: https://www.ipcc.ch/sr15/chapter/summary-for-policy-makers/. For greater detail, *see also*, *id.*, Ch. 1, at 66, https://www.ipcc.ch/site/assets/uploads/sites/2/2019/02/SR15_Chapter1_Low_Res.pdf.

[18] *Id.*, § B, at 9.

[19] *Id*., § C, at 14.

Multiple studies repeatedly have demonstrated that a substantial portion of the world's recoverable fossil fuel reserves, such as those located in the Coastal Plain, must remain unburned in order to avert the most catastrophic impacts of climate change.[20] Over the past ten years, these unburnable reserve estimates have steadily increased. The 2018 IPPC report warned that to have only a fifty percent chance of avoiding the most devastating consequences of climate change resulting from global warming above the 1.5-degree Celsius level, about eighty percent of recoverable fossil fuel reserves must remain unburned.[21]

The Interior Department and the twelve other federal agencies that comprise the U.S. Global Change Research Program warned in the November 2018, Fourth National Climate Assessment[22] that without substantial and sustained efforts to reduce greenhouse gas emissions, climate change will increasingly disrupt ecosystems; threaten human health, safety, and quality of life; and hinder economic growth throughout the United States. The Assessment concluded that "[p]eople who are already vulnerable, including lower-income and other marginalized communities, have lower capacity to prepare for and cope with extreme weather and climate-related events and are expected to experience greater impacts."[23]

Indeed, our States are already experiencing more frequent and increasingly severe extreme weather events from climate change and sea level rise, including storm surge-related coastal flooding, tidal inundation, inland flooding, drought, wildfires, and other catastrophic natural disasters. These extreme weather events have resulted in significant economic losses to our States, including from damage to state properties, public infrastructure, private homes, businesses, and wildlife habitat, along with increasing demands for emergency services and losses to our recreation and tourism industries.

Our States have expended considerable resources and efforts to significantly reduce greenhouse gas emissions through increased use of renewable energy sources and by promoting electric vehicles. These efforts notwithstanding, our States already are experiencing devastating and increasingly severe climate impacts. Any greenhouse gas emissions from a Coastal Plain

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[20] *See* e.g. International Energy Agency, *World Energy Outlook 2012 Executive Summary*, at 3 (2012), https://www.iea.org/publications/freepublications/publication/English.pdf; IPCC, Summary for Policymakers. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, at 27 (Stocker, T.F. et al. eds. 2013), https://archive.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf.

[21] IPCC, *Summary for Policy Makers, In: Global Warming of 1.5° C*, § C, at 14 (Oct. 2018), *available at*: https://www.ipcc.ch/sr15/chapter/summary-for-policy-makers/. For greater detail, *see also, id.*, Ch. 1, at 66, https://www.ipcc.ch/site/assets/uploads/sites/2/2019/02/SR15_Chapter1_Low_Res.pdf

[22] U.S. Global Change Research Program, *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*, (D.R. Reidmiller et al. eds., 2018), https://nca2018.globalchange.gov/ [hereinafter Assessment].

[23] Assessment *supra* note 24, Summary Findings, § 1, https://nca2018.globalchange.gov/.

lease sale and subsequent exploration and development will offset and undermine these efforts and will harm our States.

Increased greenhouse gas emissions from the Coastal Plain Lease Program will also harm the fragile Arctic ecosystem. The Coastal Plain is rapidly changing due to climate change. Accelerated melting of multiyear sea ice, increased boreal wildfires, reduction of terrestrial snow cover, and permafrost degradation are stark examples of the rapid Arctic-wide response to global warming.[24] Annual average near-surface air temperatures across Alaska and the Arctic have increased over the last 50 years at a rate more than twice as fast as the global average temperature. Increased temperatures on Alaska's North Slope contribute to thawing permafrost that releases carbon dioxide and methane that amplifies warming.[25]

2. The deficient FEIS analysis of greenhouse gas emissions and climate impacts.

The FEIS's analysis of greenhouse gas emissions and climate impacts from the Coastal Plain Lease Program violates NEPA's "hard look" mandate and undermines BLM's ability to make reasoned decisions by both underestimating the potential greenhouse gas emissions from Coastal Plain development and failing to meaningfully analyze the climate impacts associated with such development.

Although the FEIS acknowledges that Coastal Plain development will cause both direct and indirect greenhouse gas emissions, it drastically underestimates the indirect greenhouse gas emissions from Coastal Plain development. Despite the overwhelming and increasingly harmful impacts of climate change in the U.S. and around the world summarized above, BLM ignores the 2018 IPCC report's grave warning that an increase in global temperature of 1.5 degrees Celsius above preindustrial levels will significantly increase risks for human health, food security, biodiversity, national security, and global economies, asserting instead, and without evidence, that "there is not a climate crisis." In the FEIS, BLM summarily dismisses that report's unequivocal projection that without dramatic greenhouse gas reductions over the next decade, global temperatures will reach the 1.5 degree Celsius increase level as "rel[ying] on global climate models that have grossly overestimated the amount of warming (based on actual observations) from a given amount of GHG emissions …."[26] BLM further trivializes the importance of reducing U.S. and global emissions, stating that "[r]estricting GHG emissions, especially in just the [United States], which now represents a small and shrinking portion of global emissions, would not have a measurable effect on climate change globally or regionally in

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[24] U.S. Global Change Research Program, Climate Science Special Report: Fourth National Climate Assessment, Volume I, at 470 (Wuebbles, D.J., et al. eds. 2017) (*see* Chapter 11: Arctic Changes and their Effects on Alaska and the Rest of the United States).

[25] *Id.*

[26] FEIS, S-569.

Alaska."[27] In fact, the United States remains the second-largest contributor of carbon emissions in the world. Recent reports affirm that immediate and substantial global greenhouse gas emission reductions are essential to limiting the most harmful impacts of climate change in the U.S. and across the globe.

This FEIS further violates NEPA by underestimating the potential greenhouse gas emissions from Coastal Plain development in two ways. First, the FEIS analysis ignores the potential for Coastal Plain development to drive global supply and demand. Second, the FEIS analysis wrongly assumes that 96 percent of Coastal Plain oil and gas production will simply replace other U.S. fuels—mostly oil, natural gas, and coal—that would otherwise be developed. Oil and gas development in the Coastal Plain is particularly difficult and expensive because of its remote location, environmental conditions, and lack of existing pipelines, processing centers, and other infrastructure. Arctic Refuge oil is among the most expensive and uncertain of all undeveloped oil reserves across the globe.

The FEIS does not explain how Coastal Plain oil and gas, extremely expensive resources to explore and develop, will compete with cheaper domestic projects. Given the high cost of Coastal Plain production, this assumption overestimates the potential for Coastal Plain oil and gas to displace production from more economical projects elsewhere within the United States at the rate the FEIS projects.

A December 7, 2020 decision by the Ninth Circuit provides strong support for our States' claim that BLM's climate analysis for the Coastal Plain Lease Program violates NEPA. In *Center for Biological Diversity et al. v. Bernhardt*,[28] the Court held that the Bureau of Ocean Energy Management's ("BOEM") approval of an offshore oil drilling and production facility along the coast of Alaska in the Beaufort Sea unlawfully failed to quantify foreign oil consumption in its analysis of greenhouse gas emissions from the project. The Court found BOEM's NEPA climate analysis "misleading" because it failed to capture the emissions caused by increased global consumption in its estimate of downstream greenhouse gas emissions. "Emissions resulting from the foreign consumption of oil are surely a 'reasonably foreseeable' indirect effect of drilling."[29] The same is true for the Coastal Plain Oil and Gas Leasing Program.

3. The deficient FEIS analysis of emission costs.

The FEIS's greenhouse gas emission analysis further violates NEPA because it quantifies the economic benefits of Coastal Plain development without quantifying the costs of development, particularly costs from greenhouse gas emissions and associated climate change.

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[27] FEIS, S-581.

[28] *Center for Biological Diversity et al. v. Bernhardt*, Case No. 18-73400 (9th Cir. Dec. 7, 2020).

[29] *Id*.

NEPA requires that where an agency quantifies the benefits of a proposed action, the agency must also quantify the costs, including the social costs associated with greenhouse gas emissions, to ensure that the agency accurately analyzes the environmental consequences of its proposed action. The social cost of carbon is a federally developed tool to assist agencies in evaluating the social benefits of reducing carbon dioxide emissions when analyzing the costs and benefits of agency action. Because BLM failed to apply the social cost of carbon or another available metric to calculate the cost of development in the FEIS, the analysis is deficient under NEPA.

4. The deficient methane emissions analysis.

The FEIS also fails to meaningfully analyze climate change impacts from methane emissions. Methane is a potent greenhouse gas that is over 30 times more powerful than carbon dioxide in its ability to trap heat in the atmosphere over a 100-year time frame, and 86 times more potent over a 20-year time frame. Methane, thus, has significant short-term climate change impacts. Yet, in the FEIS, BLM improperly analyzed methane emissions and their climate impacts, further contributing to the deficient analysis of greenhouse gas emissions and climate impacts in the FEIS.

5. The deficient cumulative impacts analysis.

The FEIS further fails to discuss adequately the cumulative climate impacts of Coastal Plain development. Cumulative impacts are those impacts that result "from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions." 40 C.F.R. § 1508.7. NEPA thus obligates BLM to meaningfully consider in the FEIS the cumulative impacts of greenhouse gas emissions associated with the leases on climate change. The FEIS effectively ignored this NEPA obligation, devoting a mere paragraph to its analysis of the cumulative climate impacts of the proposed Leasing Program.

C. The FEIS's deficient migratory bird impact analysis violates NEPA.

Our States have a pronounced interest in the health of migratory birds on the Coastal Plain, especially because of the staggering net population loss of nearly three billion birds in North America since 1970.[30] Given the immense density (millions) and diversity (at least 156 species) of migratory birds on the Coastal Plain, the area's ecological importance cannot be overstated. The area is vital for conservation and population management of thousands of birds that fly 3,000 miles or more annually from breeding, molting, and resting areas in the Coastal Plain to the lower 48 states.

The FEIS analysis of the Leasing Program's impact on migratory birds in the Coastal Plain violates NEPA's "hard look" mandate and undermines BLM's ability to make reasoned

[30] Kenneth V. Rosenberg, et al., *Decline of the North American avifauna*, Science, Vol. 366, Issue 6461 (Oct. 4, 2019).

decisions about programmatic measures, including but not limited to lease stipulations, required operating procedures, and pre-leasing seismic activities. The FEIS analysis is incomplete, unsupported by current data or evidence, and cursory, thereby significantly impairing the agency's ability to make reasoned decisions.

Following Congress' authorization of the Leasing Program, lead experts from BLM, FWS, and other agencies compiled a Rapid Response Resource Assessment to identify actions that would be necessary to successfully implement the Leasing Program, including conducting studies to obtain the best available science and gathering baseline data necessary to assess potential impacts of development.[31] The FEIS irrationally dismisses its own experts' opinions about both the sufficiency of available information and the necessity to gather data as quickly as possible. The absence of critical baseline data about migratory birds, as acknowledged in the Rapid Response Resource Assessments, precluded BLM from making reasoned choices about impacts of pre-leasing seismic activity, which land to lease, and how to define conservation and management priorities, including what impacts to mitigate, whether mitigation proposed would be adequate to offset impacts, or why mitigation measures were not adopted. The contradiction and inconsistency between the Rapid Response Resource Assessments and the FEIS is arbitrary and irrational.

Without the necessary data to meaningfully analyze the Leasing Program's impact on migratory birds, BLM's analysis relies on generic, broad, and unsupported statements. When the FEIS does cite studies to support its conclusory statements, it improperly relies on stale data, some of which is more than forty years old. Updated geographic, population, and impact data are essential to make reasoned programmatic decisions for the Leasing Program, specifically those determining where and under what terms and conditions leasing will occur; those decisions cannot be remedied later with to-be-determined site-specific analysis.

Because of these myriad deficiencies, BLM's migratory bird impact analysis in the FEIS violates NEPA.

III. None of the Lease Tracts Noticed Can Lawfully Be Offered for Sale Because the Record of Decision Violates the Refuge Act and ANILCA.

BLM's Lease Sale Notice relies upon a FEIS and Record of Decision that unlawfully failed to determine that the Coastal Plain Lease Program is compatible with or fulfills the purposes of the Arctic Refuge and unlawfully prioritized oil and gas development over the Refuge's conservation purposes, in violation of the Refuge Act and ANILCA. Management of the Arctic Refuge is governed by ANILCA and the Refuge Act. The Refuge Act applies to all national wildlife refuges and directs the Secretary of the Interior "to administer a national

[31] FWS and BLM, "Rapid Response Resource Assessments and Select References for the 1002 Area of the Arctic National Wildlife Refuge in anticipation of an Oil and Gas Exploration, Leasing and Development Program per the Tax Act of 2017 Title II Sec 2001" (Feb. 16, 2018) (Rapid Response Resource Assessments).

network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." 16 U.S.C. § 668dd(a)(2); *see also id.* § 668dd(a)(4). Under the Refuge Act, "each refuge shall be managed to fulfill the mission of the System as well as the specific purpose for which that refuge was established." *Id.* at § 668dd(a)(3)(A).

The "purposes of the refuge" include purposes "specified in or derived from the law …[or] public land order … establishing, authorizing or expanding a refuge …." 16 U.S.C. § 668ee(10). ANILCA identifies four purposes for establishing the Arctic Refuge and guiding its management:

> (i) "to conserve fish and wildlife populations and habitats in their natural diversity," including "snow geese, peregrine falcons, and other migratory birds";
> (ii) "to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats";
> (iii) to provide opportunities for continued subsistence use by local residents; and (iv) to ensure water quality and necessary water quantity within the refuge.

ANILCA § 303(2)(B), Pub. L. No. 96-487. These four ANILCA purposes add to the three original management purpose of the Arctic National Wildlife Range: to preserve "unique wildlife, wilderness, and recreational values." PLO 2214. Under ANILCA, these three Range purposes "remain in force and effect." ANILCA § 305, Pub. L. No. 96-487.

Although the Record of Decision recognizes that the Tax Act "included a Coastal Plain oil and gas program as a refuge purpose on *equal footing* with the other refuge purposes,"[32] the Record of Decision unlawfully elevates the oil and gas program over the other refuge purposes stated in ANILCA. The Record of Decision does not contain a determination that the Leasing Program as authorized by BLM is a compatible use of the Arctic Refuge or that the Leasing Program fulfills the eight refuge purposes. Instead, the Record of Decision states only that it took the other refuge purposes into account and that there will be some impact on those purposes.[33]

IV. None of the Lease Tracts Noticed Can Lawfully Be Offered for Sale Because BLM Adopted an Unlawful Interpretation of The Tax Act that Eliminates Congress's Restrictions on Development in the Arctic Refuge.

BLM's Lease Sale Notice relies upon a Record of Decision that adopted an unlawful interpretation of the Tax Act by eliminating Congress's restrictions on development in the Arctic Refuge. The Record of Decision's interpretation of the Tax Act's 2,000-acre surface

[32] ROD, at 1 (emphasis added).

[33] ROD, at 7–8.

development limit applies only to a narrow subset of facilities that are both "production and support" facilities.[34] Under this interpretation, many facilities, including airstrips, roads, and gravel mines, that BLM previously considered in the FEIS to count toward the 2,000-acre surface disturbance limit may not count toward that limit under the authorized Leasing Program.[35] The Record of Decision further adopts a new interpretation of the rights-of-ways provision of the Tax Act that constructively would override the 2,000-acre surface development limit, stating that BLM must issue a right-of-way grant or necessary access authorizations.[36] The lease terms in the Detailed Statement of Sale reflect this as granting lease rights to access lands through off-lease right-of-ways.[37]

V. BLM Should Defer Noticing a Lease Sale Because Any Bids Now Will Not Generate Revenue Sufficient to Meet Congressional Intent.

A lease sale now will not result in lease contracts that will yield the anticipated $1.1 billion in federal revenues (of the $2.2 billion total revenue) to offset the lost revenue associated with passage of the Tax Act because Arctic Refuge oil reserves are uneconomic to produce and likely will remain so. As discussed below, the breakeven oil price for development in the Coastal Plain is estimated to be between $78 to $90 per barrel. Holding a lease sale with oil prices projected to remain *well* below that range, with futures trading under $49 per barrel, could completely undermine the Leasing Program's revenue generation potential by suppressing bidding participation and lease sales price.[38]

The Congressional Budget Office (CBO) report accompanying the legislative proposal enacted as the Tax Act estimated—erroneously—that the anticipated gross proceeds from the proposed Leasing Program would generate $2.2 billion in revenue over ten years, with half of that amount directed to the State of Alaska and the other half to the federal government.[39] A critical aspect of Congress's purpose in establishing the Leasing Program, therefore, is to offset the tax revenue loss resulting from passage of the Tax Act.[40]

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[34] ROD, at 11–13.

[35] ROD, at 13.

[36] ROD, at 9.

[37] BLM Detailed Statement of Sale, Ex. H (Dec. 7, 2020).

[38] *See* Energyzt, Advisors, LLC, *Economic Assessment of Proposed Oil and Gas Lease Sales in the Arctic National Wildlife Refuge Coastal Plain*, 1–4, 58–72 (March 2019), attached hereto as **Addendum B**.

[39] *See* Congressional Budget Office (CBO), *A Legislative Proposal Related to the Arctic National Wildlife Refuge* (Nov. 8, 2017), at 2–3, https://www.energy.senate.gov/public/index.cfm/files/serve?File_id=3454269F-6DC5-4E6C-9F23-99D1E3E64698.

[40] *See* 163 Cong. Rec. S7394-01, 2017 WL 5892551 (November 29, 2017) (Wyoming Senator Mike Enzi, Senate Budget Committee chair, commenting that: "[o]n November 15 [2017], . . . the [Senate Energy and Natural Resources] committee approved . . . legislation authorizing responsible development in the 1002 area [of ANWR] and meeting the $1 billion reconciliation deficit reduction target.") *See also* Congressional Budget Office Cost Estimate, *Reconciliation Recommendations of the Senate Committee on Energy and Natural Resources* (November

This CBO revenue-generation estimate assumed that lease sales in the Coastal Plain would eventually lead to production of between 1.5 and 10.6 billion barrels of oil[41] based on projections that oil prices will hover around $80 per barrel through 2025, and, at the high end, would rise to over $100 per barrel by 2030. As the U.S. Energy Information Administration acknowledges, these projections are highly uncertain due to insufficient information about the location, size, and quality of oil or gas reserves in the Coastal Plain, inherent uncertainty about market dynamics, and multiple factors that affect the timing and cost of potential development.

The economics of long-term investments in Artic Refuge resources are highly sensitive to fluctuations in production costs and oil prices. Oil and gas development in the Coastal Plain is particularly difficult and expensive because of its remote location, environmental conditions, and lack of existing pipelines, processing centers, and other infrastructure.[42] Indeed, Arctic Refuge oil is among the most expensive and uncertain of all undeveloped oil reserves and would be nearly the last resource to be developed.[43]

Recent analyses estimate that the price of oil must reach between $78 and $90 per barrel for drilling on the Coastal Plain to become economically viable.[44] But global oil prices ranged between $55 and $70 per barrel for several years up until early 2020,[45] when prices plummeted because of, among other economic factors, the global coronavirus pandemic. Over the past several months, oil prices have stabilized in the $40 to $43 per barrel range.[46] Brent crude oil

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21, 2017), https://www.cbo.gov/system/files/115th-congress-2017-2018/costestimate/senrreconciliationrecommendations.pdf, (finding, "CBO estimates that gross proceeds from bonus bids paid for the right to develop leases in ANWR would total $2.2 billion over the 2018-2027 period . . . leaving net federal receipts totaling $1.1 billion over the 2018-2027 period."); 163 Cong. Rec. S8088-02, 2017 WL 6513857 (December 19, 2017).

[41] Estimates of the total volume of recoverable oil reserves are based on a twenty-year-old, 1998 U.S. Geological Survey (USGS) study that used limited information from two seismic surveys performed about thirty-five years ago. A 2016 analysis of this old data determined that the total quantity of technically recoverable oil within Coastal Plain ranged from 4.3 billion (b) barrels (five percent probability), to 11.8b barrels (95 percent probability), with a mean probability of 7.7b barrel. *See* USGS, ARCTIC NATIONAL WILDLIFE REFUGE, 1002 AREA, PETROLEUM ASSESSMENT, 1998, INCLUDING ECONOMIC ANALYSIS, FACT SHEET 0028–01: Online Report, https://pubs.usgs.gov/fs/fs-0028-01/fs-0028-01.htm (last updated Nov. 29, 2016). *See also* Energyzt, *Economic Assessment of Proposed Oil and Gas Lease Sales in the Arctic National Wildlife Refuge Coastal Plain*, *supra* note 38, at 9–11.

[42] *See* Energyzt,, *Economic Assessment of Proposed Oil and Gas Lease Sales in the Arctic National Wildlife Refuge Coastal Plain*, *supra* note 38, at ES-2, 4–9. *See also* Cong. Research Serv., ANWR Overview, *supra* note 4, at 10.

[43] *See id.* at ES-2.

[44] *See id*. at 17–19, 71.

[45] *Id.* at 17–19.

[46] *See* EIA SHORT-TERM ENERGY OUTLOOK, https://www.eia.gov/outlooks/steo/index.php

futures are currently trading under $49 per barrel[47]—a far cry from the estimated $78 to $90 per barrel breakeven price needed to make Coastal Plain drilling projects viable.

Thus, a lease sale now will not generate anything near the lease revenue envisioned by Congress. If anything, the price paid would reflect a heavily discounted estimate of the extrinsic value associated with an asset that currently is "out-of-the-money" (i.e., more expensive than market prices would support). Under current and projected conditions, revenues would be *far* less than the $2.2 billion originally projected by the CBO.

If oil prices fail to raise above the $78 - $90 per barrel breakeven point over the next twenty years, as multiple current projections indicate, Coastal Plain leases may not result in actual oil development and production, which would eliminate, the royalty payments to offset federal revenue losses from the Tax Act.[48] Even if development becomes economically viable with oil prices rising over $100 per barrel, as U.S. EIA's analysis assumes, potential royalty payments would not begin until 2031, and, together with lease sales and bonus bid revenue and rent payments, total revenue generation may still be *well* under the total intended $2.2 billion, with $1.1 billion for federal deposit.[49]

Given current and anticipated market conditions, potential revenues from Arctic Refuge oil are unlikely to generate the hoped-for federal revenue levels.[50] Indeed, even if BLM received and accepted bids on all Coastal Plain tracts offered for lease, any resulting oil and gas development would not provide a meaningful economic benefit in light of the severe environmental consequences of developing the Coastal Plain.[51] For these reasons and because of the multiple legal challenges to BLM's environmental review and Record of Decision authorizing the Coastal Plain Lease Program, including our States' lawsuit, and noticed January 6, 2021 lease sale, six major banks—Bank of America, Morgan Stanley, Wells Fargo, Goldman Sachs, JPMorgan Chase, and Citigroup—have committed to not providing any financing for oil and gas exploration or development in the Coastal Plain.[52]

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[47] *See* CME Group, OIL FUTURES QUOTES, https://www.cmegroup.com/trading/energy/crude-oil/brent-crude-oil.html (updated December 10, 2020). *See also* current EIA ENERGY OUTLOOK, Crude Oil, https://www.eia.gov/outlooks/steo/marketreview/crude.php (updated December 3, 2020).

[48] *Id*. at ES 1–4, 69–71.

[49] *Id*. at ES 1–4, 66–71.

[50] *Id*.; *See also* Congressional Budget Office Cost Estimate, *supra* note 39, at 3.

[51] *See* Energyzt, *Economic Assessment of Proposed Oil and Gas Lease Sales in the Arctic National Wildlife Refuge Coastal Plain*, *supra* note 38, at ES 1–4, 66–71.

[52] *See* Rachel Koning Beals, *Bank of America joins big U.S. banks that won't finance oil in the Arctic refuge Trump opened to drilling*, MarketWatch (Dec. 1, 2020, updated Dec. 5, 2020), https://www.marketwatch.com/story/bank-of-america-joins-big-u-s-banks-that-wont-finance-oil-in-the-arctic-refuge-trump-opened-to-drilling-11606843342

VI. Conclusion

For all of the above reasons, the undersigned States strongly urge BLM to withdraw the December 7, 2020, notice of lease sale, cancel the January 6, 2021, lease sale, and withdraw the Record of Decision and FEIS authorizing the Coastal Plain Lease Program.

Respectfully submitted,

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ADDENDUM A

The States' Complaint in

***Washington et al. v. Bernhardt,* Case No 3:20-cv-00224-SLG**

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THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF ALASKA

STATE OF WASHINGTON, COMMONWEALTH OF MASSACHUSETTS, STATE OF CALIFORNIA, STATE OF CONNECTICUT, STATE OF DELAWARE, STATE OF ILLINOIS, STATE OF MAINE, STATE OF MARYLAND, THE PEOPLE OF	Case No. 3:20-CV-00224-JMK

THE STATE OF MICHIGAN, STATE OF MINNESOTA, STATE OF NEW JERSEY, STATE OF NEW YORK, STATE OF OREGON, STATE OF RHODE ISLAND, and STATE OF VERMONT,

Plaintiffs,

v.

DAVID BERNHARDT, in his official capacity as Secretary of the Interior, UNITED STATES DEPARTMENT OF THE INTERIOR, and BUREAU OF LAND MANAGEMENT,

Defendants.

COMPLAINT FOR DECLARATORY AND INJUNCTIVE RELIEF

(Administrative Procedure Act, 5 U.S.C. §§ 701–06; Alaska National Interest Lands Conservation Act, Pub. L. No. 96-487 §§ 303(2)(B), 304(a), (b), 94 Stat. 2371, 2390, 2393 (1980); National Environmental Policy Act, 42 U.S.C. §§ 4331, 4332; National Wildlife Refuge System Administration Act, 16 U.S.C. §§ 668dd–668ee; and Tax Cuts and Jobs Act of 2017, Pub. L. No. 115-97 tit. 2, § 20001, 131 Stat. 2054, 2235–37)

I. INTRODUCTION

1. The Secretary of the Interior, the Department of the Interior, and the Bureau of Land Management (BLM) (collectively Defendants) unlawfully authorized the Coastal Plain Oil and Gas Leasing Program (Leasing Program), opening the unspoiled Coastal Plain of the Arctic National Wildlife Refuge (Arctic Refuge) to expansive oil and gas exploration and development based on an inadequate environmental review and an unlawful Record of Decision. Defendants' actions violate the National Environmental Policy Act (NEPA), the National Wildlife Refuge System Administration Act (Refuge

Administration Act), the Alaska National Interest Lands Conservation Act (ANILCA), the Administrative Procedure Act (APA), and the Tax Cuts and Jobs Act of 2017 (Tax Act).

2. Our nation's largest and wildest refuge, the Arctic Refuge is often referred to as "America's Serengeti," and the Coastal Plain serves as the Refuge's center of vital wildlife activity.

3. The Coastal Plain is a 1.56 million-acre national treasure, unparalleled in its biological significance for hundreds of species, including caribou, threatened polar bears, and millions of birds that migrate to and from six continents and through all 50 states.

4. With the Arctic Ocean's Beaufort Sea to the north and the Mollie Beattie Wilderness to the south, the Coastal Plain's fragile ecosystem on the northeastern edge of the Arctic Refuge—an area sacred to the Gwich'in people—is particularly vulnerable to environmental stressors, including climate change, which has caused thinning sea ice and thawing of permafrost in the region.

5. In 1960, the Department of the Interior initially protected 8.9 million acres of the current Arctic Refuge, including the Coastal Plain. Twenty years later, recognizing the area's unrivaled and inestimable conservation value and its importance to all Americans including future generations, Congress passed legislation to solidify and expand those protections by creating the 19-million acre Arctic Refuge and prohibiting oil and gas development and production there.

6. In 2017, however, Congress abruptly ended the nearly 40-year ban on oil and gas development on the Coastal Plain through provisions in the Tax Act that direct the Secretary of the Interior, through BLM, to develop and administer an oil and gas leasing program in the Coastal Plain with specific limitations on the scope of the program. Congress did not otherwise waive or alter the framework of laws protecting the Arctic Refuge or exempt Defendants from conducting a complete, careful, and robust environmental review.

7. Defendants' insufficient environmental review and Record of Decision that opens the entire Coastal Plain to oil and gas leasing and development are unlawful. Defendants' actions severely underestimate the avoidable and irreparable damage to vital habitat and pristine waters, imperil wildlife already struggling to thrive in a rapidly changing ecosystem, and increase greenhouse gas emissions at a time when our nation and the world drastically need to reduce emissions to mitigate the most extreme harms of climate change.

8. Specifically, through the Record of Decision and Final Environmental Impact Statement (FEIS), Defendants: (1) failed to determine that the authorized leasing program is compatible with the purposes of the Arctic Refuge and unlawfully prioritized oil and gas development over the Refuge's conservation purposes, in violation of the Refuge Administration Act, ANILCA, and the APA; (2) failed to consider a reasonable range of program alternatives including an alternative that serves the conservation

purposes of the Arctic Refuge, in violation of NEPA and the APA; (3) failed to take a hard look at impacts on greenhouse gas emissions and climate change, in violation of NEPA and the APA; (4) failed to take a hard look at impacts on migratory birds, in violation of NEPA and the APA; and (5) adopted an unlawful interpretation of the Tax Act contrary to Congress's restrictions on development in the Arctic Refuge, in violation of that Act and the APA.

9. Accordingly, Plaintiffs seek a declaration that the Defendants violated the Refuge Administration Act, ANILCA, the APA, NEPA, and the Tax Act; and request that the Court vacate and set aside the Record of Decision and the FEIS and enjoin any further Leasing Program activities.

II. JURISDICTION AND VENUE

10. This Court has jurisdiction over Plaintiffs' claims pursuant to 28 U.S.C. § 1331 (action arising under the laws of the United States).

11. An actual controversy exists between the parties within the meaning of 28 U.S.C. § 2201(a), and the Court may grant declaratory and injunctive relief, including vacatur of illegal agency actions, under 28 U.S.C. §§ 2201–02 and 5 U.S.C. §§ 705–06.

12. The United States has waived sovereign immunity for claims arising under the APA. 5 U.S.C. § 702.

13. Plaintiffs are each a "person" within the meaning of 5 U.S.C. § 551(2), authorized to bring suit under the APA to challenge unlawful final agency action. 5 U.S.C. § 702.

14. Defendants' FEIS and Record of Decision are final agency actions subject to judicial review.

15. Plaintiffs have exhausted all available administrative remedies.

16. Venue is proper in this Court pursuant to 28 U.S.C. § 1391(e) because the Arctic Refuge is located within this judicial district and a substantial part of the events or omissions giving rise to Plaintiffs' claims occurred within this judicial district.

III. PARTIES

A. Plaintiffs

17. Plaintiffs the State of Washington, by and through Attorney General Robert W. Ferguson; the Commonwealth of Massachusetts, by and through Attorney General Maura Healey; the State of California by and through Attorney General Xavier Becerra; the State of Connecticut by and through Attorney General William Tong; the State of Delaware by and through Attorney General Kathleen Jennings; the State of Illinois by and through Attorney General Kwame Raoul; the State of Maine by and through Attorney General Aaron M. Frey; the State of Maryland by and through Attorney General Brian E. Frosh; the People of the State of Michigan by and through Attorney General Dana Nessel; the State of Minnesota by and through Attorney General Keith Ellison; the

State of New Jersey by and through Attorney General Gurbir Grewal; the State of New York by and through Attorney General Letitia James; the State of Oregon by and through Attorney General Ellen Rosenblum; the State of Rhode Island, by and through Attorney General Peter F. Neronha; and the State of Vermont by and through Attorney General Thomas J. Donovan Jr. (collectively "State Plaintiffs") bring this action to challenge Defendants' Record of Decision published on August 17, 2020, and the associated FEIS published on September 25, 2019.

18. Plaintiff STATE OF WASHINGTON is a sovereign entity and brings this action to protect its sovereign and proprietary rights over its natural resources, including approximately three million acres of trust lands, 2.6 million acres of aquatic lands, and thousands of birds. Washington has proprietary rights for wildlife, fish, shellfish, and tidelands. Wash. Const. art. XVII, § 1; Wash. Rev. Code § 77.04.012. Washington also has statutory responsibility to conserve, enhance, and properly utilize the State's natural resources. Wash. Rev. Code §§ 77.110.030, 90.03.010, 90.58.020; *see also* Wash. Const. art. XVI, § 1. The Attorney General is the chief legal advisor to the State of Washington, and his powers and duties include acting in federal court on matters of public concern. This challenge is brought pursuant to the Attorney General's statutory and common law authority to bring suit and obtain relief on behalf of Washington.

19. Washington is a member of the Pacific Flyway Council, an administrative body consisting of public wildlife agencies that, among other things, sets migratory bird

policy and regulations and contributes to migratory bird research for the major migratory route that extends from Alaska to South America. Snow geese, long-tailed ducks, black brant, red-throated loons, Pacific loons, western sandpipers, and golden plovers migrate along the Pacific Flyway from the Coastal Plain to Washington. Washington has designated long-tailed ducks as a Species of Greatest Conservation Need, given its declining population in the state, and has expended efforts and resources to manage its population. Washington also expends efforts and resources to manage its population of snow geese, which are one of the most abundant species on the Coastal Plain.

20. Washington has a significant economic interest in its wildlife. In 2011, bird and other wildlife watchers expended $3.2 billion in Washington and generated an economic impact of about $5.5 billion, with migratory bird watching being an essential component of that economic impact. Washington grows 45% of the nation's clams, oysters, and mussels. The state's shellfish industry contributed $184 million to Washington's economy in 2010 and employed 2,710 workers.

21. Washington's five oil refineries were designed and constructed to refine Alaskan crude oil, which arrives to the state via vessel. Although production from the Alaska North Slope has decreased over the last decade, it continues to be the largest source of crude oil for Washington refineries. Washington reasonably expects to receive oil extracted from the Arctic Refuge and to bear the impact of the oil transiting via Washington waterways and tidelands, emitting pollutants into Washington air during the

refinery process, being distributed throughout and from the state as fuel, and contributing to the potential worker safety hazards associated with refinery operations.

22. By and through its chief legal officer, Attorney General Maura Healey, Plaintiff COMMONWEALTH OF MASSACHUSETTS brings this action on behalf of itself and its residents to protect the Commonwealth's sovereign and proprietary interest in the conservation and protection of its natural resources and the environment. *See* Mass. Const. amend. art. 97; Mass. Gen. Laws ch. 12, §§ 3 and 11D. Massachusetts has an interest in protecting migratory bird species and other wildlife in the Commonwealth from harm both within and outside of Massachusetts.

23. The Commonwealth has enacted and devotes significant resources to implementing numerous laws concerning the management, conservation, protection, restoration, and enhancement of the Commonwealth's wildlife resources, including migratory birds and other avifauna. *See, e.g.*, Mass. Gen. Laws ch. 131. As early as 1818, the Commonwealth recognized the public health, environmental, and economic benefits that certain migratory birds provided to Massachusetts and its citizens and became one of the first states in the country to protect them while they remained in the Commonwealth's territory. An Act to Prevent the Destruction of Certain Useful Birds at Unseasonable Times of the Year, 1817 Mass. Acts ch. 103.

24. Multiple migratory shorebird species stop to feed or rest in Massachusetts as they migrate to or from breeding grounds in the Coastal Plain, including the American

golden-plover, whimbrel, semipalmated sandpiper, and the blackpoll warbler. Massachusetts has substantial economic interest in the protection of wildlife, including birds that migrate from the Coastal Plain through Massachusetts. The Commonwealth is home to world-class birding destinations, including Cape Cod and the Great Meadows National Wildlife Refuge. In 2011 alone, birdwatchers and other wildlife watchers spent nearly $1.3 billion in Massachusetts, generating approximately $2.3 billion in economic impact.

25. Plaintiff STATE OF CALIFORNIA brings this action by and through Attorney General Xavier Becerra. The Attorney General is the chief law enforcement officer of the state and has the authority to file civil actions in order to protect public rights and interests, including actions to protect the natural resources of the state. Cal. Const. art. V, § 13; Cal. Gov't Code §§ 12600–12. This challenge is brought in part pursuant to the Attorney General's independent authority to represent the people's interests in protecting the environment and natural resources of California from pollution, impairment, or destruction. Cal. Const. art. V, § 13; Cal. Gov't Code §§ 12511, 12600–12; *D'Amico v. Bd. of Med. Exam'rs,* 520 P.2d 10, 14–15 (Cal. Sup. Ct. 1974).

26. The State of California has a sovereign interest in its natural resources and is the sovereign and proprietary owner of all the state's fish and wildlife resources, including migratory birds, which are state property held in trust by the state for the benefit of the people of the state. *People v. Truckee Lumber Co.*, 48 P. 374, 374 (Cal.

Sup. Ct. 1897); *Nat'l Audubon Soc'y v. Superior Ct.*, 658 P.2d 709, 727 (Cal. Sup. Ct. 1983); Cal. Water Code § 102; Cal. Fish & Game Code §§ 711.7(a), 1802. California, like other Pacific coastal states, is a member of the Pacific Flyway Council. Migratory birds in particular support a burgeoning birdwatching and hunting industry, which is important to California's people and economy.

27. California thus has a significant interest in preventing harm to migratory birds, including those that breed on the Coastal Plain and winter in California or pass through the state during migration. These species include snow geese, semipalmated plover, ruddy turnstone, long-billed dowitcher, black-bellied plover, sanderling, and dunlin, among others.

28. California also has a sovereign interest in preventing adverse health and environmental impacts from fossil fuel development. In 2019, California refineries processed more than 73 million barrels of Alaska crude oil, accounting for 11.9% of the refineries' total production. Exposure to pollutants produced by these refineries—which include carbon monoxide, benzene, formaldehyde, and arsenic—can cause cancer, birth defects, and asthma, among other health impacts, especially in environmental justice communities that are disproportionately affected by industrial pollution. Refineries also produce high levels of greenhouse gases, thus further contributing to the climate harms caused by oil and gas extraction.

29. Plaintiff STATE OF CONNECTICUT brings this action by and through Attorney General William Tong. The Attorney General of Connecticut is generally authorized to have supervision over all legal matters in which the State of Connecticut is a party. He is also statutorily authorized to appear for the state "in all suits and other civil proceedings, except upon criminal recognizances and bail bonds, in which the state is a party or is interested . . . in any court or other tribunal, as the duties of his office require; and all such suits shall be conducted by him or under his direction." Conn. Gen. Stat. § 3-125.

30. Pursuant to the Connecticut Endangered Species Act, Conn. Gen. Stat. § 26-303 *et seq.*, it is the position of the Connecticut General Assembly that those species of wildlife and plants that are endangered or threatened are of "ecological, scientific, educational, historical, economic, recreational and aesthetic value to the people of the state, and that the conservation, protection, and enhancement of such species and their habitats are of state-wide concern." Conn. Gen. Stat. § 26-303. As a consequence, "the General Assembly [of Connecticut] declares it is a policy of the state to conserve, protect, restore, and enhance any endangered or threatened species and essential habitat." *Id.* A large number of migratory bird species, including a number that are endangered or threatened, stop or overwinter in Connecticut during migration to and from the Coastal Plain. Whimbrels, horned grebes, American golden-plovers, tundra swans, semipalmated sandpipers, snow geese, and greater scaups are among the species that frequent the

Coastal Plain and have been documented to feed and rest in Connecticut while migrating further south.

31. Plaintiff STATE OF DELAWARE is a sovereign entity and brings this action on its own behalf and on behalf of its citizens and residents to protect its sovereign and proprietary rights. The Attorney General is the chief legal officer for the State of Delaware, whose powers include acting in federal court on matters of public concern. This challenge is brought pursuant to the Attorney General's independent constitutional, statutory, and common law authority to bring suit and obtain relief on behalf of Delaware.

32. Migratory bird species present in the Coastal Plain stop or overwinter in Delaware during migration, including tundra swans, snow geese, peregrine falcons, semipalmated sandpipers, American golden-plovers, and blackpoll warblers. Numerous locations in Delaware are key locations for migratory bird species, including Bombay Hook National Wildlife Refuge, Prime Hook National Wildlife Refuge, and an extensive state park system along Delaware's coastline and in the Delaware Bay and other inland water bodies. Horseshoe crab eggs in the Delaware Bay provide vital nutrition for migratory bird species including the semipalmated sandpiper and red knot.

33. Delaware has substantial economic interest in the protection of wildlife, including birds that migrate from the Coastal Plain. Data from 2011 indicates that at least 200,000 Delawareans identify as wildlife watchers and sought birds as part of their

wildlife viewing opportunities. In 2011, bird and other wildlife watching generated approximately $170 million in revenue in Delaware. The fishing, tourism, and recreation sectors and coast-related activities contribute almost $7 billion in economic production to the state, directly or indirectly support more than 60,000 jobs, and generate more than 10% of the state's total employment, taxes, and production value. Delaware has enacted and devotes significant resources to implementing laws concerning the management, conservation, protection, restoration, and enhancement of the state's protected lands and wildlife, including migratory birds. *See, e.g.*, Del. Code Ann. tit. 7 chs. 1, 2, 6, 7, 13, 45, 47, 66, 66A, 73, 75.

34. Plaintiff STATE OF ILLINOIS brings this action by and through Attorney General Kwame Raoul. The Attorney General is the chief legal officer of the State of Illinois, Ill. Const., art V, § 15, and "has the prerogative of conducting legal affairs for the State," *Envt'l Prot. Agency v. Pollution Control Bd.*, 372 N.E.2d 50, 51 (Ill. Sup. Ct. 1977). He has common law authority to represent the People of the State of Illinois and "an obligation to represent the interests of the People so as to ensure a healthful environment for all the citizens of the State." *People v. NL Indus.*, 103 604 N.E.2d 349, 358 (Ill. Sup. Ct. 1992).

35. Illinois has an interest in protecting migratory birds and other wildlife from harm. The state lies on the Mississippi Flyway, where millions of birds migrate every year. Under the Illinois Wildlife Code, Illinois has "ownership of and title to all wild

birds . . . within the jurisdiction of the State." 520 Ill. Comp. Stat. 5/2.1. Illinois protects numerous migratory bird species that nest in or migrate through the state. *Id.* at 5/2.2; *see also United Taxidermists Ass'n v. Ill. Dept. of Nat. Res.*, 436 Fed. Appx. 692, 695 (7th Cir. 2011). Furthermore, Illinois' laws protect endangered species and their habitat. *E.g.*, 520 Ill. Comp. Stat. 10, 20.

36. Plaintiff STATE OF MAINE, a sovereign state, brings this action by and through Attorney General Aaron M. Frey. The Attorney General of Maine is a constitutional officer with the authority to represent the State of Maine in all matters and serves as its chief legal officer with general charge, supervision, and direction of the state's legal business. Me. Const. art. IX, § 11; 5 M.R.S.A. §§ 191–205. The Attorney General's powers and duties include acting on behalf of the state and the people of Maine in the federal courts on matters of public interest. The Attorney General has the authority to file suit to challenge action by the federal government that threatens the public interest and welfare of Maine residents as a matter of constitutional, statutory, and common law authority.

37. Maine has an interest in protecting its natural resources, its wildlife, and its economy from the direct and indirect impacts of the Leasing Program. There is a direct connection between Maine wildlife and the Arctic Refuge, as certain species of birds use both Maine and the Coastal Plain of the Arctic Refuge as habitat. Migratory bird species rest and feed in Maine during their migration to and from the Coastal Plain and some

species spend the winter in Maine. Radio telemetry has confirmed individual whimbrels, least terns, and semi-palmated sandpipers traveling between the Coastal Plain of the Arctic Refuge and Maine in their annual migration. These migratory birds feed in Maine's blueberry barrens and use Maine's tidal flats for feeding, resting, and nesting. Maine's coastline contains over 22,000 acres of tidal marshes, providing rich feeding grounds for migratory and over-wintering birds from the Coastal Plain of the Arctic Refuge. There are between 3,000 and 4,000 islands and ledges off the coast of Maine that also host nesting and feeding migrating birds.

38. Maine has a substantial economic interest in protecting these species, as Maine is a renowned birding destination. Birding by residents and tourists, especially along the scenic coast and on coastal islands, infuses a significant amount of money into Maine's economy. The opportunity to view species that spend a portion of their lives on the Coastal Plain of the Arctic Refuge draws birders to the Maine Coast.

39. Plaintiff STATE OF MARYLAND brings this action by and through its Attorney General, Brian E. Frosh. The Attorney General of Maryland is the state's chief legal officer with general charge, supervision, and direction of the state's legal business. Under the Constitution of Maryland, and as directed by the Maryland General Assembly, the Attorney General has the authority to file suit to challenge action by the federal government that threatens the public interest and welfare of Maryland residents. Md. Const. art. V, § 3(a)(2); Md. Code Ann., State Gov't § 6-106.1.

40. Maryland's Chesapeake Bay provides important wintering habitat for species like tundra swans, semipalmated sandpipers, black-bellied and American golden-plovers, long-tailed ducks, and snow geese that breed along the Coastal Plain. The arrival of these long-distance migrants each winter draws visitors to places like Sandy Point State Park, Deal Island Wildlife Management Area, Jug Bay Wetlands Sanctuary, and Blackwater National Wildlife Refuge. Maryland's portion of the Chesapeake Bay is particularly important to tundra swans as roughly 30% of the entire eastern population winters within the state.

41. By and through Michigan State Attorney General Dana Nessel, Plaintiff PEOPLE OF THE STATE OF MICHIGAN bring this action to defend their sovereign and proprietary interests. Mich. Comp. Laws § 14.28. Conserving Michigan's natural resources is of "paramount public concern." Mich. Const. art. IV, § 52. The People of the State of Michigan seek to defend their interest in migratory birds that spend time in the Coastal Plain and Michigan. The people of the State of Michigan also seek to protect their interest against harm caused by climate change.

42. Michigan is located largely within the Mississippi Flyway and is also on the western edge of the Atlantic Flyway and the eastern edge of the Central Flyway. Because of this, and combined with Michigan's substantial bird habitat along the Great Lakes, inland lakes, and wetlands, many migrating birds stopover in Michigan during different times of the year, including eastern tundra swans and four species of ducks that nest in

the Coastal Plain and make long-distance migrations that include stopovers in Michigan. Tundra swans are of particular interest to recreational birdwatchers in the state, and Michigan regulates hunting for all four duck species.

43. Additional shorebirds that breed in the Coastal Plain and migrate through Michigan include American golden-plover, semipalmated sandpiper, black-bellied plover, pectoral sandpiper, Stilt sandpiper, Baird's sandpiper, long-billed dowitcher, semipalmated plover, dunlin, and red-necked phalarope.

44. Michigan receives significant income from waterfowl hunters and recreational birdwatchers. In 2012, waterfowl hunters spent $22.7 million on hunting trips in Michigan. In 2011, two million people observed birds in Michigan and 41% of those people took birdwatching trips. Wildlife watchers, approximately half a million of which specifically observe waterfowl, spent $1.2 billion on wildlife watching in Michigan in 2011.

45. By and through its chief legal officer, Attorney General Keith Ellison, Plaintiff MINNESOTA brings this action on behalf of itself and its residents to protect Minnesota's interest in its natural resources and the environment. The Minnesota Legislature, "recognizing the profound impact of human activity on the interrelations of all components of the natural environment, . . . [has] declare[d] that it is the continuing policy of the state government . . . to use all practicable means and measures . . . to create and maintain conditions under which human beings and nature can exist in productive

harmony, and fulfill the social, economic, and other requirements of present and future generations of the state's people." Minn. Stat. § 116D.02. Minnesota has enacted and devotes significant resources to implementing numerous laws concerning the management, conservation, protection, restoration, and enhancement of its wildlife resources, including migratory birds and other avifauna. *See, e.g.*, Minn. Stat. ch. 97A.

46. Dozens of migratory bird species fly over Minnesota during migration to and from the Coastal Plain. Greater white-fronted geese, snow geese, tundra swans, American wigeons, northern pintails, and red-breasted mergansers are among the species that use the Coastal Plain as a critical breeding ground and are also found in Minnesota. Plaintiff Minnesota has substantial economic interest in the protection of wildlife, including birds that migrate from the Coastal Plain through Minnesota. In 2006, approximately 52,000 waterfowl hunters spent more than $28 million on trip and equipment expenditures. The industry created 653 jobs and had a total economic impact of $43 million. Healthy waterfowl-breeding grounds, including those in the Coastal Plain area, are critical to support this industry.

47. Plaintiff STATE OF NEW JERSEY is a sovereign state of the United States of America and brings this action on behalf of itself and as a trustee, guardian, and representative of the residents and citizens of New Jersey. The New Jersey Legislature has declared that New Jersey's lands and waters constitute a unique and delicately balanced resource and that these resources should be protected and preserved to promote

the health, safety and welfare of the people of the state. N.J. Stat. Ann. § 58:10-23.11a. New Jersey holds wildlife in trust for the benefit of its people. It is the policy of the state to manage all forms of wildlife to insure continued participation in the ecosystem. N.J. Stat. Ann. § 23:2A-2.

48. New Jersey beaches and wetlands provide vital resting grounds for shorebirds migrating to their summer breeding grounds in the Arctic. The Delaware Bay is a critical stop for at least six arctic-nesting shorebirds. The Nature Conservancy's South Cape May Meadows, Gandy's Beach Preserve, and Sunray Beach Preserve are examples of important habitats in the Delaware Bay ecosystem upon which migratory shorebirds depend to refuel and rest. Migratory shorebirds are an integral part of the state's ecosystem and are a world-renowned bird-watching phenomenon.

49. Plaintiff STATE OF NEW YORK is a sovereign state of the United States of America and brings this action on behalf of itself and as trustee, guardian, and representative of all residents and citizens of New York to protect their interests, and in furtherance of the state's sovereign and proprietary interests in the conservation and protection of the state's natural resources and the environment, and particular, in the protection of migratory bird species and other wildlife in the state from harm both within and outside of its borders.

50. New York owns all wildlife in the state. N.Y. Envtl. Conserv. Law § 11-0105. This wildlife includes multiple bird species associated with the Coastal Plain,

which stop in New York on their migration routes. These include, among others, the semipalmated sandpiper, American golden-plover, whimbrel, and tundra swan. The semipalmated sandpiper, listed as a "Near Threatened Species" by the International Union for Conservation and Nature, has been observed at marshes and coastal areas of Long Island, while tundra swan populations have been observed in central and western parts of New York. From bird banding data, additional bird species such as the canvasback, greater scaup, and lesser scaup have been demonstrated to migrate from Alaska to New York.

51. The birdwatching industry is an important recreational activity and contributor to economic activity in New York, with many residents and visitors interested in catching glimpses of rare birds during their migration. According to the U.S. Fish and Wildlife Service, four million bird and wildlife watchers spent more than $4 billion in New York, ranking New York first among all states for these types of expenditures. Over one million people took trips away from home to view wild birds in New York.

52. Plaintiff STATE OF OREGON brings this suit by and through Attorney General Ellen Rosenblum. The Oregon Attorney General is the chief legal officer of the State of Oregon. The Attorney General's duties include acting in federal court on matters of public concern and upon request by any state officer when, in the discretion of the Attorney General, the action may be necessary or advisable to protect the interests of the state. Ore. Rev. Stat. § 180.060(1). The Oregon Department of Fish and Wildlife,

established as a state agency by the Oregon Legislature pursuant to Oregon Revised Statute section 496.080, has requested that the Attorney General bring this suit to protect Oregon's sovereign interest in preserving wildlife.

53. Plaintiff Oregon's interest in the Leasing Program's environmental impacts emanates in part from its sovereign and proprietary rights over its natural resources. Oregon owns over two million acres of land. In addition, under Oregon law, "Wildlife is the property of the state." Or. Rev. Stat. § 498.002. The Oregon Department of Fish and Wildlife manages wildlife to prevent serious depletion of any indigenous species and to provide recreational and aesthetic benefits for present and future generations of Oregonians. Or. Rev. Stat. § 496.012.

54. As Oregon is a Pacific coast state and part of the Pacific Flyway, migratory birds, many of which migrate between the Coastal Plain and Oregon, are a vital part of Oregon's landscape, history, and economy. For example, the Coastal Plain is one of the most important areas for black brant that winter in the Pacific Flyway. Marking of black brant has demonstrated that individual birds breeding in the Coastal Plain currently winter in Oregon's bays. Any land management which negatively impacts black brant on the Coast Plain is likely to have a negative impact to the overall population and to Oregon's wintering flock.

55. Plaintiff STATE OF RHODE ISLAND is a sovereign entity and brings this action to protect its sovereign and proprietary rights. The Attorney General is the chief

legal advisor to the State of Rhode Island, and his powers and duties include acting in federal court on matters of public concern. This challenge is brought pursuant to the Attorney General's statutory and common law authority to bring suit and obtain relief on behalf of the State of Rhode Island.

56. Rhode Island has sovereign and propriety interests in protecting its state resources through careful environmental review at both the state and federal levels. Rhode Island has a statutory responsibility to conserve, enhance, and properly utilize the State's natural resources. R.I. Gen. Laws § 10-20-1; *see also* R.I. Const. art. I, § 17.

57. Due to its coastal wetlands and woodlands, a high density of migratory bird species stop or overwinter in Rhode Island during migration to and from the Coastal Plain. Whimbrels, horned grebes, American golden-plovers, semipalmated sandpipers, and greater scaups are among the species that frequent the Coastal Plain and have been documented to feed and rest in Rhode Island while migrating further south. With 384 miles of shoreline and five national wildlife refuges in the state, Rhode Island is a popular birding destination. In 2011, 308,000 bird and wildlife watchers spent $200 million in Rhode Island undertaking this activity.

58. Plaintiff STATE OF VERMONT is a sovereign state in the United States of America. The State of Vermont brings this action through Attorney General Thomas J. Donovan, Jr. The Attorney General is authorized to represent the state in civil suits

involving the state's interests, when, in his judgment, the interests of the state so require. Vt. Stat. Ann. tit. 3 ch. 7.

59. Vermont has ownership, jurisdiction and control of all wildlife of the state as trustee for the state's citizens. Vt. Stat. Ann. tit. 10 § 4081(a)(1). Vermont has an interest in protecting wildlife, including birds that migrate through Vermont on their way to or from breeding grounds on the Coastal Plain, from harm both within and outside the state. Such migratory birds include the American golden-plover, snow bunting, and whimbrel. According to data for 2011, Vermont led the nation in the percentage of residents participating in bird watching (39%), and residents and visitors spent $289 million on birdwatching and other wildlife viewing in the state.

B. Defendants

60. Defendant David Bernhardt is Secretary of the Interior (Interior) and is sued in his official capacity. Secretary Bernhardt is responsible for implementing and fulfilling the duties of Interior, including managing all aspects of the Leasing Program; managing implementation of the Refuge Administration Act, relevant portions of ANILCA, and Section 20001 of the Tax Act; and bears responsibility, in whole or in part, for the acts complained of in this Complaint. Secretary Bernhardt signed the challenged Record of Decision.

61. Defendant Interior is a federal agency and oversees BLM and bears responsibility, in whole or in part, for the acts complained of in this Complaint.

62. Defendant BLM is a federal agency within Interior that bears responsibility, in whole or in part, for the acts complained of in this Complaint. Defendant BLM issued the challenged Record of Decision and FEIS.

IV. BACKGROUND

A. Protection of the Arctic National Wildlife Refuge

63. The federal government first protected the area now known as the Arctic National Wildlife Refuge in 1960 when the Secretary of the Interior established the Arctic National Wildlife Range. Public Land Order 2214, at 1 (Dec. 6, 1960) (PLO 2214).

64. Congress solidified and expanded these protections by passing ANILCA in 1980, which created the Arctic Refuge by adding 9.16 million acres of land to the existing 8.9 million-acre Arctic National Wildlife Range. ANILCA § 303(2)(A).

65. The Coastal Plain, which was a part of the original Range, is the most biologically productive part of the Arctic Refuge. The unique terrain of the Coastal Plain is comprised of mostly water or wetland and, due to the area's undisturbed nature, its wetland function and structure remain intact.

66. Along with caribou, polar bears, and other wildlife, more than 156 migratory bird species depend on the Coastal Plain's unique ecosystem. Birds migrate from the Arctic Refuge, particularly from the Coastal Plain, to six continents and through all 50 states.

67. Because of its undisturbed and unique ecosystem, the Arctic Refuge and its Coastal Plain have long-served as an important resource for scientific research, such as the study of migratory birds, within the National Wildlife Refuge System (Refuge System).

68. The Arctic Refuge also plays an important role in the United States' satisfaction of its international treaty obligations, including treaty obligations related to the protection of migratory birds.

69. Management of the Arctic Refuge is governed by ANILCA and the Refuge Administration Act.

70. The Refuge Administration Act applies to all national wildlife refuges and directs the Secretary of the Interior "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." 16 U.S.C. § 668dd(a)(2).

71. The Refuge Administration Act directs the Secretary to, among other things:

> (A) provide for the conservation of fish, wildlife, and plants and their habitats within the [Refuge] System;
>
> (B) ensure that the biological integrity, diversity, and environmental health of the [Refuge] System are maintained for the benefit of present and future generations of Americans;
>
> (C) plan and direct the continued growth of the [Refuge] System in a manner that is best designed to accomplish the mission of the [Refuge] System, to contribute to the conservation of the ecosystems of the United States, [and] to complement efforts of States and other Federal agencies to conserve fish and wildlife and their habitats, . . .; [and]
>
> (D) ensure that the mission of the [Refuge] System . . . and the purposes of each refuge are carried out . . . .

16 U.S.C. § 668dd(a)(4); *see also* 50 C.F.R. § 25.11(b).

72. Under the Refuge Administration Act, "each refuge shall be managed to fulfill the mission of the System as well as the specific purpose for which that refuge was established." 16 U.S.C. § 668dd(a)(3)(A).

73. The "purposes of the refuge" include purposes "specified in or derived from" laws or public land orders that established, authorized, or expanded the refuge. 16 U.S.C. § 668ee(10).

74. ANILCA identifies four purposes for establishing the Arctic Refuge and guiding its management:

(i) "to conserve fish and wildlife populations and habitats in their natural diversity," including "snow geese, peregrine falcons, and other migratory birds";

(ii) "to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats";

(iii) to provide opportunities for continued subsistence use by local residents; and

(iv) to ensure water quality and necessary water quantity within the refuge.

ANILCA § 303(2)(B).

75. These four ANILCA purposes add to the three original management purposes of the Arctic National Wildlife Range: to preserve "unique wildlife, wilderness, and recreational values." PLO 2214. These three Range purposes "remain in force and effect" for the Coastal Plain. ANILCA § 305.

76. ANILCA contains special provisions concerning the Coastal Plain. ANILCA § 1002 (codified at 16 U.S.C. § 3142). Recognizing the potential interest in oil and gas exploration and development on the Coastal Plain, Section 1002 requires "a comprehensive and continuing inventory and assessment of the fish and wildlife

resources of the coastal plain," including migratory birds, and directs Interior to study the potential impacts of oil and gas development on wildlife and habitats. ANILCA § 1002(a), (c).

77. By requiring such information, Congress sought to ensure that any oil and gas activity authorized within the Coastal Plain "avoid[] significant adverse effects on the fish and wildlife and other resources" of the region. *Id.* at § 1002(a).

78. Notwithstanding Section 1002, Section 1003 of ANILCA prohibited production of oil and gas from the Arctic Refuge and provided that "no leasing or other development leading to production of oil and gas from the range shall be undertaken until authorized by an Act of Congress." *Id.* at § 1003 (codified at 16 U.S.C. § 3143).

B. Congressional Directive to Develop a Limited Oil and Gas Program on the Coastal Plain

79. In December 2017, President Trump signed into law the Tax Act. A rider to the Tax Act includes several provisions about the management of the Coastal Plain. First, the Tax Act amends ANILCA to include providing for a limited oil and gas program on the Coastal Plain. Tax Act § 20001. Second, the Tax Act excludes the Coastal Plain from ANILCA's prohibition on oil and gas production. *Id*. § 20001(b)(1). Third, the Tax Act directs the Secretary of the Interior, through BLM, to "establish and administer a competitive program for the leasing, development, production, and transportation of oil and gas in and from the Coastal Plain." *Id*. § 20001(b)(2).

80. The Tax Act places parameters on the leasing program, directing BLM to hold two lease sales offering 400,000 acres in each lease sale within four and seven years of the date of enactment and to limit surface development to 2,000 surface acres of federal land on the Coastal Plain. *Id*. § 20001(c).

81. The Tax Act does not otherwise alter the framework of protections for the Arctic Refuge. Rather, the legislative history accompanying the Tax Act demonstrates that Congress intended environmental protection to remain a priority of Coastal Plain management.

C. Fossil Fuels and Climate Change Impacts

82. Oil and gas production from the Coastal Plain, as contemplated by the Leasing Program, will contribute to greenhouse gas emissions that cause climate change.

83. In a 2018 report, the Intergovernmental Panel on Climate Change (IPCC), an international scientific body of the United Nations, emphasized that climate change already is causing devastating impacts, including more frequent and extreme severe weather events, rising sea levels, and diminishing Arctic sea ice. Fossil fuel combustion, including oil and gas emissions, is a key driver of climate change.

84. The 2018 IPCC Report determined with a high degree of scientific confidence that if the current pace of greenhouse gas emissions continues, warming will reach 1.5 degrees Celsius above pre-industrial levels between 2030 and 2052.

85. Defendant Interior and the dozen other federal agencies that comprise the U.S. Global Change Research Program warned in the November 2018, Fourth National Climate Assessment that without substantial and sustained efforts to reduce greenhouse gas emissions, climate change will increasingly disrupt ecosystems; threaten human health, safety, and quality of life; damage infrastructure; and hinder economic growth throughout the United States, including in Plaintiffs' states.

86. Multiple studies repeatedly have demonstrated that a substantial portion of the world's recoverable fossil fuel reserves, such as those located in the Coastal Plain, must remain unburned in order to avert the most catastrophic impacts of climate change.

87. Over the past ten years, these unburnable reserve estimates have steadily increased. The 2018 IPCC report warned that to have only a 50% chance of avoiding the most devastating consequences of climate change resulting from global warming above the 1.5-degree Celsius level, about 80% of recoverable fossil fuel reserves must remain unburned.

88. Heeding these warnings, State Plaintiffs, businesses, and individuals are working to decrease reliance on fossil fuels and transition to cleaner technology. These efforts notwithstanding, State Plaintiffs already are experiencing devastating and increasingly severe climate impacts.

89. Along the coasts of Plaintiffs Washington, Massachusetts, California, Connecticut, Delaware, Maine, Maryland, New York, New Jersey, Oregon, and Rhode

Island, ocean acidification through the ocean's absorption of excess carbon dioxide in the atmosphere and warming water temperatures threaten natural resources and vital fisheries, including oysters, cod, lobster, and other marine life that play vital roles in the states' economy and culture. For example, without greenhouse gas mitigation, ocean acidification along Washington's coast is expected to cause a 34% decline in shellfish survival by 2100.

90. The rise of sea levels from melting ice sheets and glaciers and thermal expansion has impacted coastal and marine waters along over 18,000 shoreline miles of Plaintiffs Washington, Massachusetts, California, Connecticut, Delaware, Maine, Maryland, New Jersey, New York, Oregon, and Rhode Island. Sea level rise has led to more frequent tidal inundation, and when combined with more intense coastal storms, storm surges and severe flooding that cause significant damage to state properties, tourism, public infrastructure, private homes, businesses, and wildlife habitat, and increasing demands for emergency services. Impacted areas include a diverse array of coastal ecosystems (*e.g.*, sandy beaches, islands, estuaries, and salt marshes) that offer immense recreational, cultural, and aesthetic value to the residents of and visitors to coastal State Plaintiffs, while also serving important ecological functions.

91. Rising sea levels, coupled with intensifying weather events, also threaten State Plaintiffs' migratory birds and their habitat. Coastal wetlands provide an important stopover for millions of migratory birds. With intensifying storms and rising sea levels,

tidal flats and marshes could become open water, jeopardizing the survival of the migratory birds that depend on the tidal flats and marshes to feed and nest.

92. Specific impacts from sea level rise to State Plaintiffs' resources include:

92.1 Boston, the largest city in Massachusetts, could experience cumulative damage to buildings, building contents, and associated emergency costs as high as $94 billion between 2000 and 2100, depending on the sea level rise scenario and the extent of adaptive and preventative actions in place.

92.2 Sea level rise in Delaware threatens property assessed at approximately $1.5 billion and will harm coastal ecosystems that offer recreational, cultural, ecological, and aesthetic value to the residents of and visitors to the state. Delaware's 2012 Sea Level Rise Vulnerability Assessment determined that 8 to 11% of the state's land area could be inundated by sea level rise of 0.5 to 1.5 meters.

92.3 Maryland is projected to experience between 2.1 and 5.7 feet of sea level rise over the next century, leading to shoreline erosion, coastal flooding, storm surges, inundation, and saltwater intrusion into groundwater supplies and adversely impacting tourism and the Port of Baltimore.

92.4 Sea level rise in New York will not only directly increase the risks to lives and property in the state from future storms, but also threaten coastal wetlands, which provide important species habitat and protect adjacent communities. Swiss Re, a reinsurance and insurance company, has estimated that expected annual economic losses

in New York City alone from rising sea levels and more intense storms may increase to $4.4 billion by the 2050s.

92.5 Rhode Island has experienced over ten inches of sea level rise since 1930, averaging over an inch per decade. The mean annual rate of sea level rise has increased in recent decades and will continue to rise significantly. According to the National Oceanic and Atmospheric Administration, Rhode Island could experience nine feet of seal level rise by 2100, along with substantial increase in the frequency of tidal flooding. Further, Rhode Island's topography, geography, and land use patterns make it particularly susceptible to injuries from seal level rise. Particularly, Rhode Island has substantial public assets in 21 coastal municipalities along its nearly 400 miles of coastline and 20 Rhode Island municipalities have acreage lying below the floodplain.

93. The rise in extreme weather events have caused drought, flooding, wildfires, and other catastrophic natural disasters leading to significant losses for State Plaintiffs, including:

93.1 Extreme weather on the East Coast includes hurricanes, coastal storms, heavy downpours, and extreme heat that are increasing in frequency and intensity. In Connecticut, where the annual mean temperature rose by approximately three degrees Fahrenheit since 1895, warmer weather is contributing to a rise in average annual precipitation that will increase the frequency of heavy downpours. In New York, Hurricane Sandy caused an estimated $32 billion in losses and over 50 deaths in the state.

Lake Ontario reached record high-water levels in 2017 and 2019 causing significant damage to properties in New York's lakefront communities. In New Jersey, Sandy's severe winds and coastal flooding cost the state an estimated $11.7 billion in lost domestic product, including $950 million in tourism losses. Hurricane Irene caused estimated damages of up to $1 billion in New York and then dumped approximately 11 inches of rain on Vermont, temporarily or permanently displacing more than 1,400 households and causing $733 million in damage, including damage to more than 500 miles of state highway and 480 bridges. Since 1960, average annual precipitation in Vermont has increased by 5.9 inches and increasingly frequent heavy rainstorms threaten to flood communities in Vermont's many narrow river valleys. Over the past 80 years, Rhode Island has experienced a doubling of the frequency of flooding, an increase in the magnitude of flood events and has had more extreme precipitation events between 2005 and 2014 than any prior decade in the state's history. In just Providence, Rhode Island, average annual precipitation has increased by 0.4 inches per decade since 1895 and intense rainfall events have increased 71% between 1958 and 2000.

93.2 Extreme weather in the Midwest includes flooding, drought, and whipsawing water levels on the Great Lakes. In 2011, 15 inches of rain fell in northwestern Illinois over just 12 hours, killing one person and damaging infrastructure. In spring 2019, flooding in Illinois delayed crop planting, causing the U.S. Department of Agriculture to declare an agricultural disaster in every county in Illinois. Predictions

indicate that warmer weather and altered rain patterns will reduce crop yield by 15% within two decades and up to 73% by the end of the century, making farming particularly vulnerable to extreme precipitation caused by climate change. Since 2004, Minnesota has experienced three 1,000-year floods and an increase in intense weather events including hailstorms, tornadoes and droughts. In 2007, several Minnesota counties received drought designation, while others experienced flood disasters—an occurrence that repeated itself in 2012 when 11 counties declared flood emergencies while 55 received drought designations. In 2019, Lake Michigan broke its 33-year-old high-water record; in 2013, it reached an all-time low. Rapidly swinging water levels harm commercial shipping, recreational boaters, and beach-goers—low water forces freighters to forgo cargo and high water erodes beaches.

93.3 In the West, extreme weather in Plaintiffs' states threaten to devastate wildlife populations and agricultural industries. For example, rising stream temperatures and lower summer stream flows from reduced snow pack continue to reduce the quality and quantity of salmon habitat in western states, particularly California, Oregon, and Washington. In 2015, Oregon experienced the warmest year since recordkeeping began in 1895. The heat resulted in record low snowpack across the state, a two-third reduction of normal irrigation water for farmers in eastern Oregon's Treasure Valley, and the loss of more than half of spring spawning salmon in the Columbia River.

94. Warmer temperatures also contribute to increased risks of disease and health impacts. Changes in vegetation and the rise in deer populations have contributed to an increased risk of West Nile Virus in Connecticut and the spread and prevalence of Lyme disease in Massachusetts, Connecticut, Minnesota, Rhode Island, and Vermont. Heat-related deaths in New York City have been projected to increase if actions are not taken to reduce greenhouse gas emissions and lessen temperature increases. In Michigan, heat-related illnesses, waterborne diseases, and vector-borne diseases are on the rise. In California, increased hospitalizations for multiple diseases, including cardiovascular disease, ischemic stroke, pneumonia, and heat stroke, are associated with increases in same-day temperature. California bears a substantial portion of the costs of these medical conditions as a result of its financial responsibility for Medi-Cal and Medicare payments. Increased forest fire activity in western states like California, Oregon, and Washington, leads to an increase in unhealthy air days, impacting public health.

95. Like State Plaintiffs, the Arctic ecosystem, including the Coastal Plain, is rapidly changing due to climate change. Accelerated melting of multiyear sea ice, increased boreal wildfires, reduction of terrestrial snow cover, and permafrost degradation are stark examples of the rapid Arctic-wide response to global warming.

96. Annual average near-surface air temperatures across Alaska and the Arctic have increased over the last 50 years at a rate more than twice as fast as the global

average temperature. Increased temperatures on Alaska's North Slope contribute to thawing permafrost that releases carbon dioxide and methane that amplifies warming.

97. Yet, despite the overwhelming and increasingly harmful impacts of climate change in the United States and around the world, Defendants asserted in the FEIS that "[T]here is not a climate crisis." FEIS S-686.

98. The 2018 IPCC Report gravely warns that an increase in global temperatures of 1.5 degrees Celsius above preindustrial levels will significantly increase risks for human health, food security, biodiversity, national security, and global economies. Yet, the Defendants summarily dismissed this conclusion as "rel[ying] on global climate models that have grossly overestimated the amount of warming (based on actual observations) from a given amount of GHG emissions . . . ." FEIS S-569.

99. Defendants further trivialized the importance of reducing U.S. emissions, stating, "Restricting GHG emissions, especially in just the [United States], which now represents a small and shrinking portion of global emissions, would not have a measurable effect on climate change globally or regionally in Alaska." FEIS S-581.

100. In fact, the United States remains the second-largest contributor of carbon emissions in the world. Recent reports affirm that immediate and substantial global greenhouse gas emission reductions are essential to limiting the most harmful impacts of climate change in the United States and across the globe.

D. The Leasing Program FEIS and Record of Decision

1. NEPA's Requirements

101. Before authorizing the Leasing Program, Defendants must comply with NEPA's environmental review requirements.

102. NEPA declares a national policy to "use all practicable means and measures" to "create and maintain conditions in which man and nature can exist in productive harmony." 42 U.S.C. § 4331(a).

103. The objectives of NEPA are realized through a set of "action-forcing" procedures that require that agencies take a "'hard look' at environmental consequences." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989).

104. A federal agency must ensure that its impacts analysis "inform[s] the public that it has indeed considered environmental concerns in its decisionmaking process." *Pit River Tribe v. U.S. Forest Serv.*, 469 F.3d 768, 781 (9th Cir. 2006) (quoting *Earth Island Inst. v. U.S. Forest Serv.,* 442 F.3d 1147, 1153–54 (9th Cir. 2006)).

105. The Council on Environmental Quality (CEQ) promulgated rules implementing NEPA, which apply to all federal agencies. 40 C.F.R. pt. 1500.[1] Interior also promulgated rules governing its NEPA implementation. 43 C.F.R. pt. 46.

[1] CEQ recently issued new regulations implementing NEPA that take effect September 14, 2020. Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act, 85 Fed. Reg. 43,304 (July 16, 2020) (to be codified at 40 C.F.R. pt. 1500). CEQ's prior regulations, promulgated in 1978 with minor amendments in 1986 and 2005, govern Defendants' Record of Decision and FEIS. All regulatory references in this complaint are to the 1978 regulations, as amended.

106. NEPA requires federal agencies to prepare an environmental impact statement (EIS) for all "major federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332.

107. "Major federal actions" include "new and continuing activities" with "effects that may be major and which are potentially subject to Federal control and responsibility." 40 C.F.R. § 1508.18.

108. An EIS must "provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." *Id.* § 1502.1.

109. An EIS must discuss, among other things: the environmental impact of the proposed federal action, any adverse and unavoidable environmental effects, alternatives to the proposed action, and any irreversible and irretrievable commitments of resources involved in the proposed action. 42 U.S.C. § 4332.

110. An EIS's analysis of reasonable alternatives "is the heart of the environmental impact statement." 40 C.F.R. § 1502.14.

111. Agencies must rigorously explore and objectively evaluate all reasonable alternatives, including the alternative of taking no action, and must discuss the reasons for eliminating any alternatives rejected from detailed study. *Id*.

112. An EIS must state how alternatives considered will achieve the requirements of NEPA and "other environmental laws and policies." *Id*. § 1502.2.

113. NEPA's regulations require agencies to analyze both the direct impacts that an action will have on the environment, as well as the action's "reasonably foreseeable" indirect and cumulative impacts. *Id.* § 1508.8.

114. Direct impacts are caused by the action and occur at the same time and place as the action. *Id*. § 1508.8(a).

115. Indirect impacts are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." *Id*. § 1508.8(b).

116. Cumulative impacts are those impacts that result "from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions." *Id*. § 1508.7.

117. A legally adequate impact analysis requires the establishment of accurate baseline conditions to determine the effect the action will have on the environment. *Half Moon Bay Fisherman's Mktg. Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988).

118. If information that is essential for making a reasoned choice among alternatives is not available, an agency must obtain that information unless the costs of doing so would be exorbitant. 40 C.F.R. § 1502.22(a).

119. Agencies also have an obligation to consider in the EIS mitigation measures to avoid, minimize, rectify, reduce, eliminate, or compensate for environmental harms of agency action. *Id*. §§ 1502.16(h), 1508.20.

2. Defendants' FEIS and Record of Decision

120. On December 28, 2018, Defendants published a Notice of Availability of the Draft Environmental Impact Statement (DEIS). Interior, BLM, Notice of Availability of the Draft Environmental Impact Statement for the Coastal Plain Oil and Gas Leasing Program and Announcement of Public Subsistence-Related Hearings, 83 Fed. Reg. 67,337 (Dec. 28, 2018).

121. Nearly all State Plaintiffs submitted detailed comments on the DEIS, highlighting numerous inadequacies in Defendants' environmental review, including a deficient range of alternatives, a deficient analysis of greenhouse gas emissions and associated climate change impacts, and a deficient analysis of migratory bird impacts.

122. The vast majority of the more than one million public comments on the DEIS, including comments submitted by nearly all State Plaintiffs, opposed expansive leasing and development in the Coastal Plain.

123. Just six months after the comment period closed on the DEIS, Defendants noticed the availability of the FEIS in the Federal Register on September 25, 2019. Interior, BLM, Notice of Availability of the FEIS for the Coastal Plain Oil and Gas Leasing Program, Alaska, 84 Fed. Reg. 50,472 (Sept. 25, 2019).

124. Defendants issued the Record of Decision approving the Leasing Program on August 17, 2020.

125. The Record of Decision authorizes Alternative B, which will allow oil and gas leasing on the entire program area encompassing 1,563,500 acres of the Coastal Plain. As the Record of Decision notes, this expansive area will also be available for "future exploration, development, and transportation" resulting from the Leasing Program. Interior, BLM, Coastal Plain Oil and Gas Leasing Program Record of Decision 3 (August 2020) (ROD).

126. Alternative B has the most severe environmental impacts of all considered alternatives. It maximizes the acreage available for leasing, seismic exploration, development, and transportation and includes the fewest environmental protections. Alternative B has the greatest anticipated impacts on the delicate Coastal Plain ecosystem, including impacts to the area's wildlife (including migratory birds), habitat, subsistence values, and water resources.

127. The Record of Decision adopts the lease stipulations and required operating procedures considered in the FEIS. BLM may waive, exempt, or modify the lease stipulations and required operating procedures. Among other things, the lease stipulations and required operations procedures do not adequately protect the conservation purposes of the Arctic Refuge, including migratory birds.

128. Although the Record of Decision recognizes that the Tax Act "included a Coastal Plain oil and gas program as a refuge purpose on *equal footing* with the other refuge purposes," ROD 1 (emphasis added), the Record of Decision elevates the oil and gas program over the other refuge purposes stated in ANILCA.

129. The Record of Decision does not acknowledge the purposes identified in Public Land Order 2214.

130. The Record of Decision does not contain a determination that the Leasing Program authorized by Defendants is a compatible use of the Arctic Refuge or that the Leasing Program fulfills the eight refuge purposes. Instead, the Record of Decision states only that it took the ANILCA refuge purposes into account and that there will be some "potential impact" on those purposes. ROD 7–8.

131. The Record of Decision adopts an interpretation of the Tax Act's 2,000-acre surface development limit that is different than the FEIS's and allows for even greater disturbance of the Coastal Plain. Although the Record of Decision continues to interpret the surface acre limit as requiring Defendants to authorize 2,000 acres of surface development, Defendants assert for the first time in the Record of Decision that the surface development provision applies only to a narrow subset of facilities that are both "production and support" facilities. ROD 11–13. Under this new interpretation, many facilities (*e.g.*, airstrips, roads, and gravel mines) that BLM previously considered in the

FEIS to count toward the 2,000-acre surface disturbance limit may not count toward that limit under the authorized Leasing Program.

132. The Record of Decision further adopts an interpretation of the rights-of-way provision of the Tax Act that overrides the 2,000-acre surface development limit, stating that BLM must issue a right-of-way grant or necessary access authorizations.

133. The Record of Decision relies on the deficient FEIS, which, among other things, fails to consider an adequate range of alternatives, fails to assess adequately the greenhouse gas emissions and climate impacts of the Leasing Program, and fails to assess adequately migratory bird impacts of the Leasing Program.

a. Defendants' Deficient Range of Alternatives

134. The FEIS does not consider a reasonable range of alternatives.

135. The FEIS considers three action alternatives and a no-action alternative. Alternatives B and C authorize leases in the entire program area, covering 1,563,500 acres. Alternative D contains two sub-alternatives, D-1 and D-2. Alternative D-1 authorizes lease sales on 1,037,200 acres and Alternative D-2 authorizes lease sales on 800,000 acres.

136. In the purpose and need statement, Defendants stated that "[a]ll action alternatives were designed to meet Section 2001 of [the Tax Act] and to account for all purposes of the Arctic Refuge." FEIS ES-1. Defendants further stated that "[t]he alternatives analyze various terms and conditions (i.e., lease stipulations and required

operating procedures) to be applied to leases and associated oil and gas activities, to properly balance oil and gas development with protection of surface resources." *Id*.

137. Yet, instead of balancing development with surface resource protection, each action alternative unlawfully prioritizes oil and gas production above the conservation purposes of the Arctic Refuge.

138. Among other things, all of the action alternatives considered would allow 174 or more miles of gravel road construction *plus* extensive and harmful ice road construction, 212 or more miles of pipeline, nearly 300 acres of gravel pits and stockpiles, and seismic activity across much of the Coastal Plain. These action alternatives permit, and in fact exceed, the maximum surface infrastructure limits Congress set in the Tax Act.

139. Each action alternative threatens significant and long-lasting harm to the unique ecology, wildlife, wilderness, and recreational values of the Arctic Refuge, including to the migratory bird populations of great importance to State Plaintiffs and to the Arctic Refuge itself.

140. In addition, each action alternative threatens to worsen greenhouse gas emissions and associated climate impacts and to alter forever the hydrology and habitat of the Coastal Plain.

141. None of the action alternatives considered in the FEIS would restrict surface acre disturbance, limit ice road construction, delay or phase leasing, limit seismic

activity, mitigate greenhouse gas emissions, effectively protect migratory bird habitat, effectively minimize or mitigate adverse environmental impacts, or otherwise fulfill the conservation purposes of the Arctic Refuge to the extent consistent with the Tax Act.

142. An alternative that includes some or all of these components to better protect the Coastal Plain from significant environmental harm and advance the conservation purposes of the Arctic Refuge, to the extent consistent with the Tax Act, is a reasonable alternative consistent with the purpose and need of the proposed Leasing Program that Defendants should have considered in the FEIS.

143. Because Defendants did not consider this reasonable alternative, Defendants' lacked critical information about which areas within the Coastal Plain to make available for oil and gas leasing, which lease stipulations and required operating procedures to adopt, and how to avoid, minimize, and mitigate adverse impacts from the Leasing Program.

b. Defendants' Deficient Analysis of Greenhouse Gas Emissions and Climate Impacts

144. The FEIS analysis of greenhouse gas emissions and climate impacts from the Leasing Program violates NEPA's "hard look" mandate and undermines Defendants' ability to make reasoned decisions by both underestimating the potential greenhouse gas emissions from Coastal Plain development and failing to meaningfully analyze the climate impacts associated with such development.

(1) Defendants' Deficient Analysis of Greenhouse Gas Emissions

145. Although the FEIS acknowledges that Coastal Plain production will cause both direct and indirect greenhouse gas emissions, it drastically underestimates the Leasing Program's indirect greenhouse gas emissions.

146. The FEIS assumes that production from the Coastal Plain will be between 1.5 billion barrels of oil and zero cubic feet of natural gas at the low end and 10.6 billion barrels of oil plus 2.5 trillion cubic feet of natural gas at the high end.

147. The FEIS uses these production levels to evaluate indirect greenhouse gas emissions from the Leasing Program.

148. The FEIS also assumes that approximately 96% of Coastal Plain production will replace other domestic oil and gas production that would be developed in the absence of the Leasing Program, and, thus, the FEIS calculates that Coastal Plain production will increase U.S. demand by just 3.4 to 3.9%.

149. The FEIS recognizes that oil is a global commodity, but does not model energy source substitutions that would globally occur in the absence of Coastal Plain development. Instead, the FEIS models only domestic substitutions to determine the increase in demand resulting from Coastal Plain development.

150. Based on this limited analysis, and without considering oil and gas consumption globally, the FEIS projects that Coastal Plain development and production

will increase net annual U.S. greenhouse gas emissions by less than 0.10% and will increase net annual global emissions by a fraction of that amount.

151. The FEIS relies on these projected low percentage increases in U.S. and global emissions to dismiss concerns about potential climate change impacts from Coastal Plain production.

152. This analysis underestimates potential greenhouse gas emissions by not fully incorporating global effects from Coastal Plain production and unreasonably assuming that 96% of Coastal Plain oil and gas production will replace other U.S. fuels—mostly oil, natural gas, and coal—that would otherwise be developed.

153. Development of Coastal Plain oil and gas is particularly expensive because of its remote location, environmental conditions, and lack of existing pipelines, processing centers, and other infrastructure.

154. Even assuming that Defendants account for this, Defendants do not justify their assumption that Coastal Plain oil and gas once produced will compete with and ultimately displace oil and gas from cheaper domestic projects, let alone analyze how it will interact with global markets.

155. Given the high cost of Coastal Plain production, the FEIS likely overstates the potential for Coastal Plain oil and gas to displace production from more economical projects elsewhere within the United States. If Coastal Plain oil and gas production, even accounting for its relative high cost, significantly displaces U.S. consumption, it is

reasonable that such Coastal Plain production would also be consumed by global energy markets, thereby increasing greenhouse gas emissions beyond BLM's projections. However, BLM does not consider these impacts, even assuming that its other projections are reasonable, which they are not.

156. If Coastal Plain oil and gas is produced but does not displace production from these other domestic projects, then Coastal Plain production will contribute to greater supply and demand and greater greenhouse gas emissions in the U.S. and globally. As a result, contrary to the Record of Decision's assertions that the FEIS overstates environmental impacts, the FEIS likely understates the greenhouse gas emissions and climate change impacts of the Leasing Program in violation of NEPA.

157. The FEIS also does not reconcile or rationally justify its conflicting assumptions that Coastal Plain development will displace other domestic oil and gas production but also only add jobs (and not displace) in the United States. In other words, the FEIS assumes, without justification, that the jobs created by Coastal Plain development and production would not be offset by jobs lost through the displacement of development elsewhere in the United States.

(2) Defendants' Deficient Analysis of Emission Costs

158. The FEIS greenhouse gas emission analysis further violates NEPA because it quantifies the economic benefits of Coastal Plain development without quantifying the

costs of development, particularly costs from greenhouse gas emissions and associated climate change.

159. NEPA requires that where an agency quantifies the benefits of a proposed action, the agency must also quantify the costs, including the social costs associated with greenhouse gas emissions, to ensure that the agency accurately analyzes the environmental consequences of its proposed action.

160. The social cost of carbon is a federally developed tool to assist agencies in evaluating the social benefits of reducing carbon dioxide emissions when analyzing the costs and benefits of agency action.

161. Defendants could have applied the social cost of carbon or another available metric to calculate the cost of development in the FEIS but they failed to do so. As a result, their analysis is deficient under NEPA.

(3) Defendants' Deficient Methane Emissions Analysis

162. The FEIS also fails to meaningfully analyze climate change impacts from methane emissions.

163. Methane is a potent greenhouse gas that is over 30 times more powerful than carbon dioxide in its ability to trap heat in the atmosphere over a 100-year time frame, and 86 times more potent over a 20-year time frame.

164. Methane, thus, has significant short-term climate change impacts.

165. Yet, in the FEIS, Defendants improperly analyzed methane emissions and their climate impacts, further contributing to the deficient analysis of greenhouse gas emissions and climate impacts in the FEIS.

(4) Defendants' Deficient Cumulative Impacts Analysis

166. NEPA obligates Defendants to meaningfully consider in the FEIS the cumulative impacts of greenhouse gas emissions associated with the leases on climate change. *See* 42 U.S.C. § 4332; 40 C.F.R. § 1508.7.

167. Defendants failed to meet this NEPA obligation, devoting a mere paragraph to its analysis of the cumulative climate impacts of the proposed Leasing Program.

c. Defendants' Inadequate Analysis of Migratory Bird Impacts

168. The FEIS analysis of the Leasing Program's impact on migratory birds in the Coastal Plain violates NEPA's "hard look" mandate and undermines Defendants' ability to make reasoned decisions about programmatic measures, including but not limited to lease stipulations, required operating procedures, and pre-leasing seismic activities.

169. The FEIS analysis is incomplete, unsupported by current data or evidence, and cursory, thereby significantly impairing Defendants' ability to make reasoned decisions.

170. Following Congress' authorization of the Leasing Program, lead experts from BLM, FWS, and other agencies identified actions that would be necessary to implement successfully the Leasing Program, including conducting studies to obtain the

best available science and gathering baseline data necessary to assess potential impacts of development.

171. The FEIS irrationally dismisses its own experts' opinions about both the sufficiency of available information, the necessity to gather data as quickly as possible, and the necessity for the information to make programmatic leasing decisions.

172. Defendants cannot fulfill their duty to take a "hard look" at potential impacts of the Leasing Program without vital baseline data about migratory birds because there is no way to know what effect the Leasing Program will have on the birds without it.

173. The absence of such critical data precludes Defendants from making reasoned choices about impacts of pre-leasing seismic activity, which land to lease, and how to define conservation and management priorities, including what impacts to mitigate, whether mitigation proposed would be adequate to offset impacts, or why mitigation measures were not adopted. The contradiction and inconsistencies between expert reports, studies, and opinions and the FEIS and subsequent Record of Decision are arbitrary and irrational.

174. Without the necessary data to meaningfully analyze the Leasing Program's impact on migratory birds, Defendants' analysis relies on generic, broad, and unsupported statements.

175. When the FEIS does cite studies to support its conclusory statements, it improperly relies on stale data, some of which is more than 40 years old.

176. Updated geographic, population, and impact data are essential to make reasoned programmatic decisions for the Leasing Program, specifically those determining where and under what terms and conditions leasing will occur; those decisions cannot be remedied later with to-be-determined site-specific analysis.

177. Moreover, because the Record of Decision permits substantially more surface disturbance than the FEIS contemplates, the Record of Decision renders the FEIS's incomplete analysis of migratory birds impacts even more deficient.

178. In addition, the deficient analysis of impacts on migratory birds undermines Defendants' ability to comply with their legal obligations under ANILCA and the Refuge Administration Act to manage the Arctic Refuge consistent with all of its purposes.

V. THE LEASING PROGRAM WILL HARM STATE PLAINTIFFS

179. State Plaintiffs have concrete and particularized interests in preventing harm to their natural resources, including public lands, waterways, and migratory birds that State Plaintiffs own and hold in both proprietary and regulatory capacities and in trust by the states for the benefit of the people of each state. These interests include protecting migratory birds that frequent the Coastal Plain and State Plaintiffs and reducing climate change impacts from fossil fuel development.

180. State Plaintiffs suffer concrete and redressable injury to these interests as a consequence of Defendants' failure to develop a lawful and adequate Record of Decision and FEIS that satisfy NEPA, properly interpret the Tax Act, and act in a manner consistent with all purposes of the Arctic Refuge.

181. Defendants' actions harm State Plaintiffs' sovereign and proprietary interests. State Plaintiffs devote considerable resources and efforts to fulfill their trustee duties and protect their sovereign and proprietary interests in their natural resources. *See supra* III. Parties; IV.C. Fossil Fuels and Climate Change Impacts.

182. However, because nature does not recognize state borders, environmental harms often have cross-border impacts. As discussed above, climate change impacts resulting from accumulation of greenhouse gas emissions have harmed and are increasingly harming state sovereign lands and coastal areas, state natural resources, state infrastructure, and the health and safety of state residents. These impacts result in economic losses for State Plaintiffs and their residents and businesses. Intergovernmental bodies like the Flyway Councils recognize the reality of cross-border impacts in their efforts for coordinated migratory bird conservation. But whether State Plaintiffs act alone or in collaboration with public agencies, they cannot make informed and reasoned regulatory decisions to protect their natural resources if they do not have accurate or meaningful information about the environmental impacts of actions taken outside of their states.

183. Defendants acknowledged in the FEIS that the Leasing Program will impact climate change and migratory birds, and those impacts will reach State Plaintiffs. The Record of Decision also recognizes that the Leasing Program "will have transboundary impacts" on migratory birds and other wildlife. ROD 16. However, without an adequate Record of Decision and FEIS, State Plaintiffs can neither mitigate these environmental impacts through their independent regulatory authorities nor protect their sovereign and proprietary interests. This inability to prevent these harms is especially concerning because the environmental impacts of the Leasing Program may be particularly devastating and lasting due to the already harsh and rapidly changing climate of the Arctic Refuge. Moreover, accelerated climate change on the Coastal Plain directly impacts State Plaintiffs because atmospheric circulation patterns connect the climates of the Arctic and the contiguous United States.

184. State Plaintiffs have a particularly pronounced interest in the health of migratory birds on the Coastal Plain given the documented and staggering net population loss of nearly three billion birds in North America since 1970. Given the immense density (millions) and diversity (at least 156 species) of migratory birds on the Coastal Plain, the area's ecological importance cannot be overstated. The area is vital for conservation and population management of thousands of birds that fly 3,000 miles or more annually from breeding, molting, and resting areas in the Coastal Plain to lower-48 states, including Plaintiffs' states where the bird and wildlife watchers collectively spent

over $20 billion in 2011, generating an economic impact—including direct, indirect, and induced effects—of approximately $37 billion. The Leasing Program, including its authorization of expansive surface development, will forever alter the fragile landscape of the Coastal Plain, imperiling migratory birds and their habitat.

185. State Plaintiffs have also expended considerable resources and efforts to significantly reduce greenhouse gas emissions in their states through increased use of renewable energy sources and promoting electric vehicles. Any greenhouse gas emissions from the Leasing Program's will offset and undermine these efforts and will harm State Plaintiffs' sovereign and proprietary interests. *See also supra* IV.C. Fossil Fuel and Climate Change Impacts.

186. Defendants' actions also harm State Plaintiffs procedural interests. Nearly all State Plaintiffs participated in the administrative review process by submitting comments on the DEIS and expressed their interest in Defendants' legal compliance, including environmental review obligations under NEPA. Defendants' failure to comply with NEPA in developing the challenged FEIS and Record of Decision and Defendants' failure to reach a reasoned decision that complies with the framework of laws protecting the Arctic Refuge harms State Plaintiffs' procedural interests. Lease sales and authorizations for oil and gas activities, including pre-leasing seismic exploration that could occur across the entire leasing program area, will irreparably degrade the Arctic

Refuge, harm wildlife and their habitat, emit greenhouse gases, and harm State Plaintiffs' concrete sovereign and proprietary interests in the resources affected by these impacts.

187. A court judgment vacating the Record of Decision and the Final EIS will redress the harms to State Plaintiffs by requiring Defendants to comply with its statutory obligations under the Refuge Administration Act, ANILCA, the APA, NEPA, and the Tax Act.

VI. FIRST CAUSE OF ACTION
(Violation of Refuge Administration Act, ANILCA, and APA)

188. State Plaintiffs incorporate all preceding paragraphs by reference.

189. The APA, which establishes the requirements of agency decision making, applies to review of the Record of Decision, FEIS, and any other final agency action concerning the Arctic Refuge. 5 U.S.C. §§ 701–06.

190. Under the APA, a "reviewing court shall . . . hold unlawful and set aside" agency action found to be "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law," or "without observance of procedure required by law." 5 U.S.C. § 706.

191. Agency actions are "arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Motor Vehicle Mfrs. Ass'n, Inc. v.*

State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983), *cited in Greater Yellowstone Coal., Inc. v. Servheen*, 665 F.3d 1015, 1023 (9th Cir. 2011).

192. The Refuge Administration Act and ANILCA govern administration of the Arctic Refuge.

193. Under ANILCA, the Secretary must administer the Arctic Refuge "in accordance with the laws governing the administration of units of the National Wildlife Refuge System, and this Act." ANILCA § 304(a). ANILCA, Public Land Order 2214, and the Tax Act identify the Arctic Refuge's purposes.

194. ANILCA identifies four conservation purposes for the Arctic Refuge: (1) conservation of wildlife and their habitat (including migratory birds); (2) fulfillment of international treaty obligations with respect to wildlife and their habitats; (3) protection of water quality and quantity; and (4) opportunity for continued subsistence uses by local residents. ANILCA § 303(2)(B).

195. The ANILCA purposes built on the original conservation purposes the Secretary identified for creating the Arctic Range to preserve unique wildlife, wilderness, and recreational values. PLO 2214.

196. The Tax Act added "to provide for an oil and gas program on the Coastal Plain" to the existing conservation purposes for the Arctic Refuge. Tax Act § 20001(b)(2)(B).

197. The Refuge Administration Act provides that "the Secretary shall not initiate or permit a new use of a refuge or expand, renew, or extend an existing use of a refuge, unless the Secretary has determined that the use is a compatible use." 16 U.S.C. § 668dd(d)(3)(A)(i).

198. ANILCA provides that oil and gas leasing is a "use" that requires compatibility with the Refuge purposes. ANILCA § 304(b); *see also* 50 C.F.R. § 25.12.

199. A use is a "compatible use" if it will not "materially interfere with or detract from the fulfillment of the mission of the [Refuge] System or the purposes of the refuge." 16 U.S.C. § 668ee(1).

200. Compatibility determinations must be in writing and based on "sound professional judgment." 50 C.F.R. § 25.12.

201. "Sound professional judgment" means a decision "that is consistent with principles of sound fish and wildlife management and administration, available science and resources, and adherence to the requirements of [the Refuge Administration] Act and other applicable laws." 16 U.S.C. § 668ee(3).

202. The Leasing Program is a new use of the Arctic Refuge that requires a compatibility determination. Defendant Bernhardt did not make such a determination in violation of the Refuge Administration Act. 16 U.S.C. §§ 668dd–68ee.

203. The Refuge Administration Act also requires that the Secretary manage each refuge "to fulfill the mission" of the Refuge System, "as well as the specific purposes for which that refuge was established." *Id*. § 668dd(a)(3)(A).

204. The Refuge Administration Act further directs the Secretary to, among other things, provide for the conservation of fish, wildlife, and their habitats, ensure the biological integrity and health of the Refuge System, contribute to the conservation of ecosystems in the United States, and ensure the mission of the Refuge System and the purposes of each refuge are carried out. *See id*. § 668dd(a)(4).

205. The Record of Decision authorizes a leasing program that materially interferes with or detracts from the fulfillment of the mission of the Refuge System and purposes of the Arctic Refuge because it unlawfully prioritizes oil and gas development above the conservation purposes of the Refuge System and the Arctic Refuge. The Secretary thus violated his obligations under the Refuge Administration Act, 16 U.S.C. §§ 668dd–668ee, and ANILCA, § 303(2)(B), as well as the rational decision making mandates of the APA, 5 U.S.C. § 706.

206. To the extent the Secretary made a compatibility determination or considered fulfillment of the Refuge System mission and the Arctic Refuge purposes, the Secretary failed to provide a rational explanation to support either a compatibility determination or a decision that the Leasing Program will fulfill the mission of the Refuge System or the Arctic Refuge purposes. The Secretary's authorization of the

Leasing Program is thus arbitrary, capricious, an abuse of discretion, and otherwise not in accordance with law in violation of the APA. 5 U.S.C. § 706.

VII. SECOND CAUSE OF ACTION
(Violation of NEPA and the APA: Failure to Consider a Reasonable Range of Alternatives)

207. State Plaintiffs incorporate all preceding paragraphs by reference.

208. Courts review claims challenging NEPA violations under the APA. *Pit River Tribe*, 469 F.3d at 778.

209. NEPA requires federal agencies to review the environmental impacts of major federal actions before the action occurs to ensure agencies make informed decisions based on sound science and public input. 42 U.S.C. § 4332.

210. As part of this environmental review, agencies must, "to the fullest extent possible," develop an EIS that rigorously explores and objectively evaluates all reasonable alternatives to the proposed action, including a no action alternative, and to discuss the reasons for eliminating any alternatives rejected from detailed study. 42 U.S.C. § 4332; 40 C.F.R. § 1502.14(a) and (d).

211. NEPA further requires that agencies state in the EIS how alternatives considered will achieve NEPA's requirements and the requirements of other environmental laws, including the Refuge Administration Act and ANILCA. 42 U.S.C. §§ 4331–32; 40 C.F.R. § 1502.2(d).

212. The Refuge Administration Act and ANILCA require the Secretary to manage the Arctic Refuge consistent with its seven conservation purposes and the oil and gas program purpose established in the Tax Act and to fulfill the mission of the Refuge System. 16 U.S.C. § 668dd(a)(3)(A), (4); ANILCA §§ 303(2)(B), 304–05; PLO 2214.

213. Contrary to these mandates, Defendants failed to analyze a reasonable alternative that adequately protects the Coastal Plain from significant environmental harm and is consistent with the conservation purposes of the Arctic Refuge. Instead, Defendants analyzed action alternatives that prioritize oil and gas development above those conservation purposes.

214. An alternative that minimizes environmental impact to the Coastal Plain would, among other things, place parameters on the Leasing Program that are consistent with the Tax Act; protect the integrity of the Coastal Plain and its wildlife (by restricting surface acre disturbance, limiting ice road construction, limiting seismic activity, delaying or phasing leasing, minimizing greenhouse gas emissions, protecting wildlife habitat, and minimizing other adverse environmental impacts); and otherwise be consistent with the conservation purposes of the Arctic Refuge. Such an alternative is a reasonable alternative under the purpose and need of the Leasing Program.

215. Defendants should have analyzed such an alternative in detail but did not do so.

216. Defendants' failure to analyze an alternative that would implement the Tax Act in a manner consistent with the conservation purposes of the Arctic Refuge renders the Record of Decision and the FEIS inadequate under NEPA.

217. Because Defendants failed to consider a reasonable range of alternatives, the Record of Decision and the FEIS on which it relies are arbitrary, capricious, an abuse of discretion, and otherwise not in accordance with law and without observance of procedure required by law contravening NEPA, 42 U.S.C. §§ 4331, 4332, its implementing regulations, and the APA, 5 U.S.C. §§ 701–06.

VIII. THIRD CAUSE OF ACTION
(Violation of NEPA and the APA: Inadequate Analysis of Greenhouse Gas Emissions and Climate Change Impacts)

218. State Plaintiffs incorporate all preceding paragraphs by reference.

219. Courts review claims challenging NEPA violations under the APA. *Pit River Tribe*, 469 F.3d at 778.

220. NEPA requires that federal agencies take a "hard look" at the significant impacts on the human environment of any proposed major federal action to foster informed decision making and informed public participation. *Methow Valley Citizens Council*, 490 U.S. at 350.

221. To fulfill this requirement, an EIS must carefully review the reasonably foreseeable direct, indirect, and cumulative environmental impacts of a proposed action and the significance of those impacts. 42 U.S.C § 4332; 40 C.F.R. §§ 1502.16, 1508.8.

222. An EIS must also discuss measures to mitigate adverse environmental consequences by avoiding, minimizing, rectifying, reducing, eliminating, or compensating for adverse impacts. 40 C.F.R. §§ 1502.14(f); 1502.16(h), 1508.20.

223. Defendants' FEIS inadequately and irrationally analyzes the direct, indirect, and cumulative impacts of greenhouse gas emissions and associated climate impacts from the proposed action.

224. The FEIS irrationally fails to analyze how Coastal Plain oil and gas development will impact global energy demand and emissions and irrationally concludes that 96% of Coastal Plain production will replace other U.S. production, likely underestimating program emissions; fails to consider the social cost of carbon or otherwise quantify the costs of carbon emissions; fails to analyze adequately methane emissions; and fails to analyze adequately the cumulative climate impacts of development and production.

225. For these reasons, Defendants failed to take a hard look at the greenhouse gas emission and climate change impacts of the Leasing Program and to consider measures to mitigate those impacts.

226. The Record of Decision and the FEIS on which it relies are thus arbitrary, capricious, an abuse of discretion, and otherwise not in accordance with law and without observance of procedure required by law, in violation of NEPA, 42 U.S.C. §§ 4331, 4332, and its implementing regulations, and the APA, 5 U.S.C. §§ 701–06.

IX. FOURTH CAUSE OF ACTION
(Violation of NEPA and the APA: Inadequate Analysis of Migratory Bird Impacts)

227. State Plaintiffs incorporate all preceding paragraphs by reference.

228. Courts review claims challenging NEPA violations under the APA. *Pit River Tribe*, 469 F.3d at 778.

229. In addition to NEPA's requirement that agencies take a "hard look" at significant environmental impacts and consider measures to mitigate those impacts, NEPA requires that agencies obtain information essential for making a reasoned choice among alternatives unless the costs of doing so would be "exorbitant." 40 C.F.R. § 1502.22.

230. The FEIS fails to adhere to these mandates by performing an inadequate analysis of impacts to migratory birds that in turn impairs Defendants' ability to consider the sufficiency of mitigation measures.

231. Specifically, the FEIS fails to include critical baseline data about migratory birds in the Coastal Plain. Instead, the FEIS relies on conclusory, unsupported statements and stale data and trivializes the significance of unknown data as inconsequential for the programmatic EIS. The FEIS improperly defers this data for site-specific impact statements. The FEIS further substantially understates the impact on migratory birds by predicating its incomplete analysis on surface disturbance acreage that is significantly

less than what is reasonably foreseeable under the Leasing Program as authorized in the Record of Decision.

232. The absence of essential data and failure to consider significant impacts precludes Defendants from making reasoned choices about programmatic parameters and potential mitigation measures, including but not limited to pre-leasing seismic activity, which tracts of land to lease, terms of lease stipulations, and sufficiency of required operating procedures.

233. In addition, Defendants' decision to defer analysis of migratory bird impacts violates NEPA's mandate that environmental analysis occur at the earliest possible time. 40 C.F.R. § 1501.2.

234. For these reasons, the Record of Decision and the FEIS on which it relies are arbitrary, capricious, an abuse of discretion, and otherwise not in accordance with law and without observance of procedure required by law, contravening NEPA, 42 U.S.C. §§ 4331, 4332, its implementing regulations, and the APA, 5 U.S.C. §§ 701–06.

X. FIFTH CAUSE OF ACTION
(Violation of Tax Act and APA)

235. State Plaintiffs incorporate all preceding paragraphs by reference.

236. The Tax Act contains a surface development provision that directs the Secretary, through BLM, to authorize up to 2,000 acres of federal land on the Coastal Plain "to be covered by production and support facilities (including airstrips and any

areas covered by gravel berms or piers for support of pipelines) during the term of the leases under the oil and gas program under this section." Tax Act § 20001(c)(3). This provision limits surface development to no more than 2,000 acres.

237. The Tax Act also contains a rights-of-way provision: "The Secretary shall issue any rights-of-way or easements across the Coastal Plain for the exploration, development, production, or transportation necessary to carry out this section." *Id*. § 20001(c)(2).

238. In the Record of Decision and the FEIS, Defendants unlawfully and irrationally interpreted the surface development provision as precluding an oil and gas leasing program that would allow less than 2,000 acres of surface disturbance, claiming such an alternative would be inconsistent with the Tax Act.

239. In the Record of Decision, Defendants also unlawfully and irrationally interpreted the 2,000-acre surface disturbance limit as applying only to facilities that are both production and support facilities. Under Defendants' interpretation, surface disturbance that does not fall within this narrow definition would not count towards the surface development cap, thereby allowing surface disturbance on the Coastal Plain to exceed the 2,000-acre limit Congress imposed.

240. Finally, Defendants unlawfully and irrationally interpreted the rights-of-way provision to override the 2,000-acre surface development limit by stating that BLM

must issue a right-of-way grant or necessary access authorization, providing Defendants another avenue to exceed the 2,000-acre surface development cap set by Congress.

241. Defendants' interpretation of the Tax Act violates the statute's plain language and contravenes Congressional intent. Thus, Defendants' adoption the Leasing Program based on these unlawful interpretations is contrary to the Tax Act and exceeds Defendants' statutory authority.

242. For these reasons, Defendants' interpretation of the Tax Act's surface acre development limit and the rights-of-way provision and adoption of the Leasing Program based on that interpretation is arbitrary, capricious, an abuse of discretion, and otherwise not in accordance with law, in violation of the Tax Act, § 20001, and the APA, 5 U.S.C. § 706.

XI. RELIEF REQUESTED

WHEREFORE, State Plaintiffs respectfully request that this Court:

A. Declare that Defendants have violated NEPA, the Refuge Administration Act, ANILCA, and the Tax Act, and further declare that Defendants abused their discretion and acted arbitrarily, capriciously, contrary to law, and in excess of their statutory jurisdiction and authority in authorizing the Leasing Program;

B. Vacate and set aside Defendants' Record of Decision, FEIS, and any other action taken by Defendants in reliance on either document;

C. Enter injunctive relief as necessary to prevent irreparable harm from

implementation of the Leasing Program based on the unlawful Record of Decision and FEIS;

D. Award State Plaintiffs all reasonable costs and fees as authorized by law; and

E. Award State Plaintiffs such other relief as the Court may deem just and proper.

DATED this 9th day of September, 2020.

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**motions for pro hac vice admission pending or forthcoming*

ADDENDUM B

Energyzt, Advisors, LLC,

Economic Assessment of Proposed Oil and Gas Lease Sales in the Arctic National Wildlife Refuge Coastal Plain

March 2019

REPORT

Economic Assessment of Proposed Oil and Gas Lease Sales In the Arctic National Wildlife Refuge Coastal Plain

Prepared by: Energyzt Advisors, LLC
March 2019

Prepared in Support of:
Comments filed on the Draft Environmental Impact Statement for the Coastal Plain Oil and Gas Leasing Program, 83 Fed. Reg. 67337 (Dec. 28, 2018) by the Attorneys General of States of Washington, Delaware, Oregon, Maine, Maryland, Michigan, Minnesota, New Jersey, New York, North Carolina, Rhode Island, Vermont, the Commonwealths of Massachusetts, Pennsylvania, and Virginia, and the District of Columbia.

DISCLAIMER

Energyzt Advisors, LLC ("Energyzt") is a global collaboration of energy experts who create value for our clients through actionable insights. Combining deep industry expertise with analytical capabilities, we help companies make informed business decisions.

This report is an independent assessment that was prepared by Energyzt and is based, in part, on publicly-available information which was not originated by or within the control of Energyzt. As such, Energyzt has made reasonable efforts to apply standard industry practice in assessing the applicability of the information for its proposed use, and has checked the veracity and completeness of such information to the best of its ability, but makes no claims as to its accuracy and has not performed an independent audit of data procured from the public domain. Where such information is relied upon, the source or sources are referenced.

In conducting the analysis, Energyzt has made certain assumptions with respect to conditions, events, and circumstances that may occur in the future. Where applicable, these assumptions and source materials are stated and described in the report. The methodologies used in performing the analysis are based on public projections and follow generally accepted industry practices. While we believe that such methodologies as summarized in this report are reasonable and appropriate for the purpose for which they are used, depending upon conditions, events, and circumstances that occur but are unknown at this time, actual results may differ materially from those embedded in the public projections and Energyzt scenarios that use those projections. Accordingly, Energyzt makes no assurances that the projections or forecasts will be consistent with actual results or performance.

Neither this report, nor any information contained herein or otherwise supplied by Energyzt in connection with this report, shall be used in connection with any proxy, proxy statement, and proxy soliciting material, prospectus, Securities Registration Statement, or similar document.

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In December 2017, Congress passed the Tax Cuts and Jobs Act ("Act"),[1] which included a provision requiring the Bureau of Land Management ("BLM") to administer a competitive program for the leasing, development, production, and transportation of oil and gas in the Coastal Plain (i.e., the "1002 Area") within the Arctic National Wildlife Refuge ("ANWR"). Mandating the sale of two leases of no less than 400,000 acres each, within a set period of time following the passage of the Act (the first lease within four years, and the second within seven years), the goal is to raise $2.2 billion in total revenues, of which half would be allocated to federal revenues and the other half to Alaska. The $1.1 billion in federal revenues is intended to offset the loss of tax revenues to the federal government resulting from passage of the Act. Current and projected market conditions, however, do not support the stated objectives:

1) **Uneconomic:** Oil from the 1002 Area is not economic to develop under current conditions and cannot compete with other domestic and international resources;

2) **Not Needed:** Oil from the 1002 Area is not needed for domestic demand and is likely to be sold to international markets; and

3) **Unlikely to Generate Sufficient Benefits:** Given current and anticipated market conditions, potential revenues from ANWR oil are unlikely to generate the hoped-for revenue levels.

Each of these points is summarized below.

OIL FROM THE 1002 AREA IS NOT ECONOMIC TO DEVELOP

Current prices for oil, as well as futures prices, are below the breakeven cost estimates required to produce oil from the 1002 Area, making the asset uneconomic to develop.

Over the long-term, increased supply from U.S. and global shale plays as well as decreases in demand due to carbon reduction policies and the convergence of multiple disruptive technologies regarding passenger vehicles is projected to maintain prices at current levels and may even result in lower prices.

Although some long-term projections may imply higher oil prices in the 2030s and beyond, those projections have lower prices in the near-term when the leases would be bid. They

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

also understate the rate of electric vehicle adoption expected to occur by the mid-2020s. If such projections are to be believed, however, the lease auctions should be delayed until oil prices recover (by no means a certainty), so as to maximize potential revenues that could be generated should market conditions eventually support drilling in the 1002 Area.

OIL FROM THE 1002 AREA IS NOT REQUIRED TO MEET DOMESTIC NEEDS

ANWR oil is among the most expensive and uncertain of all undeveloped oil reserves and would be nearly the last resource to be developed. Other domestic resources are less costly and better positioned for development compared to the 1002 Area.

As a result of significant oil reserves associated with shale and unconventional oil in the lower-48 states, the U.S. will soon be a net exporter of oil. The U.S. Energy Information Administration ("EIA") projects that the U.S. will be a net exporter of oil and oil products by 2020, extending through 2050 under the reference case.

As a net exporter, with marginal costs of shale production well below the breakeven price for developing ANWR oil, any oil that would be produced from the 1002 Area is unlikely to displace U.S. oil. Instead, it would be sold into international markets.

Although such sales would reduce the balance of trade, oil sales from the 1002 Area would not be used for domestic purposes. Indeed, limits on tankers that meet the requirements of the Jones Act could make such deliveries into the lower-48 states cost-prohibitive. Similarly, any natural gas that could be produced from the 1002 Area would only be sold into other markets if it were converted into Liquified Natural Gas ("LNG"), increasing production costs significantly given the need for an on-site liquefaction facility and for which no active Jones Act LNG vessel currently is operational. Therefore, shipping limits are likely to be another constraint to bringing energy commodities from the 1002 Area to market.

In the unlikely event that ANWR oil is produced, it would not be used to meet domestic needs or to displace existing or undeveloped energy resources in the U.S.; oil from the 1002 Area would be exported.

REVENUES FROM THE 1002 AREA LEASES ARE NOT LIKELY TO MEET REVENUES ORIGINALLY PROJECTED BY THE CBO

The original federal revenue estimate by the Congressional Budget Office ("CBO") is unsupported. As a result of competitive alternatives, current market conditions, and projected market conditions under current trends, the 1002 Area leases are not likely to generate significant lease revenues. If anything, the price paid would reflect a heavily discounted estimate of the extrinsic value associated with an asset that currently is "out-of-the-money" (i.e., more expensive than market prices would support). Under current and projected conditions, revenues would be far less than the $2.2 billion originally projected by the CBO.

For example, a review of land leases awarded during the past few years in the nearby National Petroleum Reserve in Alaska ("NPRA") indicate that land with a high potential for oil sold for an average of $40 per acre in 2016. In 2017, land with a low probability of oil sold for less than $10 per acre. The estimated revenues of $2.2 billion, even under the assumption that all of the potential acreage is leased results in an implied price of $1,400 per acre.[2] This value is unrealistic and unsupported by comparable sales in the region, especially given uncertainty surrounding volumes and cost to develop reserves in the 1002 Area, as well as current market conditions for oil that do not support development.

If leases are awarded, the lessee also would be required to make rental payments between acquisition of the lease and production. The CBO estimates that these would amount to only $2 million in total from 2022 to 2027. This is less than the estimated $10 million in costs anticipated to be incurred between 2018 and 2022 to administer the leases and perform requisite environmental reviews.

Under current and anticipated market conditions, it would be uneconomic to produce oil from the 1002 Area. Therefore, there would be no royalty payments. To the extent there are royalty payments, such payments would simply add to the cost of drilling, making the asset even less economic than alternatives that do not have an equivalent royalty payment.

In conclusion, the 1002 Area leases would not be economic assets. Any revenues would be well below what was originally projected and may barely (if at all) cover the costs of administering the program. The economic feasibility of these assets relies on a rising oil price projection. To maximize revenues under these leases, therefore, auctions should be delayed to a point where it is clear such oil is economic and needed for domestic purposes.

[2] There are an estimated 427,900 acres of high potential, 658,400 acres of medium potential and 477,200 acres of low potential, (BLM Draft EIS, p. 2-39) for a total of 1,563,500 acres (BLM Draft EIS, p. B-1).

ENERGYZT

Economic Assessment of Proposed Oil and Gas Lease Sales In the Arctic National Wildlife Refuge Coastal Plain

- INTRODUCTION

Under the Act, Congress required that two lease sales be made in the 1002 Area for at least 400,000 acres each (out of a total area acreage of 1.5635 million acres). Legislation required that the two lease sales occur over a seven-year period following enactment (the first auction by 2021 and the second by 2024).

Drilling in the ANWR is forecasted to bring $2.2 billion in new lease bid revenues by 2027 which would be split evenly between the U.S. government and Alaska. For each lease awarded, the lessees will have to pay the federal government bonus bids to acquire the leases, annual rent to retain the leases through production, and a royalty based on the value of any oil and gas production from the leases. Rental payments would be due between the purchase of the lease and when production begins, estimated by the CBO at around $2 million in total between 2022 to 2027.[1] The legislation establishes a 16.67% royalty on oil and gas produced from the 1002 Area leases.

Energyzt was asked to examine the stated objectives of the proposed leases for the 1002 Area within ANWR given the context of current and anticipated market conditions. Specifically:

1) How do the economics of the 1002 Area oil production compare to current market conditions?

2) Is oil that would be produced from the 1002 Area anticipated to offset domestic demand?

3) Is production from the 1002 Area anticipated to decrease global oil prices?

4) Is it likely that $1.1 billion in federal revenues will be generated to offset the

[1] Congressional Budget Office (CBO), "A Legislative Proposal Related to the Arctic National Wildlife Refuge," November 8, 2017, https://www.energy.senate.gov/public/index.cfm/files/serve?File_id=3454269F-6DC5-4E6C-9F23-99D1E3E64698

loss of federal revenue resulting from passage of the Act?

This report addresses each of these questions in the context of current and anticipated market conditions, including a market assessment of the supply and demand for oil.

The research and analysis described in this report concludes the following:

- Under publicly-available breakeven price projections, the anticipated cost to produce oil from the 1002 Area is higher than current market prices for oil.
- Futures prices indicate a similar result, indicating that oil from the 1002 Area currently is an uneconomic resource.
- Although short-term pricing can change, longer-term trends in global supply and demand for oil indicate that oil that could be produced from the 1002 Area is not likely to be economic.
- It would therefore be prudent to delay the lease auctions until such time that the oil may become economic to develop in order to preserve an opportunity to maximize revenues.
- Production would not be required for domestic needs; if produced, oil from the 1002 Area likely would be sold into global markets. For this reason, oil from the 1002 Area would not have any material impact on U.S. energy independence.
- The relatively small amount of oil production compared to global supply and demand would have negligible impact on prices, especially if technological trends come to fruition by 2030, as projected.
- Based on economic conditions and recent auctions for leasing rights on the North Slope, federal revenues that can be anticipated to be generated by the 1002 Area leases are not likely to meet the stated objective of raising $1.1 billion, rental payments are minimal, and future royalties would be zero under anticipated conditions where the 1002 Area remains uneconomic.

This report provides the basis for these conclusions in more detail.

- **Section 2** provides a brief summary of the 1002 Area within ANWR, including its projected reserves and breakeven costs compared to short-term market price projections.
- **Section 3** provides the broader context of global oil markets in which oil from the 1002 Area would be sold.
- **Section 4** describes technological changes occurring on the supply side of oil, specifically the shale revolution in the U.S. and how that would impact the domestic need for and competitiveness of oil from the 1002 Area within ANWR, concluding

that sales of such oil are likely to be international versus domestic.

- **Section 5** summarizes technological changes happening today and anticipated tipping points expected to converge in the 2020s that would diminish domestic and potentially international demand for oil, rendering the 1002 Area even more uneconomic and unlikely to produce oil.
- **Section 6** uses information from the previous sections as well as third party assessments to estimate what the potential revenues from the 1002 Area oil production would be to the U.S. and concludes that $1.1 billion is highly unlikely to be generated by the leases and rental payments through 2031.
- **Section 7** summarizes the conclusions of this report.
- **Appendix A** lists the documents, data and resources relied upon in developing this report.

- ABOUT THE ARCTIC NATIONAL WILDLIFE REFUGE

Established in 1960, ANWR is 19.64 million acres of contiguous land in Northern Alaska originally established as a refuge to protect wildlife and the environment.

In 1980, the Alaska National Interest Lands Conservation Act ("ANILCA") enacted by Congress designated ANWR as part of the conservation lands, for purposes of:[2]

- Conserving animals and plants in their natural diversity;
- Protecting water quality and quantity;
- Ensuring a place for hunting and gathering activities; and
- Fulfilling the international fish and wildlife treaty obligations.

However, Section 1002 of the ANILCA provided that decisions about usage, management and protection of around 1.5 million acres in the coastal plain parcel, subsequently known as the "1002 Area," would be deferred.

A limited number of studies on the 1002 Area began after the Act was passed, with updates to Congress. In 1987, the U.S. Department of Interior issued a report to Congress on the 1002 Area, finding that there was a mean average of 13.8 billion barrels

[2] Alaska National Interest Lands Conservation Act, Pub. L. No. 96–487, December 2, 1980, 94 Stat. 2371 (1980).

of in-place oil resources estimated in the reserve.[3] The U.S. Geological Survey ("USGS") has provided some updated information to inform decisions on land management, environmental issues, and strategy. Private companies also have performed their own studies on limited areas. These assessments offer a wide range of conclusions regarding the amount of recoverable oil and the estimated costs of extracting those reserves.

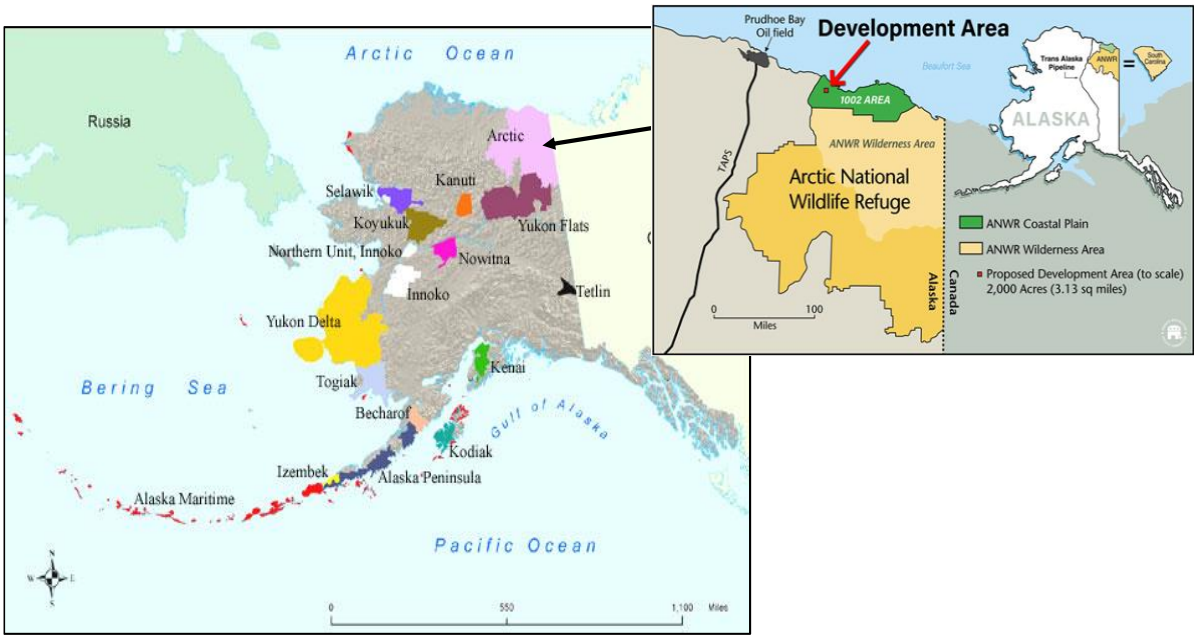
There is significant uncertainty surrounding the volumes of oil reserves actually available, the distribution of those reserves, and the breakeven cost of recovering those reserves. Most estimates indicate that the breakeven costs of oil from ANWR could be amongst the most expensive of identified undeveloped crude resources in the industry.[4]

A. ANWR is not ideally located

ANWR is one of 16 national wildlife refuges in Alaska, located in the far Northeast corner of the state. The refuge runs nearly 200 miles along the border of Canada and has approximately 125 miles of coastline along the Arctic Ocean.[5] The 1002 Area, located on the coastal plain, takes up around two-thirds of the ANWR coastline in the northern-most reaches of the refuge (**Figure 1**).

[3] U.S. Fish and Wildlife Service, "Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment," April 1987, https://www.fws.gov/uploadedFiles/Region_7/NWRS/Zone_1/Arctic/PDF/1987leis.pdf
[4] Shell, "Energy Transition Report," 2018.
[5] U.S. Fish and Wildlife Service, "Management of the 1002 Area within the Arctic Refuge Coastal Plain," February 14, 2014, https://www.fws.gov/refuge/arctic/1002man.html

Figure 1: Location of ANWR and 1002 Area[6]



B. Additional transportation infrastructure is required

The 1002 Area is located less than 85 miles east of the Trans-Alaska Pipeline System ("TAPS").[7] TAPS was built between 1974 to 1978 in response to the first energy crisis to bring oil from the Prudhoe Bay Oil Field on the North Slope to the warm-water port at Valdez on the state's southern coast.[8] Roughly 800 miles long, TAPS is the longest pipeline system in the world. It takes nearly 12 days for oil injected into the pipeline from the North Slope to reach the Port of Valdez where crude oil tankers can then deliver the oil to refineries in the U.S. and abroad.[9]

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[6] USGS, https://pubs.usgs.gov/fs/fs-0028-01/fs-0028-01.htm;
US Forest Service, https://www.fws.gov/alaska/nwr/map.htm

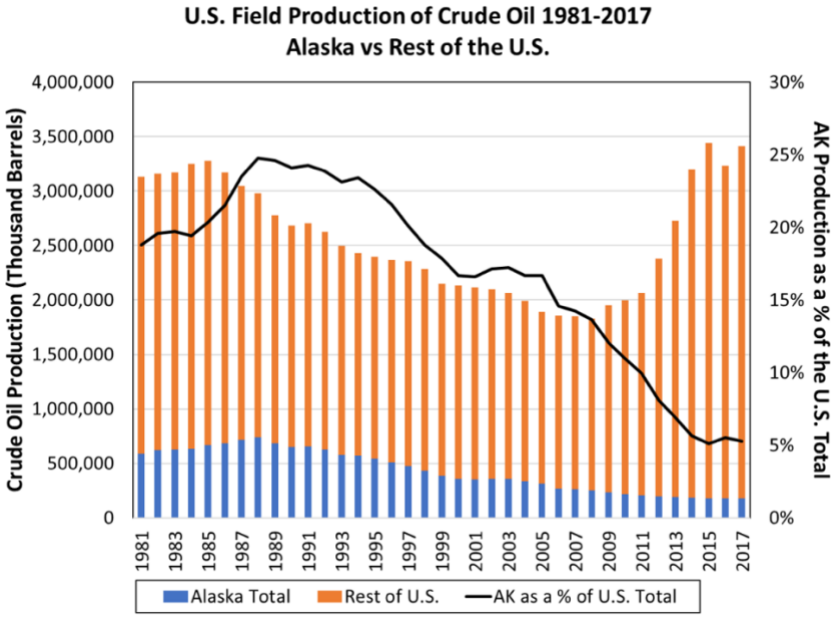
[7] Attanasi, E. D., USGS, "Undiscovered oil resources in the Federal portion of the 1002 Area of the Arctic National Wildlife Refuge: An economic update," 2005, p. 8,
http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.405.6106&rep=rep1&type=pdf
Lisa Murkowski indicates that it is less than 60 miles away from TAPS in a Natural Gas Intel article,
https://www.naturalgasintel.com/articles/108979-bill-would-allow-limited-development-of-alaskas-1002-area
A fact sheet issued by the Institute for Energy Research suggests that TAPS is 70 miles away,
https://www.instituteforenergyresearch.org/fossil-fuels/gas-and-oil/anwr-fact-sheet-pipeline-starved-potential-untapped/#_edn13

[8] Valdez was site of the famous Exxon Valdez oil spill that released over 11 million gallons of crude oil and cost upwards of $7 billion, History.com, "Exxon Valdez Oil Spill," March 4, 2019,
https://www.history.com/topics/1980s/exxon-valdez-oil-spill

[9] Alyeska Pipeline, "The Facts," 2007, p. 19, http://large.stanford.edu/courses/2011/ph240/mina1/docs/FINALfacts-2007.pdf

TAPS throughput peaked on January 14, 1988, at around 2.145 million barrels per day.[10] Since then, reserves in Prudhoe Bay have declined, and oil transported across TAPS has declined to current flow rates of around 0.5 million barrels per day, or less than 200 million barrels per year. Oil delivered from the North Slope via TAPS is now around 5 percent of total U.S. production while shale oil production in the lower-48 states has more than made up the difference (**Figure 2**).

Figure 2: Alaskan Oil Production versus the Rest of the U.S.[11]



Once pipeline oil throughput falls below a certain level, oil flows can slow to a point where icing and wax buildup necessitate more frequent cleaning of the pipeline. If TAPS cannot be used to transport oil, it would have to be shut down and, by contract, dismantled.[12] Indeed, one of the stated values of drilling in the 1002 Area is to provide throughput at a level that supports TAPS and maintains the option value for future drilling.[13] This value assumes, however, that oil reserves from the Arctic have the

[10] American Oil & Gas Historical Society, https://aoghs.org/transportation/trans-alaska-pipeline/
[11] USGS, https://pubs.usgs.gov/fs/fs-0028-01/fs-0028-01.htm;
US Forest Service, https://www.fws.gov/alaska/nwr/map.htm
[12] In 2012, the EIA projected that TAPS would be shut down by 2025 in the event that oil prices generated less than $5 billion per year and flow rates were below 350,000 barrels per day, https://www.eia.gov/todayinenergy/detail.php?id=7970
[13] Bradley, Robert, "ANWR: Make Alaska Great Again," Forbes, January 12, 2018, https://www.forbes.com/sites/robertbradley/2018/01/12/anwr-make-alaska-great-again/#7f68bf09782f

potential to be acquired and a probability of being economic in the future, which is far from certain.

Although TAPS is a potential transportation solution to bring ANWR oil to market, there currently are no pipelines in the 1002 Area that could be used to transport oil to market. Therefore, new pipelines would have to be built to transport oil from the wellhead to TAPS. Given current levels of throughput from Prudhoe Bay that are around 1.5 million barrels per day less than its peak,[14] there should be enough incremental capacity available on TAPS to deliver the entirety of production from the 1002 Area assuming it can be gathered and delivered to the pipeline. If production were to exceed this amount, or more competitive options from the nearby National Petroleum Reserve of Alaska were to contract for the TAPS capacity first, alternative means of transportation would be required, effectively increasing the break-even cost of production. Therefore, maximum potential production from the 1002 Area can be capped at around 1.5 million barrels per day or 11 billion barrels over a 20-year period, similar to the maximum reserves originally estimated by the USGS in 1998 (see **Section C**).

The bigger constraint, however, could come in the form of vessels needed to ship the oil from Valdez to the lower-48 states in the U.S. Once oil is delivered to Valdez, it must be shipped another 2,500 to 5,000 miles via specialized crude oil tankers.[15] Depending on market conditions, and congestion at U.S. ports, oil can be processed in Alaska (around 15 percent), shipped to Hawaii or internationally (around 5 percent) or to California and Washington (80 percent).[16] Shipping oil from Alaska to U.S. ports of call requires large Jones Act tankers at shipping costs of about $5.50 per barrel.[17]

Under the Jones Act, vessels transferring commodity from one U.S. port to another U.S. port are required to be U.S. flagships, built in the U.S., and operated by a

See also Yale Environment 360, https://e360.yale.edu/features/trans-alaska-pipeline-is-fueling-the-push-to-drill-arctic-refuge and "Making the case for ANWR," http://anwr.org/2013/08/making-the-case-for-anwr/

[14] Alyeska Pipeline, "Pipeline Operations: Throughput," https://www.alyeska-pipe.com/TAPS/PipelineOperations/Throughput

[15] Conoco Phillips, http://alaska.conocophillips.com/who-we-are/alaska-operations/polar-tankers-us-west-coast/

[16] "Analysis of Projected Crude Oil Production in the Arctic National Wildlife Refuge: Issue in Focus from the Annual Energy Outlook, 2018," May 2018, p. 3, https://www.eia.gov/outlooks/aeo/pdf/ANWR.pdf

[17] *Ibid*.

majority of American crew.[18] However, there are a limited number of Jones Act oil tankers large enough to deliver oil from Valdez to the state of Washington.[19] As production from Prudhoe Bay slowed, a number of tankers retired to the point where only 11 remain.[20] Each vessel can make around 2 round trips per month. With carrying capacity of 0.5 to 1 million barrels per vessel, the existing fleet can only transport 265 million barrels per year or 0.75 million barrels per day.[21] Therefore, the constraint on transporting oil from the 1002 Area to domestic markets is less likely to be pipeline infrastructure and more likely to be shipping constraints.

Addressing the constraints associated with the need for large, double-hulled oil tankers that can transport long distances could require new ships and long-term contracts at prices and commitments high enough to cover the costs. This would add the risk of another long-term obligation in addition to the standard shipping costs required to bring ANWR oil to market from Alaska via the TAPS pipeline costs.[22]

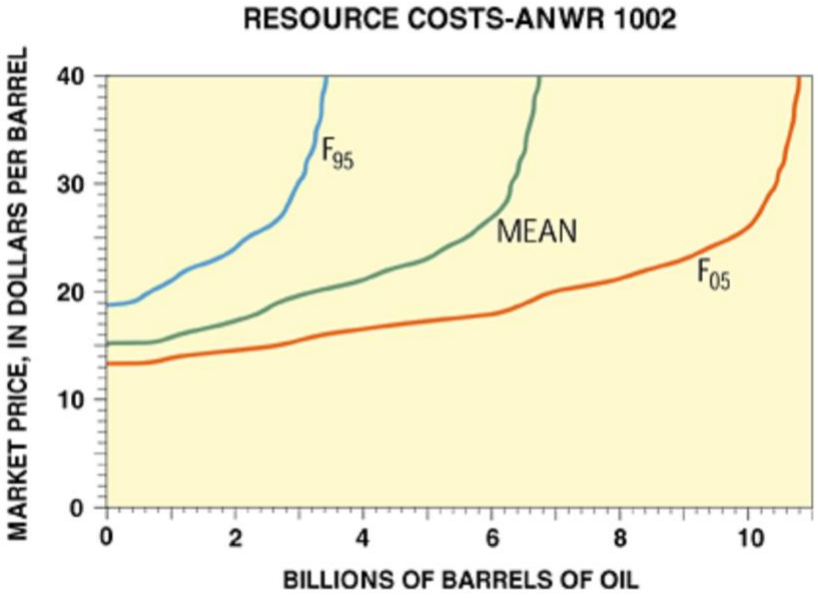
C. The amount of oil in the 1002 Area is limited

Following an initial 1987 report, a group of 40 scientists from the USGS performed an update in 1998 regarding the potential amount of oil and economic cost of extraction.[23] In that year, oil prices were trading between $18 to $27 per barrel, the nadir before what began a decade-long increase that would track to over $100 per barrel by

[18] United States Code: Merchant Marine Act, 1920, 46 U.S.C. §§ 861-889 (1958).
[19] Buzy, Mark, U.S. Department of Transportation, "The State of the U.S. Flag Maritime Industry," January 17, 2018, https://www.transportation.gov/content/state-us-flag-maritime-industry
In the Jones Act tanker category, there are 43 tankers, of which 11 were Aframax or Suezmax vessels that carry 800 to 1,500 MBbt. Those 11 larger vessels were dedicated to the Alaska North Slope or moving crude from the Port of Valdez. The medium or "Handysize" ships can then transport along the West Coast.
[20] Fielden, Sandy, "Ship to Wreck – Can the Jones Act Tanker Market Keep Growing?" October 25, 2015, https://rbnenergy.com/ship-to-wreck-can-the-jones-act-tanker-market-keep-growing See also an updated list of Jones Act vessels with the 11 crude oil tankers identified as "Crude Oil Tanker," Appendix A, National Cooperative Freight Research Program, "Marine Highway Transport of Toxic Inhalation Hazard Materials," National Academies Press, Transportation Research Board, 2012, https://www.nap.edu/read/22737/chapter/13#54 as confirmed in an updated list as of February 4, 2019 published by the U.S. Department of Transportation, Maritime Administration, https://www.maritime.dot.gov/sites/marad.dot.gov/files/oictures/DS_USFlag-Fleet_20190204_0.pdf
[21] Assumes 80,000 to 160,000 DWT (averaging 0.75 million barrels) for an Aframax; and 120,000 to 200,000 DWT (1 million barrels) for a Suezmax, http://maritime-connector.com/wiki/aframax/ and https://itstillruns.com/average-capacity-oil-tanker-7486538.html
[22] Holodny, Elena, "This map shows how much it costs to transport oil across the US," *Business Insider*, June 10, 2016, https://www.businessinsider.com/map-oil-cost-shipping-2016-6
[23] USGS, "The Oil and Gas Resource Potential of the Arctic National Wildlife Refuge 1002 Area, Alaska," 1998, https://pubs.usgs.gov/of/1998/ofr-98-0034/ANWR1002.pdf https://pubs.usgs.gov/fs/fs-0028-01/fs-0028-01.htm

2008 (see **Section ⚜o**). At that time, the USGS estimated that the amount of technically recoverable oil within the Coastal Plain ranged from 4.3 billion to 11.8 billion barrels in total (95% and 5% probability). A subset of those reserves, between 3 to 10 billion barrels of oil, with a mean of 7.7 billion barrels, would be economically recoverable at prices ranging from $13 to $40 per barrel (1996 dollars) (**Figure 3**).

Figure 3: USGS 1998 Projection of ANWR Economically Recoverable Reserves[24]



Anticipated reserves were expected in the western section of the 1002 Area, occurring in multiple accumulations around 10 different plays. Further research was required. In addition, this economic estimate would have to be updated to reflect inflation for construction cost, materials and labor to reflect current dollars. Other than a private exploration that has been kept confidential, there are no updates to the 1998 study regarding potential volumes.

Since the initial estimates in the 1980s and 1990s, additional research and drilling has been performed to estimate the location of potential reserves. The findings conclude that there is not likely to be a single large pool, but smaller gatherings of oil scattered throughout as many as 35 small traps in the area,[25] increasing the cost to

[24] USGS, https://pubs.usgs.gov/fs/fs-0028-01/fs-0028-01.htm
[25] Bourne, Joel, "Arctic Refuge Has Lots of Wildlife – Oil, Maybe Not So Much," National Geographic, December 19, 2017, https://news.nationalgeographic.com/2017/12/arctic-wildlife-refuge-tax-bill-oil-drilling-environment/

extract as well as transportation infrastructure. The most recent EIA study assumes that the number of traps could be as low as 37 and as high as 64, with a mean ANWR production assumption of 53 traps.[26]

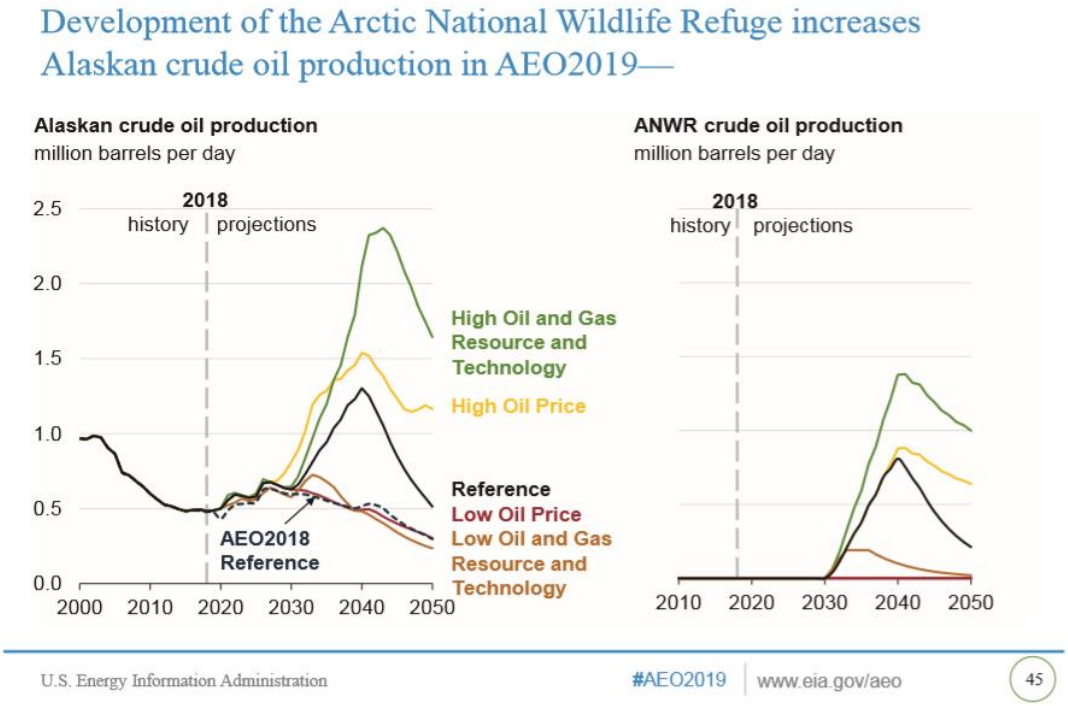
In addition, there have been disappointing results. For example, in 2015, Shell spent $7 billion drilling offshore in Alaska nearby the 1002 Area, finding very little oil and gas.[27] With much lower output than originally projected, Shell ended its project after drilling only one well and cut any funding for further drilling plans in the Arctic citing the poor results, along with high costs of operating in the Arctic, and a tough local and regulatory climate as reasons for doing so.[28]

The EIA recently studied how ANWR would impact the 2018 Annual Energy Outlook ("AEO 2018") projections and incorporated these findings into the 2019 Annual Energy Outlook ("AEO 2019"). Under the "Mean ANWR" case for the AEO 2018 Update, the EIA estimated an increase in production from 2031 to 2050.[29]

AEO 2019 included different scenarios, based on assumed oil prices, with production starting in 2031 and peaking in 2041 under the "Reference Case" and "High Oil Case" (**Figure 4**). In the "Low Oil Price" case, there is no incremental Alaskan crude oil production from ANWR because it is not economic to develop under projected oil prices that remain below $50 per barrel ($2018) through 2050.[30] The EIA also includes a "Low Oil and Gas Resource Technology" case where only 0.7 billion barrels is produced between 2031 and 2050.[31]

[26] Wagener, Dana, U.S. Energy Information Administration, "Analysis of Projected Crude Oil Production in the Arctic National Wildlife Refuge," May 23, 2018, https://www.eia.gov/outlooks/aeo/anwr.php
[27] Macalister, Terry, "Shell ceases Alaska Arctic Drilling; exploratory well oil gas disappoints," The Guardian, September 28, 2015, https://www.theguardian.com/business/2015/sep/28/shell-ceases-alaska-arctic-drilling-exploratory-well-oil-gas-disappoints
[28] Koch, Wendy, "3 Reasons Why Shell Halted Drilling in the Arctic," National Geographic, September 28, 2015, https://news.nationalgeographic.com/energy/2015/09/150928-3-reasons-shell-halted-drilling-in-the-arctic/
[29] Wagener, Dana, U.S. Energy Information Administration, "Analysis of Projected Crude Oil Production in the Arctic National Wildlife Refuge," May 23, 2018,
[30] AEO 2019, pp. 33, 45 – 46.
[31] *Ibid*., p. 46.

Figure 4: U.S. Production in EIA Reference Case with ANWR Production Scenarios[32]



In other words, the total amount of reserves in the 1002 Area is unknown and uncertain. As the EIA readily admits:

> The ANWR projections are highly uncertain because of several factors that affect the timing and cost of development, little direct knowledge of the resource size and quality that exists in ANWR, and inherent uncertainty about market dynamics.[33]

In the "Reference Case," AEO 2019 assumes crude oil production of 6.8 billion barrels between 2031 and 2050, effectively adopting the USGS mean case from the 1998 estimates. This scenario, however, assumes Brent oil prices of around $75 per barrel (2018$) through 2022, rising to $100 per barrel ($2018) by 2035.[34] Although this is lower than AEO 2018 price projections,[35] it is still high enough under the EIA assumptions to

[32] *Ibid*., p. 45
[33] *Ibid*., p. 46.
[34] *Ibid*., p. 33.
[35] U.S. EIA, "Annual Energy Outlook 2018," February 6, 2018, oil price projections begin at around $80 per barrel and were projected to rise to $100 per barrel by 2030.

support drilling in the 1002 Area, in contrast to current prices or the EIA "Low Oil Price" scenario of around $50 per barrel ($2018).

That said, the AEO 2019 Reference Case is unrealistic for a number of reasons:

1) The EIA projection is limited to inclusion only of existing policies,[36] and therefore does not reflect additional anticipated efforts to reduce carbon emissions or application of a carbon tax;

2) The EIA consistently underestimates price trends (illustrated in **Section ⚜o**); and

3) AEO 2019 oil price projections reflect a fairly low view of electric vehicle adoption rates and assumes linear adoption over time rising to only 1.5 million in sales per year by 2030 (discussed in **Section ⚜o**).[37]

AEO projections can only be based on existing policy; the moratorium on drilling was lifted after the modeling for AEO 2018 was complete. Therefore, until the 2017 Tax Cuts and Jobs Act, ANWR production was not included in recent AEO projections. Once legislation required leases to be issued for drilling in ANWR, the EIA included the potential impact in its report.

Whether or not 1002 Area reserves can even be extracted economically under realistic price projections in a timely manner is another matter. The next section discusses the potential for natural gas in ANWR followed by a discussion on the estimated amount of time between lease purchase and production and estimates of the all-in cost to produce oil from the 1002 Area and how that compares to other options domestically and globally.

D. The value of natural gas reserves is negligible

The 1002 Area leases will be for oil and natural gas. Natural gas often is produced as a byproduct of oil extraction. In locations such as Texas where a natural

[36] U.S. Energy Information Administration, "EIA's Annual Energy Outlook is a projection, not a prediction," May 17, 2016, https://www.eia.gov/todayinenergy/detail.php?id=26272
https://www.eia.gov/outlooks/aeo/assumptions/
https://www.eia.gov/outlooks/aeo/retrospective/
[37] *Ibid.*

gas pipeline system already exists, that natural gas can be transported to market and monetized. In areas such as North Dakota, natural gas has no way to be shipped to market and is flared, releasing significant carbon emissions into the atmosphere.[38]

Other oil fields on the North Slope produce natural gas, but only for limited purposes. There are no pipelines that can be used to ship natural gas to large load centers. Instead, the natural gas is reinjected into the oil fields to assist with oil extraction or otherwise consumed as part of the natural gas and crude oil production process.[39]

Although proposals for construction of a new natural gas pipeline linking Alaska with the lower-48 states have been contemplated, a pipeline of that distance and size currently is not economic, especially with the availability of inexpensive shale gas production co-located near the existing pipeline system. The alternative of a new LNG export terminal near Anchorage also has been proposed, which would be fed by a new 800-mile long pipeline. Although the Federal Energy Regulatory Commission is scheduled to review the proposal for approval by 2020, economic realities may prevail. Lack of potential buyers and increasing competition from LNG exports to Asian markets has prompted the new CEO of Alaska's state gas corporation to inform legislators that the project – estimated to cost $43 billion – would be shut-down if investors or customers do not appear in early 2019.[40]

Therefore, any revenues associated with the 1002 Area is assumed to be associated exclusively with oil market conditions; natural gas currently has no way to reach market.

E. Production requires at least 10 years of lead-time

Uncertainty surrounding information on 1002 Area reserves, location and

[38] The amount flared in 2018 alone – 527 million cubic feet per day -- was enough to meet all of the natural gas needs for North Dakota and South Dakota. Dalrymple, Amy, "North Dakota natural gas flaring hits records, improvement expected in 2019," *Bismark Tribune*, December 25, 2018, https://bismarcktribune.com/bakken/north-dakota-natural-gas-flaring-hits-records-improvement-expected-in/article_201e38f4-54db-5b96-a03a-31af0fd077e0.html

[39] US EIA, "Alaska: State Profile and Energy Estimates," https://www.eia.gov/state/analysis.php?sid=AK#49

[40] Bradner, Tim, "Alaska might give up on North Slope gas pipeline, LNG export terminal: Official," S&P Global, February 28, 2019, https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/022819-alaska-might-give-up-on-north-slope-gas-pipeline-lng-export-terminal-official

economics has another uncertainty in the form of time and commitment. The EIA addendum does not assume any production begins until 2031, around 10 years after the first lease is legislatively required to be signed. This time period is required for further exploration, appraisal, permitting and development, and could be extended even further with the potential of an extensive litigation battle.

The timeframe required from lease signing to output is important for three reasons:

1. **Research Required:** There are a significant number of additional studies required along with investment in testing and planning before drilling can begin, requiring significant expenditures by the lease holder.

2. **Capital Investment and Construction Time Required:** In addition to the upfront lease costs and studies, there would be significant capital investment and construction time required to be able to establish wells and transportation infrastructure to bring the oil to market.

3. **Dynamic Market Conditions:** Oil prices are incredibly volatile, yet are key to determining economic reserves as well as potential return on investment. Current as well as projected conditions are important to understanding potential value to be obtained from the proposed leases and whether or not any production could be realized if those leases are purchased. Even assuming current market conditions appeared to be favorable (which they are not), those conditions could change dramatically in the future due to a number of supply and demand trends,[41] resulting in stranded assets following the upfront investment phase.[42]

These timing constraints and long-term commitment are important to consider when examining how market conditions are expected to change and how potential bidders will incorporate this uncertainty into their lease bids. Oil companies are moving away from long-term commitments that limit their flexibility to shorter-term

[41] Supply trends are discussed in **Section □**; demand trends are discussed in **Section □**.
[42] As an example, the major oil companies all had to take write-offs for their investment in Canadian oil sands once oil prices fell at the end of 2014.

plays that require less upfront fixed costs, especially given other, more flexible opportunities with quicker pay-outs in the U.S.[43] Committing to a long-term exploration and development timeframe in an expensive and controversial part of the world in the face of potential disruption and climate policy impacts does not seem to be a wise focus of capital investment dollars. As a result, recent investment by the large oil companies is being directed to shale plays in the lower-48 states.[44]

F. The 1002 Area is an expensive source of oil

Estimated costs to extract oil from the 1002 Area have increased since the 1998 USGS study, which estimated that an average of 5.2 billion barrels could be recovered for around $24 per barrel ($1998). The USGS updated the estimates in its most recent assessment, conducted in 2005 when it was estimated that 7.1 billion barrels could be economically recoverable at a price of $67.65 per barrel ($2017), suggesting that much of the oil in the 1002 Area would be developed with little to no profit at today's prices.[45]

Another estimate establishes break-even oil prices for the 1002 Area higher than the USGS estimate at about $78 per barrel.[46] A study conducted by Rystad Energy looked at recent cost trends and provided an estimate for the cost of drilling in the Arctic; high costs of construction and development of the oil, along with its transportation, would result in an average breakeven price of $75 to $80 per barrel. However, even this estimate may not include other costs associated with long-term commitments tied to new Jones Act ships. Regardless, a mean breakeven price of $78 per barrel makes oil from the 1002 Area significantly more expensive and riskier than U.S. shale development opportunities that have costs at around half of that level.[47]

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[43] Denning, Liam, "Chevron-Exxon Texas Showdown Spells Trouble for Frackers," Bloomberg Opinion, March 5, 2019, https://www.bloomberg.com/opinion/articles/2019-03-05/chevron-exxon-texas-showdown-spells-trouble-for-frackers

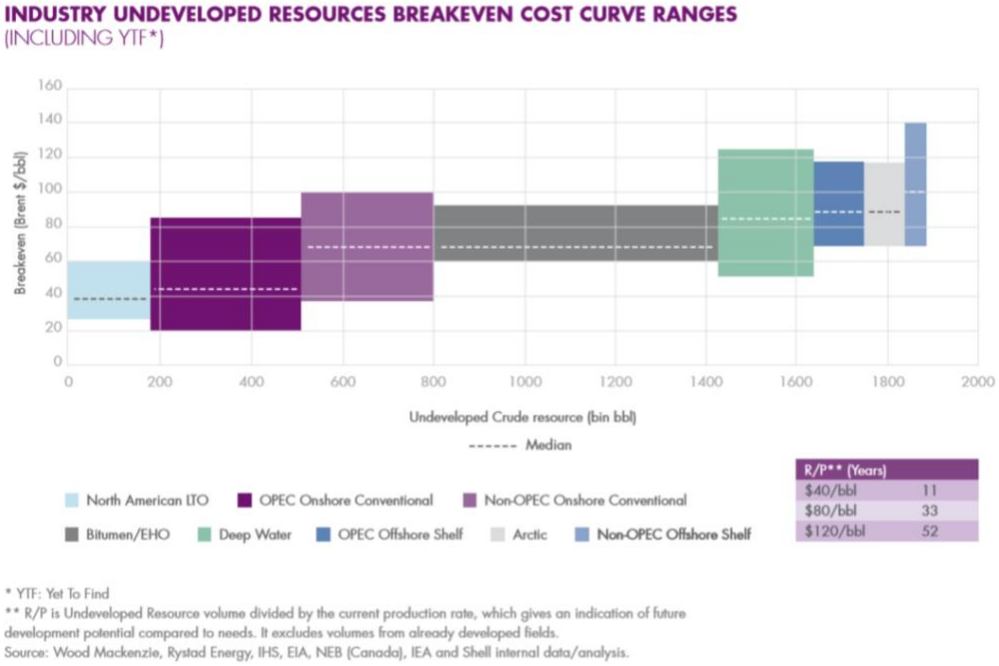
[44] Blum, Jordon, "Exxon, Chevron plan to dominate Permian, grow as others cut back," *Houston Chronical*, March 5, 2019, https://www.chron.com/business/energy/article/Exxon-Chevron-plan-to-dominate-Permian-grow-as-13663733.php

[45] Congressional Research Service, "Arctic National Wildlife Refuge (ANWR): An Overview," January 9, 2018, https://fas.org/sgp/crs/misc/RL33872.pdf

[46] Rystad Energy, "Global Liquids Cost Curve: Shale is pushing out oil sands and Arctic, Offshore is still in the race," June 12, 2014, https://www.rystadenergy.com/newsevents/news/press-releases/global-liquids-cost-curve

[47] See **Section** □.

Figure 5: Shell Oil Assessment of Relative Costs of ANWR versus Other Resources[48]



Other estimates place the median break-even price even higher with a wide range reflecting the uncertainty of the extraction and transportation costs. For example, Shell Oil estimates the median breakeven price of undeveloped Arctic oil at almost $90 per barrel (i.e., the Arctic region represented by the light gray box, second from the end) (**Figure 5**). Of the industry's undeveloped resources, ANWR is anticipated to be one of the most expensive oil reserves to develop.

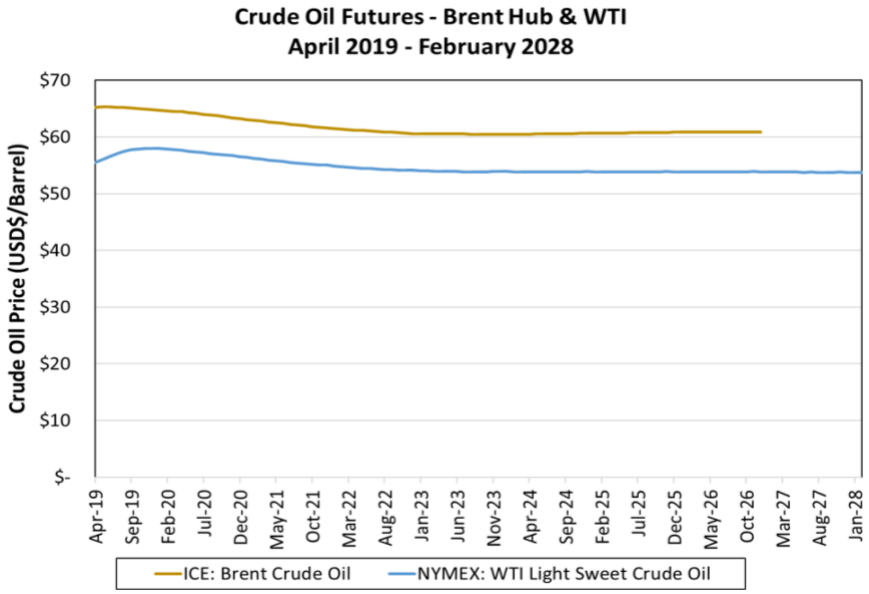
There are many other undeveloped resources both domestically and globally that would be more economic to develop first. If new oil reserves are needed, ANWR would be almost the last location that should be leased and developed compared to alternatives based on breakeven costs.

G. Oil from the 1002 Area currently is not economic

A comparison of potential breakeven cost curves for the 1002 Area to futures prices indicate that market prices do not support drilling in ANWR. Futures prices for Brent Crude have settled in at $60 per barrel through the mid-2020s; Western Texas Intermediate ("WTI") reflecting domestic oil prices is trading lower at around $53 per barrel (**Figure 6**).

[48] Shell, "Energy Transition Report," p. 35.

Figure 6: Futures Prices for Oil[49]



A number of large oil producers similarly report prices consistent with futures. Shell expects oil to remain around $60 per barrel through 2021.[50] BP has stated that it sees oil prices in 2025 as being similar to the 2017 level of $55 per barrel.[51]

The EIA also projects near-term prices at around $75 per barrel ($2018) through the mid-2020s, with a low oil price estimate below $50 per barrel.[52] In February 2019, the EIA revised its Short-Term Energy Outlook (STEO) to be lower than its January STEO due to expectation of slower growth in demand, forecasting 2020 prices of $62 per barrel for Brent and $58 per barrel for WTI.[53] Consensus among multiple forecasts through the early 2020s would indicate that the reserves are not expected to be economic when the leases are bid.

With a breakeven price of around $78 to $90 per barrel – well above where oil currently is trading -- the 1002 Area oil is not economically recoverable. Projections indicate that 1002 Area reserves would not be economic when the first set of leases is bid. As discussed in more detail in **Section □,** the cost of extracting and delivering oil from the ANWR Coastal Plain is well above the cost of bringing shale oil in the lower-48 states to market.

[49] CME Group, "Oil Futures Quotes," February 27, 2019, https://www.cmegroup.com/trading/energy/crude-oil/brent-crude-oil.html
[50] Royal Dutch Shell plc., Fourth Quarter 2018 Results, January 31, 2019, https://www.shell.com/investors/news-and-media-releases/investor-presentations.html
[51] British Petroleum (BP), "Oman 2018: Upstream Investor Day & Fieldtrip," December 2018, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/investors/oman-2018-investor-day-bernard-looney-plenary.pdf
[52] U.S. EIA AEO 2019, p. 34.
[53] U.S. EIA, "Short-Term Energy Outlook," February 2019, https://www.eia.gov/outlooks/steo/
See also, OGJ Editors, "EIA revised down its oil price forecast," *Oil & Gas Journal*, February 12, 2019, https://www.ogj.com/articles/2019/02/eia-revised-down-its-2020-oil-price-forecasts.html

The ANWR reserves therefore are "out-of-the-money" – reflecting a total cost to extract that cannot be recovered from market prices. As a result, no drilling would occur under current prices. In addition, any leases that might be sold would be at very low prices reflecting only the extrinsic value of the site associated with optionality, heavily discounted to reflect uncertainty and risk of long-term commitments, as opposed to any intrinsic value related to the reserves that might be technically recoverable.

H. Rising oil prices would support delaying lease sales

To the extent long-term oil prices are expected to recover, a possibility that runs counter to longer-term trends in lower-cost supply and softening demand, the auctions should be delayed. Moving forward with leasing the 1002 Area while market prices are below the estimated breakeven price will not generate the anticipated revenues. Instead, selling American energy assets at depressed prices will lock-up the ownership and opportunities associated with those assets for the term of the lease.

In effect, the U.S. federal government would be giving up optionality associated with the 1002 Area reserves. Given where market prices for oil currently are, therefore, it would make economic sense to delay the auctions until such time—if indeed that time ever comes—when global oil prices at least cover the estimated breakeven price of extracting oil from the 1002 Area. Moving forward at current prices would minimize potential revenue gains and effectively give away development rights to the 1002 Area oil assets.

I. Key points about ANWR

The estimated cost to extract oil from the 1002 Area is highly uncertain. That said, the following is known:

- **"Out-of-the-money":** Oil reserves in the 1002 Area that are technically recoverable are more expensive to develop than current market prices; projected prices indicate that market prices are likely to continue to be lower than the breakeven price through the early 2020s.

- **Uncompetitive Resources:** ANWR oil reserves are among the most expensive opportunities in the industry, and will be much more expensive to develop than shale oil which is being produced in the lower-48 states.

- **Low Bids with High Discounts:** Any bids tied to leasing the sites may reflect only the option value of the site with significant discounts reflecting uncertainty surrounding volumes and costs to extract and bring to market.

- **Delay Optimizes Revenues:** Given that current market prices are lower than the cost to develop the 1002 Area reserves, it would make economic sense to delay the auctions.

Therefore, proceeding with the lease auctions under current market conditions is not likely to

optimize lease revenues, and could simply serve to lock up assets with no potential production and associated revenue in the future.

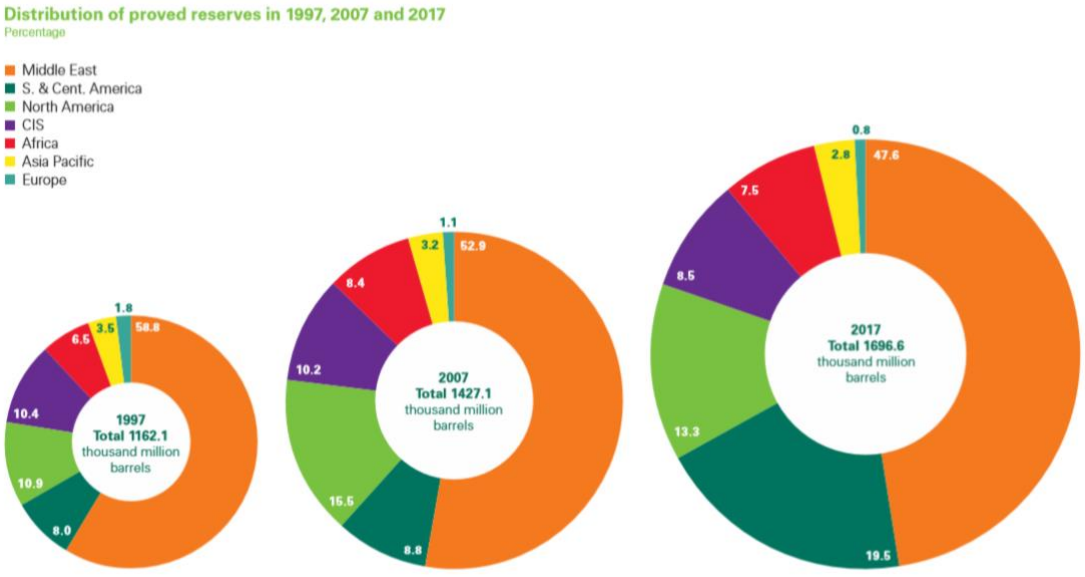
- GLOBAL OIL MARKET

Oil is a global commodity that is shipped from oil-producing states to purchasers around the world. In accordance with basic economics, prices are driven by supply and demand. A critical part of price drivers are geo-political events that can dramatically impact supply, including decisions to withhold or produce oil by the Organization of the Petroleum Exporting Countries ("OPEC"). OPEC countries control 82 percent of all oil reserves,[54] giving this block of countries the opportunity to exercise monopoly power through coordinated efforts to establish production quotas to control prices. This section describes the factors that drive oil prices in order to explain the context behind recent impacts of shale technology on supply (**Section** □) and projected impacts of automobile technology and business models on demand (**Section** □).

- Supply is concentrated

Proven reserves span the world with a substantial amount of conventional oil reserves located in the Middle East, although the relative share has been declining over the past two decades (**Figure 7**).

Figure 7: Location and Size of Proved Oil Reserves Over Time[55]



[54] Organization of the Petroleum Exporting Countries (OPEC), "OPEC share of world crude oil reserves, 2017," 2019, https://www.opec.org/opec_web/en/data_graphs/330.htm

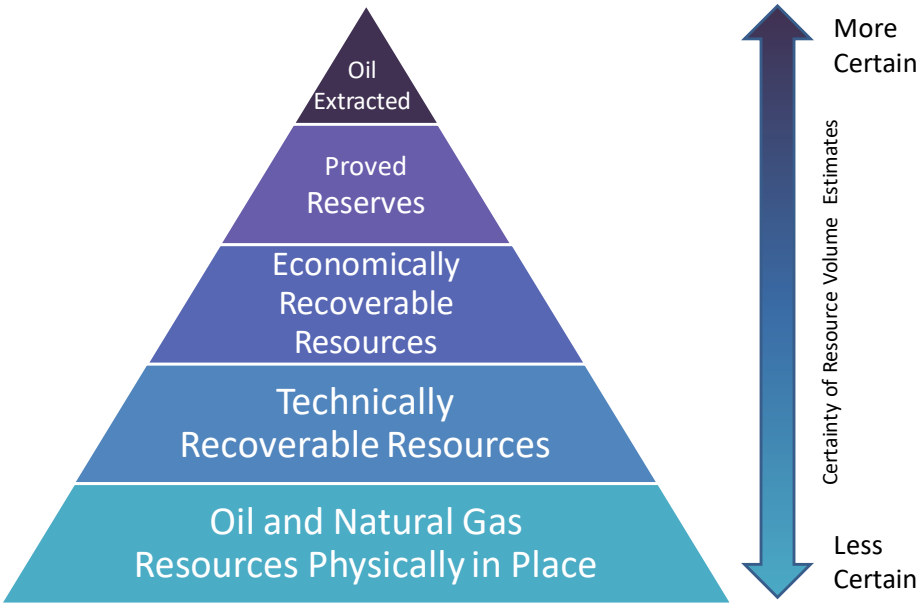
[55] BP, "Statistical Review of World Energy 2018," June 2018, 67th Edition, p. 13, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2018-full-report.pdf

Proved reserves in both North America (primarily Canada due to oil sands) and South America (primarily Venezuela) have increased the total amount of proved reserves along with the market share of the Americas. Although each country's value reflects estimation methods and system charges that may make direct comparisons to each other inconsistent, a relative comparison of oil reserves as by region indicates that the source of supply is growing and diversifying.[56]

Total proved oil reserves only tell a limited snapshot of the story and are a limited measure of total potential volumes. The estimated amount of proved oil reserves a country may have at any given time can change. Key factors that impact estimated reserves include changes in technology, market conditions and production. For purposes of calculating proved reserves, current prices, as measured by the past twelve months, for example, tend to be used.

Most other measures of reserves reflect an estimate of oil and natural gas volumes that might be produced in the future, with future conditions being key. Other types of reserves estimates are therefore based on both facts and projections. As a result, reserves generally are grouped into categories based on the degree of their certainty and likelihood of extraction in the future (**Figure 8**).

Figure 8: Relationship of Different Measures of Oil Reserves[57]



Each of these four categories are described below[58]

[56] U.S. Energy Information Administration, "International Energy Statistics," 2019, https://www.eia.gov/beta/international/data/browser/
[57] Energyzt representation of different measures of reserve volumes.
[58] U.S. EIA, https://www.eia.gov/todayinenergy/detail.php?id=17151 See also:

1) **Proved Reserves:** This category is the most restrictive and reflects the most factual estimate of oil and gas that is available to a country under current economic conditions and technology given the geological formations already known and measured. In addition to changes in market and technological conditions, the amount of proved reserves is reduced by the volumes extracted. There is reasonable certainty that the energy resources will be recoverable in future years. In the U.S., company estimates of reserves provided by publicly-traded companies are defined and regulated; estimates by other countries may not match the same definitions or level of certainty.

2) **Economically Recoverable Resources:** This category expands proven reserves to include additional plays that may not be currently producing, but are economically recoverable. The volume of economically recoverable oil rises and falls with prices. There is an inverse relationship with capital and operating costs whereby higher costs reduce economically recoverable resources.

3) **Technically Recoverable Reserves:** This broader category of oil and gas resources reflects the amounts that can be extracted based on current technology, processes, and geological knowledge, regardless of oil prices and costs. As innovation and information expands, so too can the measure of technically recoverable resources. U.S. government agencies tend to report technically recoverable resources instead of economically recoverable resources because it is easier to compare to estimates made by other countries versus economically recoverable resources which may be based on fluctuating estimates of price and costs.

4) **Remaining Oil and Gas in Place:** The broadest category reflects the total volume of oil and gas in place before the start of production less what already has been extracted. This is the most uncertain of the categories in that it could include stranded assets that may never be recovered unless technology and prices reach a level that makes these reserves technically and economically feasible.

It is important to reiterate the impact of changing prices on estimates of measurable reserves. Although a change in price would not impact the actual physical oil in the ground (i.e., the remaining oil in place or technically recoverable resources), a sustained reduction in prices could result in stranded assets. Furthermore, the economically recoverable resources and proved reserves would have to be reduced, potentially with an impairment value calculated using SEC

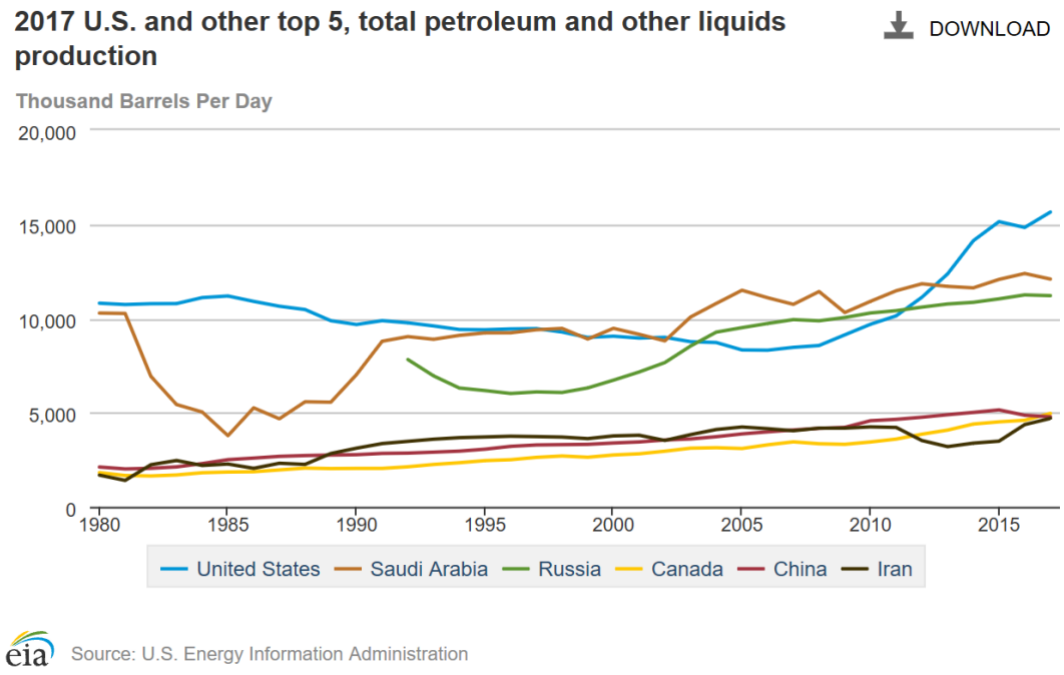
2011 guidelines issued by the Society of Petroleum Engineers, https://www.spe.org/industry/docs/PRMS_Guidelines_Nov2011.pdf
The United Nations guidance on measuring energy reserves, http://www.unece.org/fileadmin/DAM/ie/se/pdfs/UNFC/UNFCemr.pdf

regulated formulas.[59] Therefore, actual and projected prices are an important input to company and country calculations of proved reserves and economically recoverable resources, making comparison across estimates potentially misleading without proper understanding of what those values represent. It also is critical to understand which metric is being used when estimated volumes of reserves are presented.

Furthermore, the physical amount of oil is constantly changing as new pools and plays are discovered. For the past thirty years, total oil reserves have been increasing as new volumes were discovered, prices increased, and technology costs fell. Canada became a top player of proved reserves once oil sands were incorporated into the estimate, followed by Venezuela's Orinoco discovery. At this point, U.S. reserves of unconventional oil have not been fully incorporated into country-wide estimates of proved reserves. Once they are, however, there will be a complete reconfiguration of where proved reserves are located (see **Section □o**).

Another way to examine the location of supply is through production, which presents a more factual basis for understanding what different countries can and are producing. Although the U.S. may not be among the top ten for proven reserves of conventional oil, the U.S. has been one of the top three producers of oil over the past forty years (**Figure 9**).

Figure 9: Annual Oil Production by Major Countries[60]



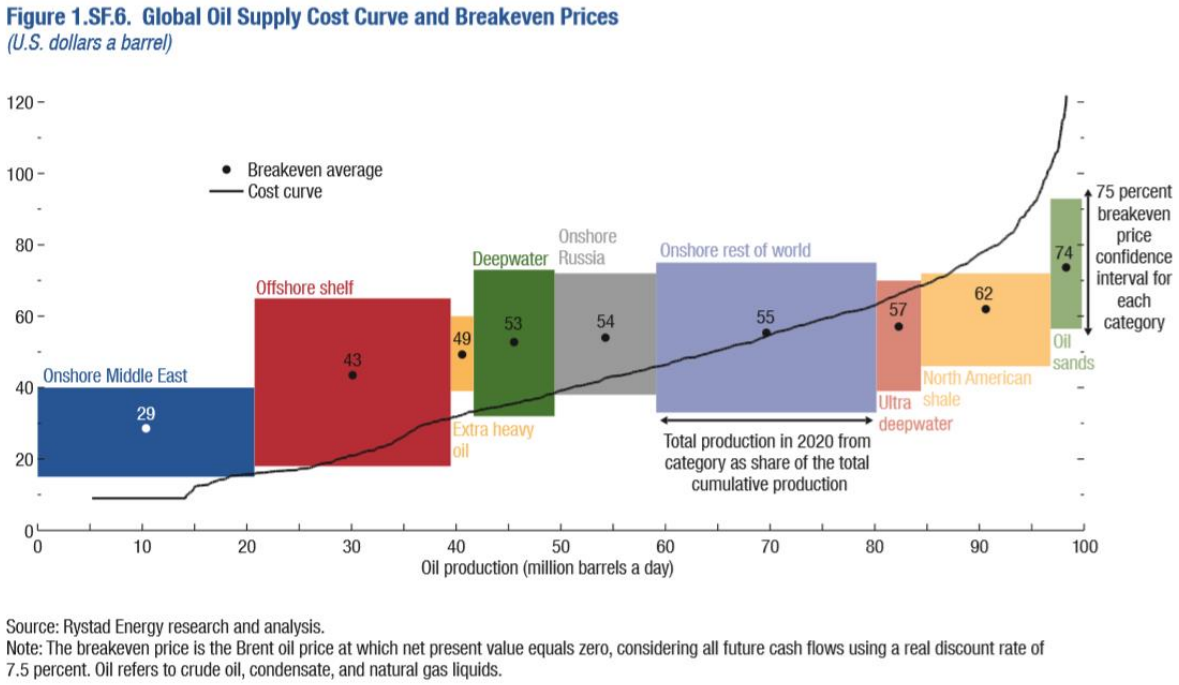
Global oil supply curves that can be used to derive prices also use actual production levels, as opposed to reserves. Combined with marginal costs of production, such supply curves

[59] For example, a number of oil companies had to take impairment charges for their Canadian oil sands investments in 2015 and 2016 when lower prices from the 2014 price crash were sustained for more than a year.
[60] US EIA, https://www.eia.gov/beta/international/?view=consumption

provide insight into potential impacts of new supply or demand on prices.

Figure 10 plots production levels from key regions against estimates of their marginal cost of production. The height of the block represents a 75 percent confidence interval for the breakeven cost of production in each region; the width represents actual oil production on a daily basis (measured in million barrels per day). The large set of blocks in the middle ranging from 40 to 95 million barrels per day indicate a relatively large expanse of production with prices ranging from $40 to $80 per barrel. Global demand for oil in 2017 reached 98.5 million barrels of oil per day, which is projected to rise to above 100 million barrels per day in 2019.[61]

Figure 10: Global Oil Supply Curve[62]



Source: Rystad Energy research and analysis.
Note: The breakeven price is the Brent oil price at which net present value equals zero, considering all future cash flows using a real discount rate of 7.5 percent. Oil refers to crude oil, condensate, and natural gas liquids.

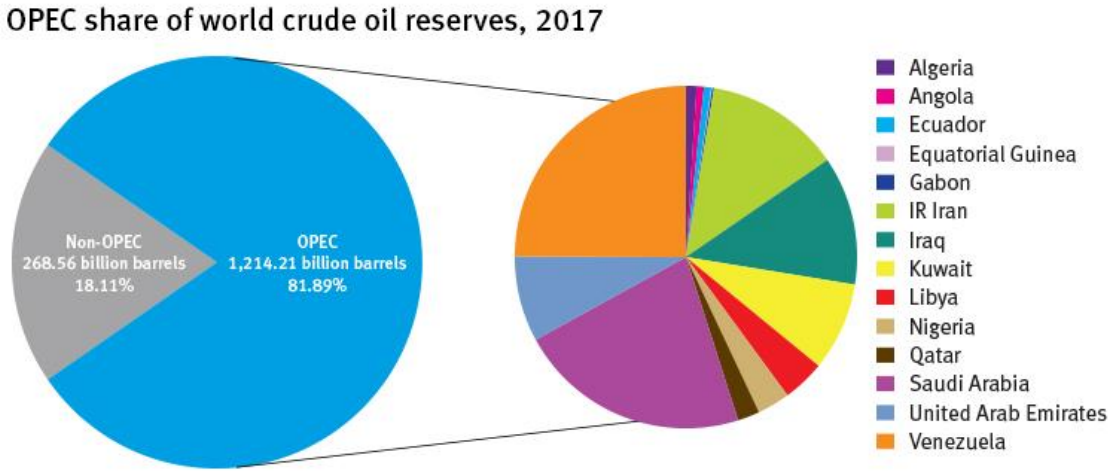
Rising demand for oil in 2018 prompted multiple pundits to call for price spikes above $100 per barrel by the end of 2018.[63] Instead, global economic growth softened, and prices for Brent Crude fell to almost $50 per barrel, corresponding to onshore production.[64] In addition, North American shale has been gaining market share and serving as swing supply to set the price for oil.

[61] U.S. Energy Information Administration, "Short-Term Energy Outlook," February 12, 2019, https://www.eia.gov/outlooks/steo/report/global_oil.php
[40] International Monetary Fund, "World Energy Outlook," Chapter 1, 2017, p. 60, https://www.imf.org/en/Publications/WEO/Issues/2017/04/04/world-economic-outlook-april-2017#Chapter 1
[63] Ashton, Gary, "Crude Oil Price Forecast: $100 All the Rage," Investopedia, September 30, 2018, https://www.investopedia.com/investing/crude-oil-price-forecast-100-all-rage/
[64] NASDAQ, https://www.nasdaq.com/markets/crude-oil-brent.aspx

The combination of the supply curve and recent price experience illustrates that oil markets currently are operating on the steep part of the supply curve. Small changes can have a big impact (e.g., price projections ranging from $100 per barrel to $50 per barrel within a few months). As shale supply increases, and demand is impacted by new technologies, supply and demand could settle in at the flatter part of the supply curve, which would minimize the price impact of small changes in supply.

For the time being, OPEC continues to play a key role in setting oil prices. Representing more than 80 percent of oil reserves, the majority of OPEC member countries are located in the Middle East (**Figure 11**). The addition of Venezuela has only strengthened OPEC's price-setting capabilities; recent alliances with Russia make it even stronger.

Figure 11: OPEC Share of Oil Reserves as of 2017[65]



OPEC proven crude oil reserves , at end 2017 *(billion barrels, OPEC share)*

Venezuela	302,81	24,9%	Kuwait	101,50	8,4%	Qatar	25,24	2,1%	Gabon	2,00	0,2%
Saudi Arabia	266,26	21,9%	UAE	97,80	8,1%	Algeria	12,20	1,0%	Equat. Guinea	1,10	0,1%
IR Iran	155,60	12,8%	Libya	48,36	4,0%	Angola	8,38	0,7%			
Iraq	147,22	12,1%	Nigeria	37,45	3,1%	Ecuador	8,27	0,7%			

Source: OPEC Annual Statistical Bulletin 2018.

Representing such a significant block of supply, combined with the dominance of Saudi Arabia who single-handedly can serve as swing supply to punish defectors,[66] has allowed OPEC to set the price of oil at levels it targets since the 1970s. That said, there are a number of factors that have raised increasing challenges to OPEC's control over the past decade, including escalating demand from Asian countries and the increase in shale oil supply from non-OPEC countries.

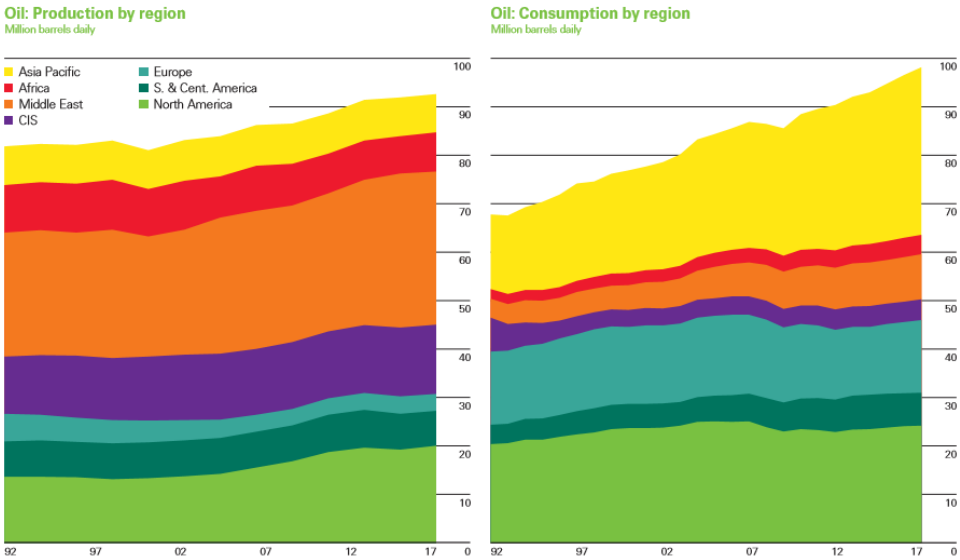
[40] OPEC, https://www.opec.org/opec_web/en/data_graphs/330.htm

[66] The ability to punish defectors is a critical aspect of OPEC's success along with repeated cooperation opportunities. Without these two factors, game theory would predict that the alliance would fall apart as individual countries choose to "cheat" and produce higher output than their quotas allow.

○ Demand growth faces policy challenges

In contrast to supply for conventional oil which is concentrated in Venezuela and the OPEC countries in the Middle East, demand for oil and oil products is heavily concentrated among developed countries. The largest consumers of oil and oil products are the developed countries, led by the United States and Europe (**Figure 12**).

Figure 12: Oil Consumption by Region (Million Barrels per Day)[67]

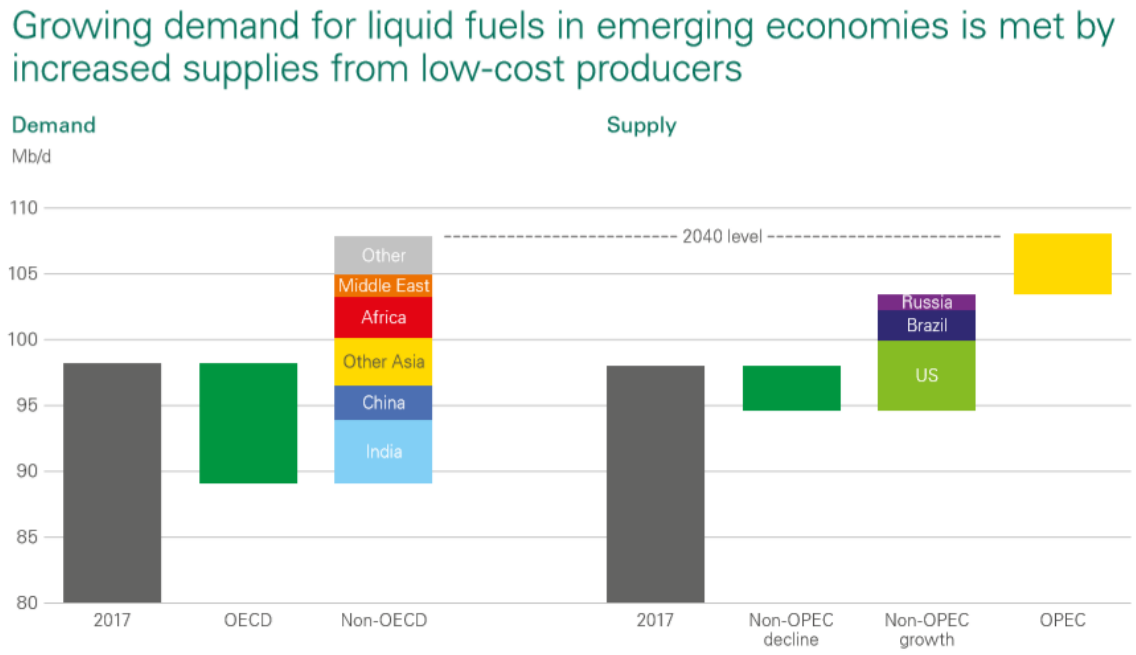


World oil production rose by only 0.6 million b/d in 2017, below average for the second consecutive year. Production fell in the Middle East (-250,000 b/d) and South & Central America (-240,000 Kb/d) but this was outweighed by growth from North America (820,000 b/d) and Africa (390,000 b/d). Global oil consumption growth averaged 1.7 million b/d, above its 10-year average of 1.1 million b/d for the third consecutive year. China (500,000 b/d) and the US (190,000 b/d) were the single largest contributors to growth.

The largest driver of growth in demand, however, is projected to come from developing countries, including China and India.[68] For example, BP projects that demand for liquid fuels (e.g., fuel oil, diesel, petrol and kerosene) will decline in developed countries while demand in developing countries is projected to grow; supply is expected to be met by increased production from the U.S. and OPEC countries (**Figure 13**).

[67] BP, "Statistical Review of World Energy 2018," p. 18.
[68] International Energy Agency, "Oil 2018," March 5, 2018, https://www.iea.org/oil2018/

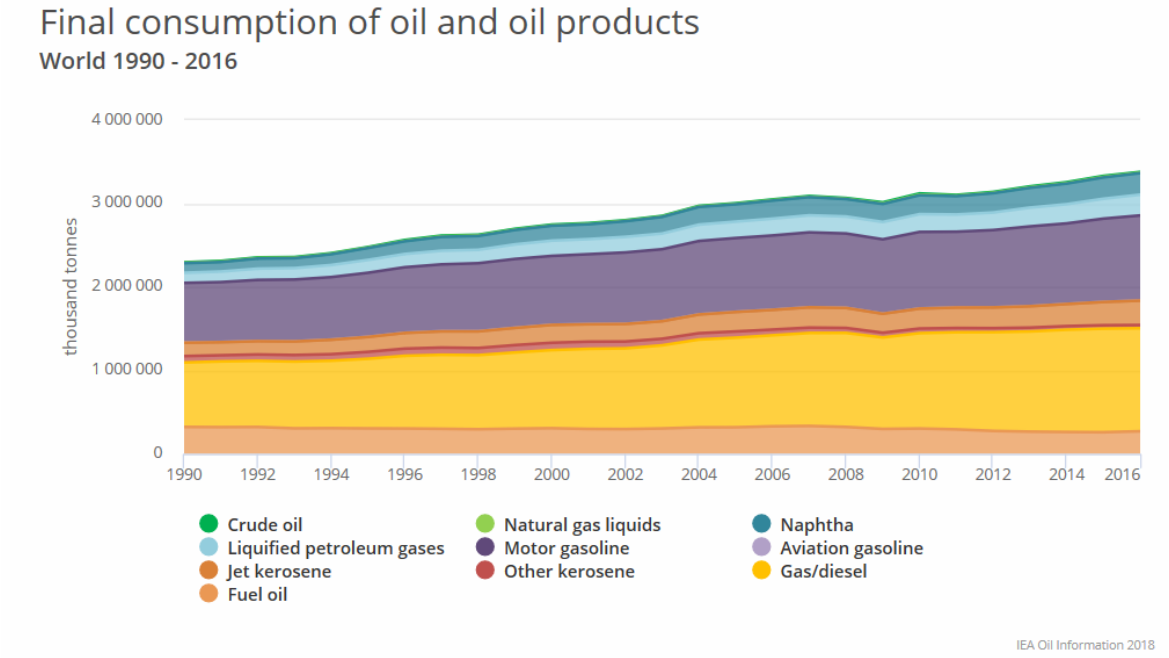
Figure 13: Projected Growth in Demand for Liquid Fuels[69]



Oil and oil products are consumed for a number of purposes. The largest component is for gasoline or diesel transportation, followed by aviation fuel. In 2016, roughly two-thirds of consumption was for transportation; the second largest use is for non-energy purposes such as feedstock and other manufacturing inputs (**Figure 14**).

[69] BP Energy Outlook, 2019 edition, p. 81, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2019.pdf

Figure 14: Final Consumption of Petroleum Products[70]



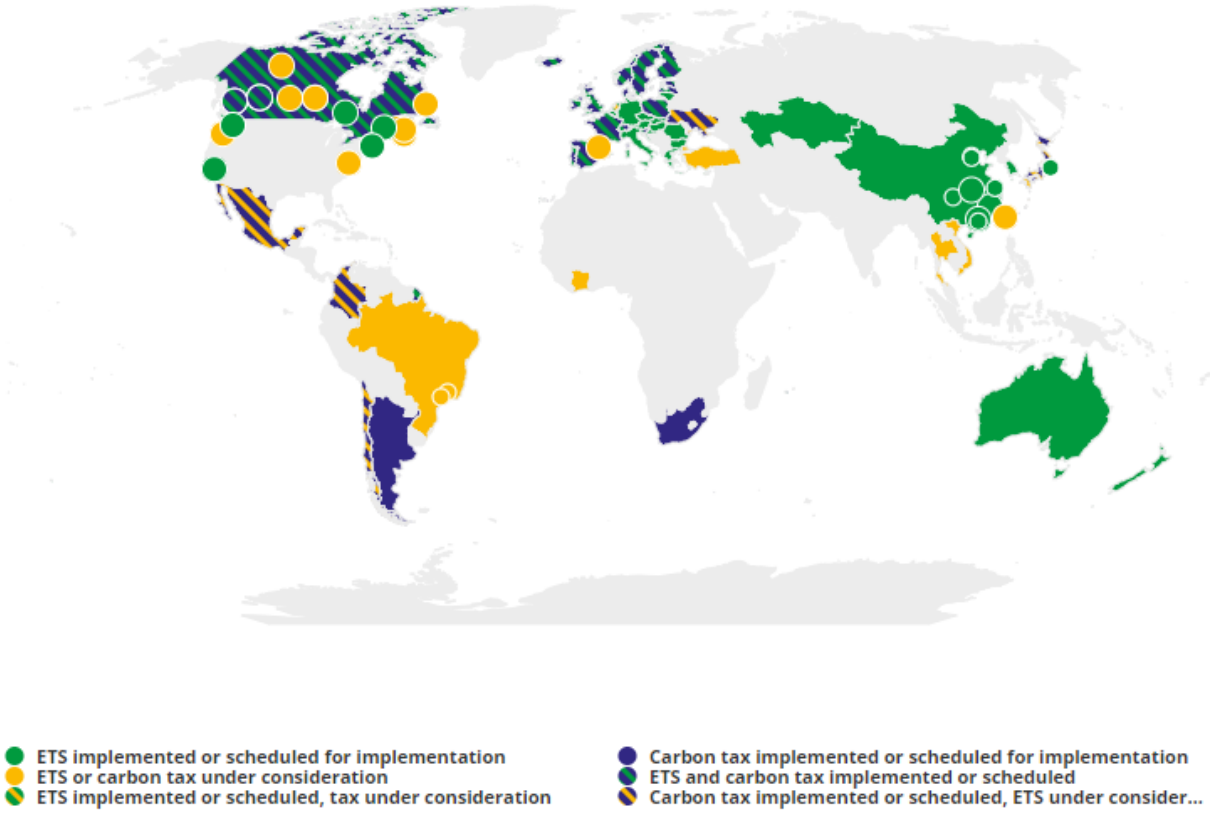
One of the limiting growth factors in developed, as well as developing, countries is the focus on decarbonization. Policies, laws and economic support are being provided on the local levels as well as by countries. According to the World Bank,[71] over 40 countries and 20 cities have implemented some form of carbon pricing (**Figure 15**). These policy initiatives cover roughly half of their carbon emissions – about 13 percent of annual global greenhouse gas emissions.[72]

[70] International Energy Agency, "Statistics: Global Energy Data at your Fingertips," https://www.iea.org/statistics/?country=WORLD&year=2016&category=Oil&indicator=OilProductsCons&mode=chart&dataTable=OIL

[71] World Bank, "Pricing Carbon," http://www.worldbank.org/en/programs/pricing-carbon

[72] *Ibid.*

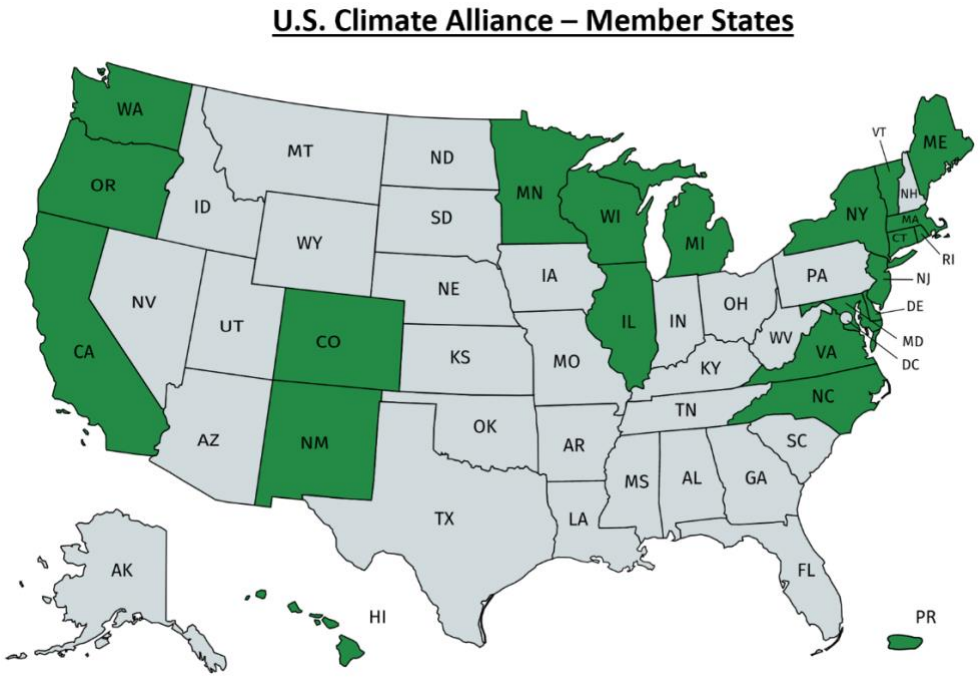
Figure 15: Map of Regional, National and Subnational Carbon Pricing Initiatives[73]



Individual states in the U.S. are included in this count. Following the Trump Administration's withdrawal from the Paris Agreement, a number of states vowed to uphold the agreement.[74] The United States Climate Alliance ("Alliance") member states agree to implement policies that advance the Paris Agreement, and aim to reduce greenhouse gas emissions by at least 26 to 28 percent below 2005 levels by 2025.[75] Currently, 21 states plus Puerto Rico are members of the Alliance (**Figure 16**).

[73] World Bank, "Carbon Pricing Dashboard," https://carbonpricingdashboard.worldbank.org/
[74] Garfield, Leanna and Gould, Skye, "This map shows which states are vowing to defy Trump and uphold the US' Paris Agreement goals," *Business Insider*, June 9, 2017, https://www.businessinsider.com/us-states-uphold-paris-agreement-2017-6
[75] United States Climate Alliance, https://www.usclimatealliance.org/alliance-principles

Figure 16: Member States of the U.S. Climate Alliance (Green States)[76]



Many states are going beyond the Alliance goals. For example, the six New England states currently participate in the Regional Greenhouse Gas Initiative and have targeted an 80 percent reduction in 1990 levels of carbon emissions by 2050.[77] In December 2018, Massachusetts and eight other Northeast and Mid-Atlantic states, plus the District of Columbia, released an agreement to develop a framework for a regional program to reduce transportation sector greenhouse gas emissions.[78] The New York Green New Deal announced by Andrew Cuomo in January 2019 targets a net zero carbon emissions economy,[79] as do similar plans in California and Hawaii.[80] The Governor of Minnesota also has presented a plan for 100 percent carbon-free electricity by 2050.[81]

In addition, large investors, led by many of the proactive state pension funds, are calling for utilities to go zero carbon by 2050.[82] The effort by investors to understand company and

[76] World Bank, "Carbon Pricing Dashboard."
[77] RGGI, Inc., https://www.rggi.org/; ISO-NE, 2018 Regional Energy Outlook, February 2018, p. 28, https://www.iso-ne.com/static-assets/documents/2018/02/2018_reo.pdf
[78] Massachusetts Executive Office of Energy and Environmental Affairs, December 18, 2018, https://www.mass.gov/news/commonwealth-joins-regional-states-to-reduce-transportation-emissions
[79] Cuomo, Andrew M., "2019 Justice Agenda: The Time is Now," https://votesolar.org/files/7415/4758/4798/SoS_Briefing_Book_2019.pdf
[80] Penn, Ivan, "California Lawmakers Set Goal for Carbon-Free Energy by 2045," *The New York Times*, August 28, 2018, https://www.nytimes.com/2018/08/28/business/energy-environment/california-clean-energy.html
[81] Austin, Paul, "Press Release: One Minnesota Path to 100% Clean Energy is Bold and Pragmatic," *Conservation Minnesota*, https://www.conservationminnesota.org/news/interests/energy-climate-and-transportation/press-release-one-minnesota-path-to-100-clean-energy-is-bold-and-pragmatic/
[82] Kerber, Ross, "Big U.S. Pension Funds Ask Electric Utilities for Decarbonization Plans," US News, February 28,

investment risks tied to carbon emissions has increased over the past decade. Oil companies such as Exxon increasingly are facing investor proposals to set targets for carbon emissions and increase disclosure of environmental risks.[83]

Placing a price on carbon is an efficient way to accomplish the objective of reducing the environmental impact associated with carbon emissions. In the fall of 2018, a United Nations scientific panel stated that pricing carbon dioxide emissions is key to reducing carbon emissions and controlling global warming.[84] In January 2019, a number of Nobel Prize winning economists, former Chairs of the Federal Reserve, former Chairs of the Council of Economic Advisors, Secretaries of the U.S. Department of Treasury and other illustrious signatories signed the "Economists' Statement on Carbon Dividends," advocating for putting a tax on carbon and distributing the dividends back to tax payers for investment in the form of equal lump-sum rebates.[85]

Such policy programs that target carbon are expected to continue to expand and will have to target transportation emissions if meaningful reductions are to be realized. In the U.S., transportation accounts for around one-third of total carbon emissions (**Figure 17**). A carbon tax can help to incentivize the transition away from high carbon emitting transportation resources by making internal combustion engines less competitive than electric vehicles, motivating higher energy efficiency transportation technology, and shifting travel decisions away from high carbon intensity modes of travel. The price signal also would allow the market to find and/or create the most cost-effective alternatives.

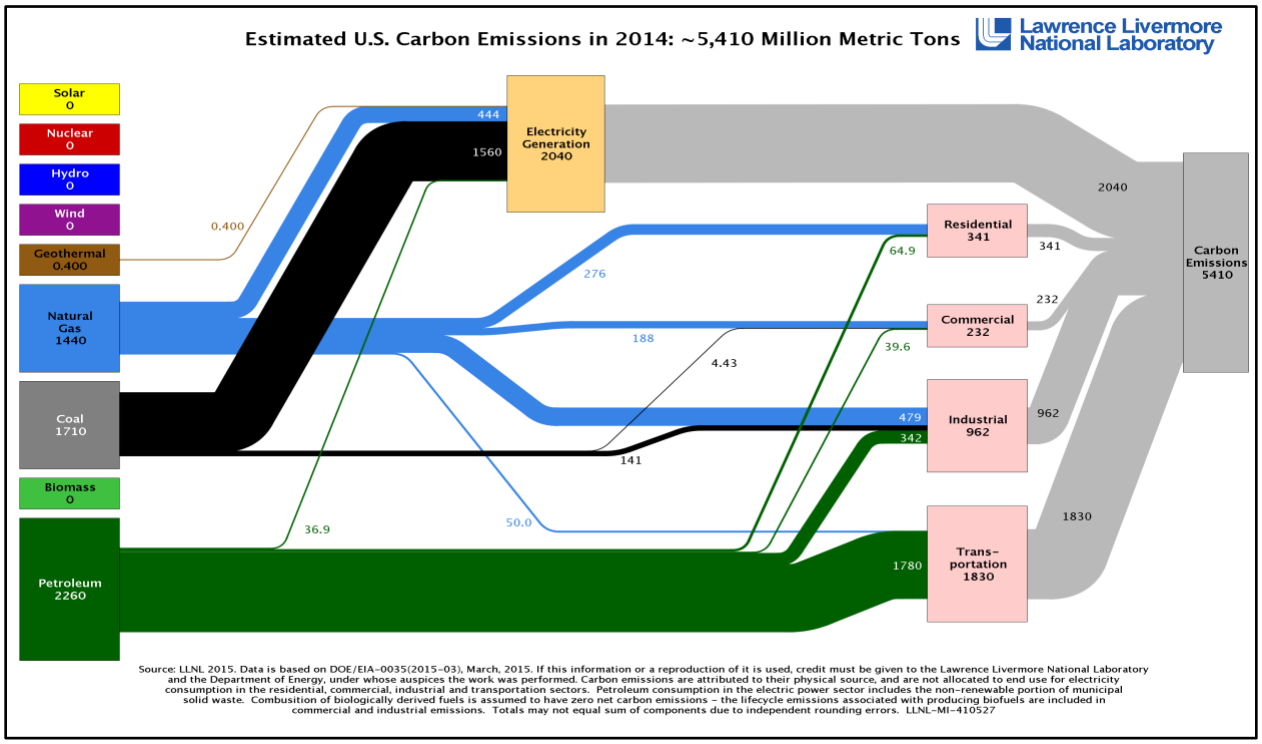
2019, https://www.usnews.com/news/top-news/articles/2019-02-28/big-us-pension-funds-ask-electric-utilities-for-decarbonization-plans

[83] Crooks, Ed, "Exxon seeks to block vote on investor proposal on emissions," *Financial Times*, February 24, 2019, https://www.ft.com/content/800fb008-3853-11e9-b72b-2c7f526ca5d0

[84] Plumer, Brad, "New U.N. Climate Report Says Put a High Price on Carbon," *The New York Times*, October 8, 2018, https://www.nytimes.com/2018/10/08/climate/carbon-tax-united-nations-report-nordhaus.html

[85] "Economist's Statement on Carbon Dividends," https://www.econstatement.org/

Figure 17: Source of Carbon Emissions in the U.S.[86]



- Oil prices are low but volatile

Although there are roughly 160 different types of oil that vary in terms of weight, viscosity and chemical composition (e.g., sulfur content), markets generally trade around two price indices for futures (i.e., Brent Crude oil and Western Texas Intermediate ("WTI")).[87] Both indices are traded on the New York Mercantile Exchange (NYMEX) and the Intercontinental Exchange (ICE), and reported by the Chicago Mercantile Exchange. Prices reflect global and domestic supply and demand conditions, described in more detail below. Wellhead prices also are available, with the most relevant for ANWR being the North Slope First Purchase Price, which is highly correlated with both Brent and WTI, differing by the transportation cost required to bring the oil to market.

With a large market in Western Europe, Brent Crude is an international index for oil prices. Brent Crude is sourced from the North Sea and oil production coming from Europe, Africa and western flows from the Middle East are priced relative to this oil. Brent Crude is ideal for making gasoline and middle distillates and is used to price about two-thirds of the internationally-traded crude oil supplies in the world. As of early March 2019, Brent Crude was trading over the counter at around $65 per barrel. Prices have traded as low as $2.23 per barrel

[86] Lawrence Livermore National Laboratory, https://flowcharts.llnl.gov/commodities/carbon
[87] Other important oil price indices include the Dubai Crude, Oman Crude, Urals oil and the OPEC Reference Basket.

in 1970 to a high of $145.61 per barrel in 2008.[88]

The U.S. tends to rely predominantly on WTI, although the U.S. also requires heavier crude for certain applications. WTI is known as "Texas light sweet," a grade of crude oil described as "light" because of it relatively low density and "sweet" because of low sulfur content. Prices have ranged from $1.42 per barrel in 1946 to $145.31 in 2008. Although WTI and Brent Crude tend to track each other, discrepancies can occur due to chemical content, physical constraints such as limitations on refinery capacity and global supply or transportation disruptions. Most recently, WTI has been trading lower then Brent Crude and is currently at around $55 per barrel.

The relationship between North Slope wellhead prices and the international and domestic indices tends to reflect the transportation cost required to bring North Slope prices to market. Therefore, a breakeven price at the wellhead in ANWR needs to be adjusted by at least $5 per barrel for comparison to Brent Crude, and by around $8 to $10 per barrel for comparison to WTI.[89]

Oil prices tend to be very responsive to geo-political events due to their anticipated impact on supply and demand. When political conflict breaks out in the Middle East or other oil-producing regions, oil prices can spike. Similar, softening of global projections for demand due to economic recessions or financial crises tend to cause oil prices to fall. The correlation between Brent Crude prices and the North Slope means that global events impact prices at which oil from Alaska can be sold. **Figure 18** illustrates how historical oil prices at the North Slope in Alaska, adjusted for inflation, have been impacted by events over the past fifty years.

[88] Trading Economics, https://tradingeconomics.com/commodity/brent-crude-oil
[89] Based on Energyzt analysis of historical North Slope prices to Brent and WTI.

Figure 18: Relationship of North Slope Oil Prices to Geo-political Events[90]

After hitting a high approaching $150 per barrel in 2008, oil prices fell to around $40 per barrel as a result of the global financial collapse and then rose to above $100 per barrel as a result of OPEC production cuts. Prices crashed at the end of 2014 to below $30 per barrel due to excess supply and softening demand. Although oil prices are recovering, they remain well below peak prices.

Short-term forecasts by the EIA and others anticipate that these low oil price trends will continue through the mid-2020s. Thereafter, under the assumption of increasing global demand for oil, the EIA projection in its AEO 2019 Reference Case increases to above $100 ($2018) per barrel by 2040.[91] It is clear, however, that the EIA projections are tied to conservative projections of the adoption of electric vehicles with minimal incorporation of how other technologies will contribute to electric vehicle adoption rates (**Section □o**).

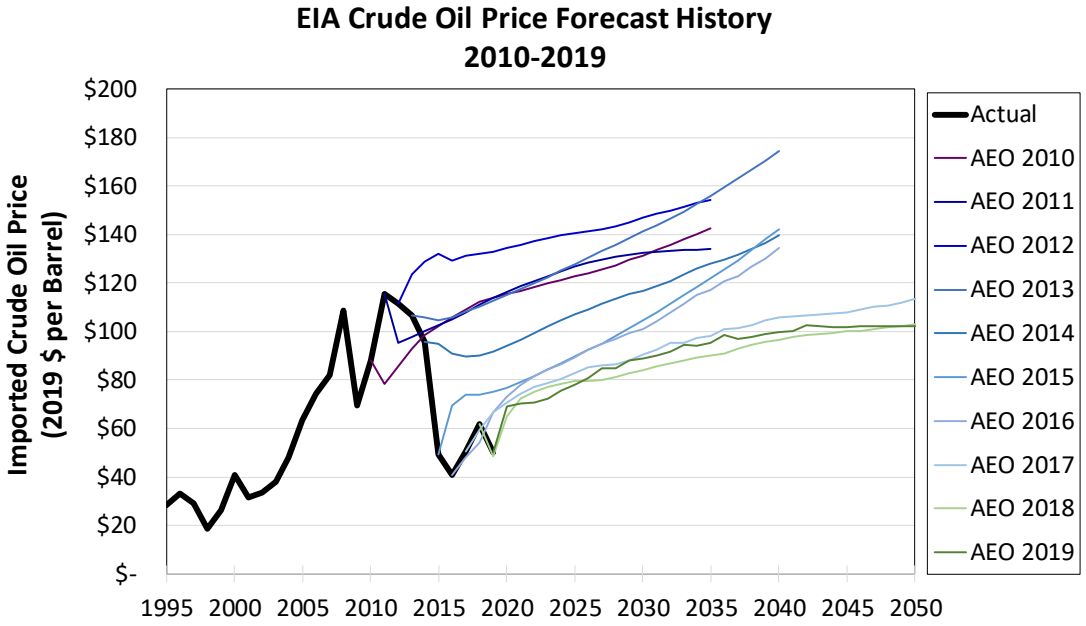
Furthermore, there are inherent limitations to the EIA price projections that have resulted in a history of underestimating the impact of extant trends, especially in light of new technology

[90] Energyzt Analysis of US EIA, North Slope First Purchase Price adjusted for inflation using the Consumer Price Index to $2019; events identified by the U.S. EIA and historical review, "North Slope First Purchase Price," https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=F005071__3&f=M

[91] In the High Oil Price case, the price of Brent crude oil, in 2018 dollars, is projected to reach $212 per barrel by 2050 compared with $108 per barrel in the Reference Case and $50 per barrel in the Low Oil Price case. U.S. EIA, AEO 2019, p. 33.

such as horizontal drilling and shale production (**Figure 19**).[92] Therefore, such long-term forecasts, should be considered in context and compared to other projections and anticipated policies and events.

Figure 19: Actual Imported Crude Oil Prices vs. EIA Forecasts (2010 – 2019)[93]



As will be discussed in the next two sections, other forecasts that provide a high technology adoption rate project that oil prices will continue at current rates, with some anticipating a significant impact on the world oil regime. Even if a major disruption does not occur, incremental technological improvements in shale oil recovery costs will continue to put downward pressure on global oil prices. As a result, ANWR is not projected to be economic in the near-term and, under realistic expectations concerning incremental technological improvements, would not have economically recoverable reserves over the long-term.

- Key Points about global oil markets

Global oil markets are volatile and subject to geopolitical events as well as monopolistic whims that drive supply and demand conditions. OPEC, representing 80 percent of total proved oil reserves, has the ability to set the price based on supply production or cuts in response to demand. Keeping prices high, however, is only recently being held in check by the ability of non-OPEC countries such as the U.S. to produce shale oil at competitive prices. OPEC thus faces a dilemma of maintaining high oil prices at the risk of losing market share. Although Saudi Arabia, the country with the largest proved reserves of conventional oil, has been able to keep OPEC members in check

[92] As already mentioned, EIA price forecasts are required to assume current legislation as passed and are not able to incorporate anticipated policy changes.
[93] Energyzt analysis of U.S. EIA, Historical AEO Projections 1980 – 2019 oil price data versus EIA AEO price projections.

historically, the increasing diversity of reserves and flexibility of U.S. shale to operate as swing supply by responding to price signals may be eroding OPEC's monopoly power.

Demand is a key part of oil prices. With many developed countries moving towards reducing their carbon footprint, addressing carbon emissions from transportation will be key. As a result, demand from developed countries is projected to decline while global demand only increases due to higher consumption by developing countries such as China, India, Africa and the Middle East. This increasing demand is likely to be met by U.S. shale oil production, followed by increases in OPEC production, as described further in the next section. The mid-term challenge to the global oil regime ties to changes in energy consumption patterns and demand, described further in **Section** □.

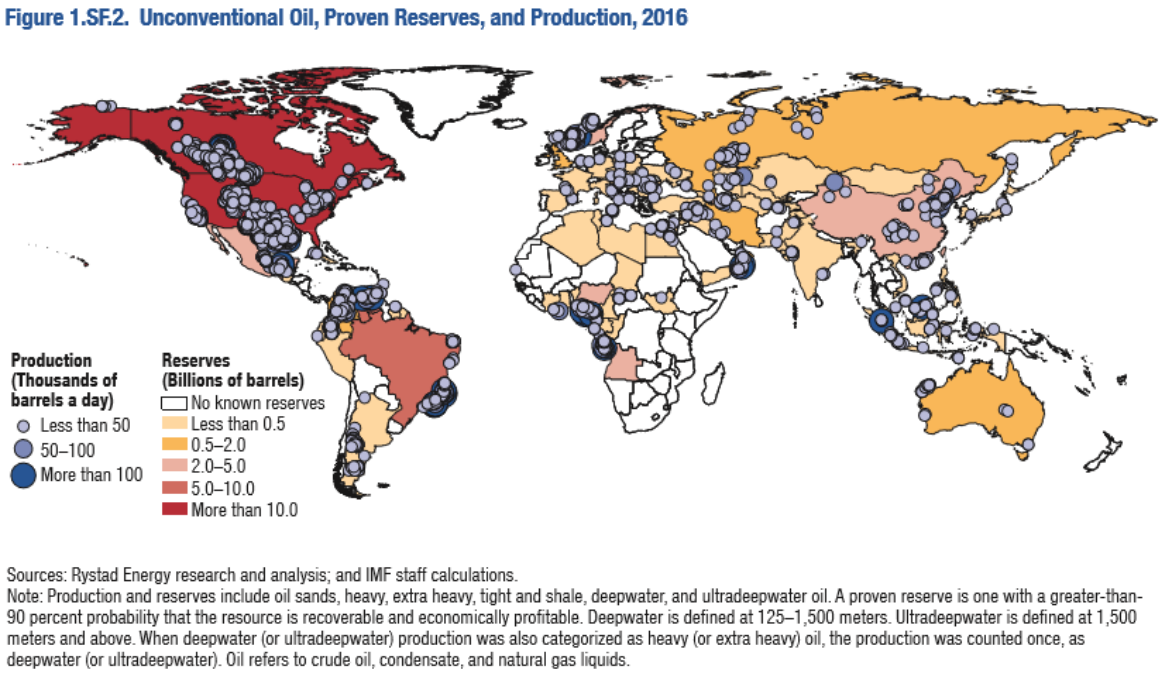
- IMPACT OF NEW TECHNOLOGIES ON SUPPLY

Technological improvements can increase both the amount of technically feasible reserves and lower the price at which those reserves are economic to extract. The past decade has experienced a significant change in the way oil is extracted in the U.S. and elsewhere. Unconventional oil drilling (i.e., technology used to extract shale oil) now dominates production in the U.S. The increase in reserves and production has served to mitigate OPEC's market power. In addition, lowering the costs of extraction make shale plays increasingly competitive against global supply, as well as ANWR. The net impact is an anticipation that the U.S. will be a net exporter of oil by 2020. Indeed, the EIA is using this as its reference case in its most recent projections.

- U.S. oil reserves are significantly higher due to shale

Although unconventional oil plays exist around the world, they are most significant in North America (**Figure 20**). In Canada, unconventional oil is predominantly associated with oil sands. In the U.S., unconventional oil tends to refer to tight and shale oil which generally is obtained via horizontal drilling.

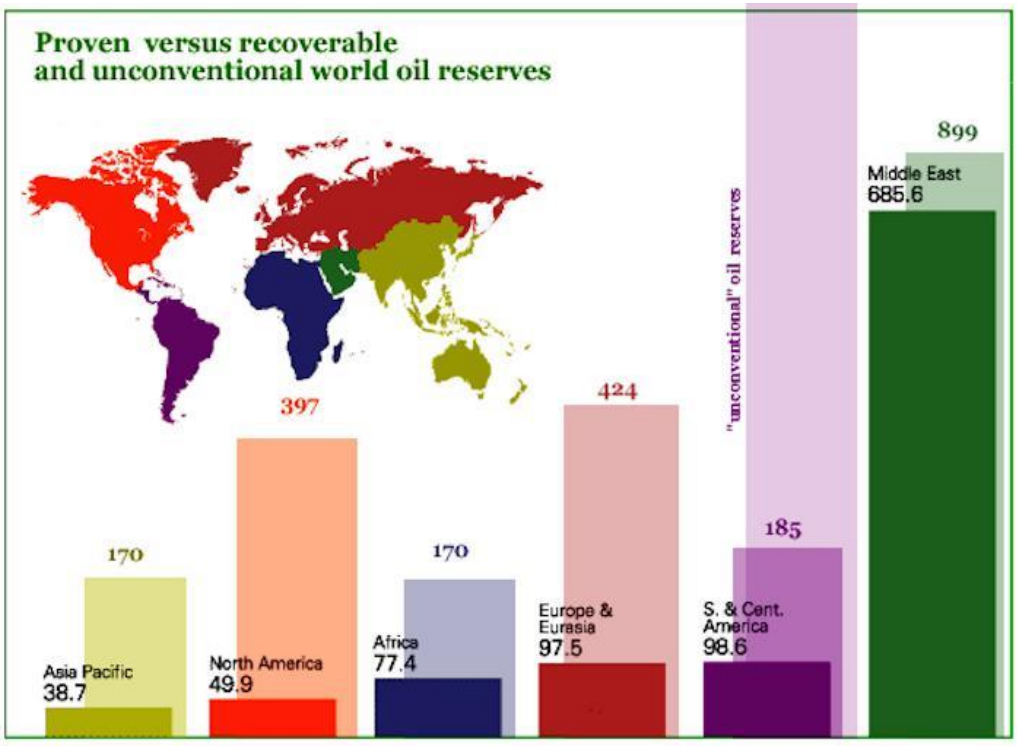
Figure 20: Location of Unconventional Oil Reserves and Production[94]



Estimated reserves tied to unconventional shale plays effectively turns the current oil regime on its head. Whereas supply currently is located in areas with relatively low demand for oil, unconventional reserves balance supply and demand geographically so that supply is located in the developed countries such as North America and Europe. Countries that had been net importers of oil, have the opportunity to become net exporters. North American reserves alone increase from 25 years of supply to 200 years when recoverable reserves using unconventional oil are taken into consideration (**Figure 21**).

[94] International Monetary Fund, "World Economic Outlook, April 2017: Gaining Momentum?" April 2017, p. 56, https://www.imf.org/en/Publications/WEO/Issues/2017/04/04/world-economic-outlook-april-2017#Chapter 1

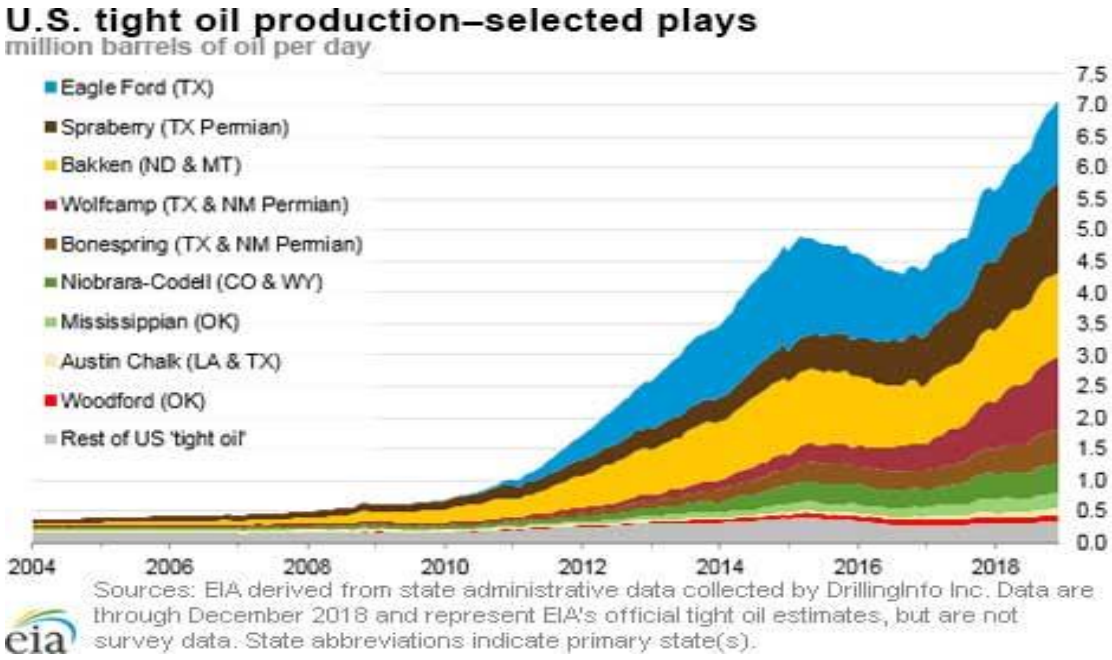
Figure 21: Oil Reserves by Region Adjusted for Unconventional Oil[95]



The impact already is being seen in U.S. oil production where horizontal rigs are replacing traditional vertical rigs.[96] Although the 2014 price crash initially caused a production decline, cost cuts and technological improvements quickly allowed volumes to recover. Whereas shale prices had been estimated at between $65 to $80 per barrel, current estimates range from $35 and $65 per barrel.[97] As a result, production continues to increase, despite lower oil prices (**Figure 22**).

[95] Conca, James, "US Winning Oil War Against Saudi Arabia," Forbes.com, 2015, https://www.forbes.com/sites/jamesconca/2015/07/22/u-s-winning-oil-war-against-saudi-arabia/#6cb08b911678
See also, Institute for Energy Research, https://www.instituteforenergyresearch.org/wp-content/uploads/2015/05/U.S.-Oil-Shale-Foreign-Oil-Reserve-Estimates-Mar-15.png
[96] Energyzt Analysis of Baker Hughes, "North America Rotary Rig Count," http://phx.corporate-ir.net/phoenix.zhtml?c=79687&p=irol-reportsothe r
[97] Bloomberg NEF, "Economics of U.S. Shale Oil Production," June 1, 2018, https://about.bnef.com/blog/economics-u-s-shale-oil-production

Figure 22: Production from U.S. Shale Plays[98]



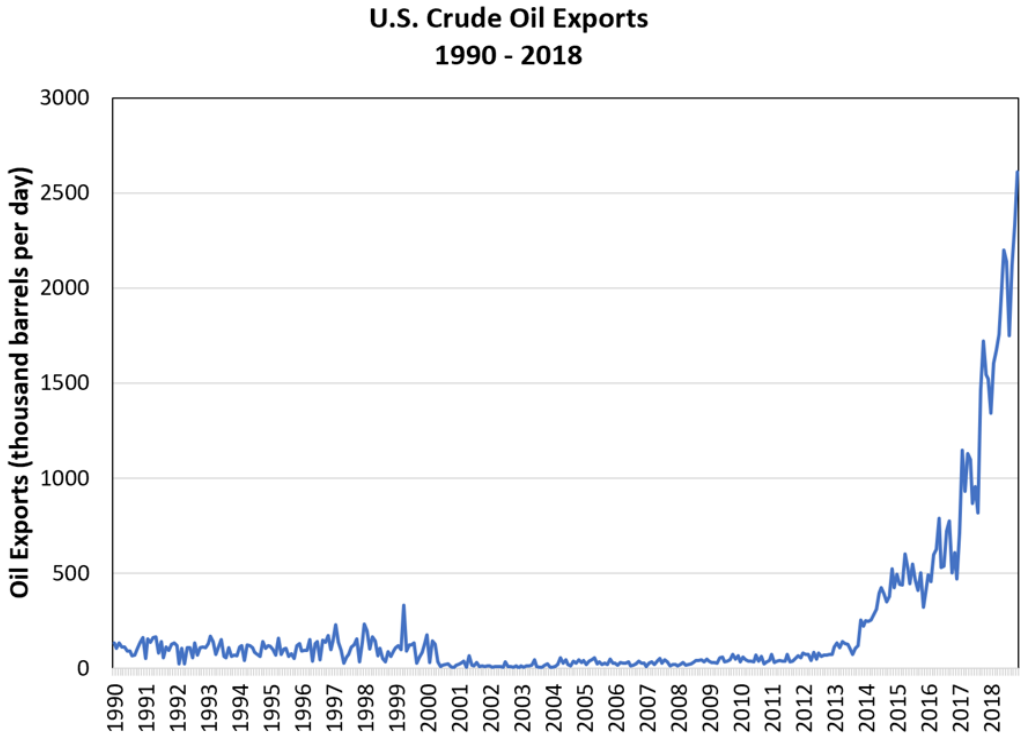
Increased output in the face of softening demand already is modifying the balance of trade between the U.S. and global markets, reversing a downward trend in U.S. oil production and decreasing reliance on foreign oil. As a result of growing exports, the role of the U.S. in global oil markets is changing.

- U.S. is projected to be a net exporter

With rising oil production domestically, the need for oil imports declines. Although the U.S. will continue to import at least some of the heavier crude from international markets, increased production from shale already has increased exports from the U.S. into other markets (**Figure 23**).

[98] US EIA, https://www.eia.gov/energyexplained/index.php?page=oil_where#tab2

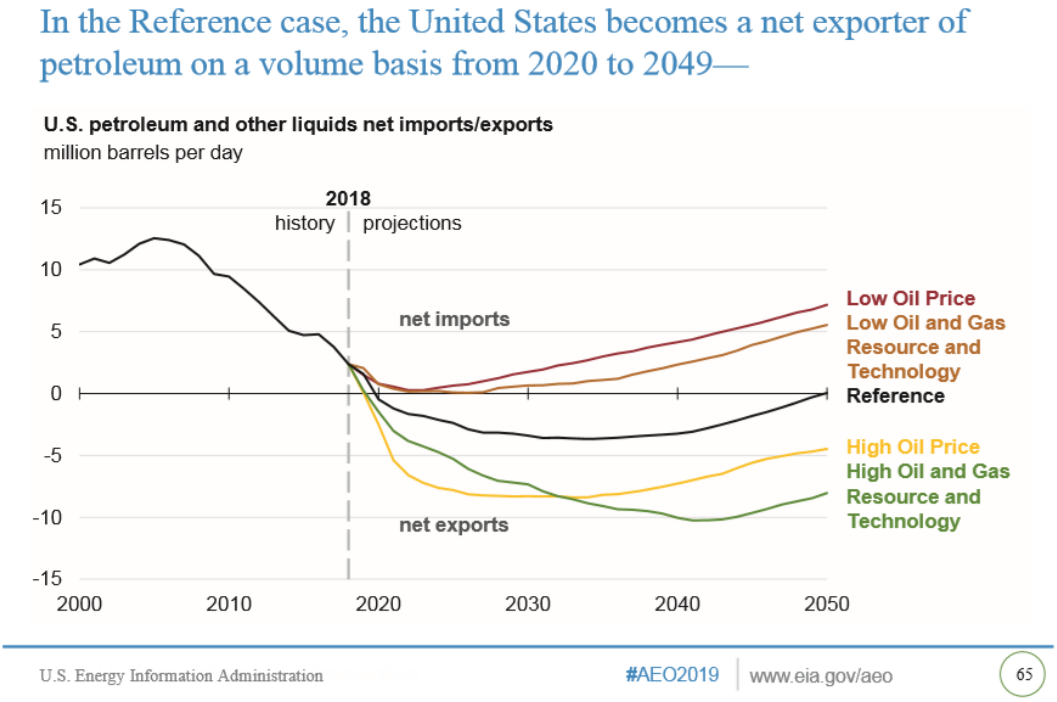
Figure 23: U.S. Oil Exports [99]



Production of unconventional oil in the lower-48 states is projected to continue. As a result, the EIA has estimated that the U.S. will become a net exporter of oil by 2020 under the Reference Case and remain so through 2050 (**Figure 24**). If oil and gas prices increase, U.S. oil production also would increase and the U.S. would export even more oil, resulting in net exports of potentially 10 million barrels per day by 2040. In contrast, under low oil prices (i.e., Brent prices at around $50 per barrel),[100] domestic oil production could decline and demand increase,[101] maintaining the country's current position as a net importer of oil.

[99] U.S. EIA, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MCREXUS2&f=M
[100] U.S. EIA, AEO 2019, p. 34.
[101] U.S. EIA, AEO 2019, p. 16.

Figure 24: U.S. EIA Projection that the U.S. is a Net Exporter of Oil[102]



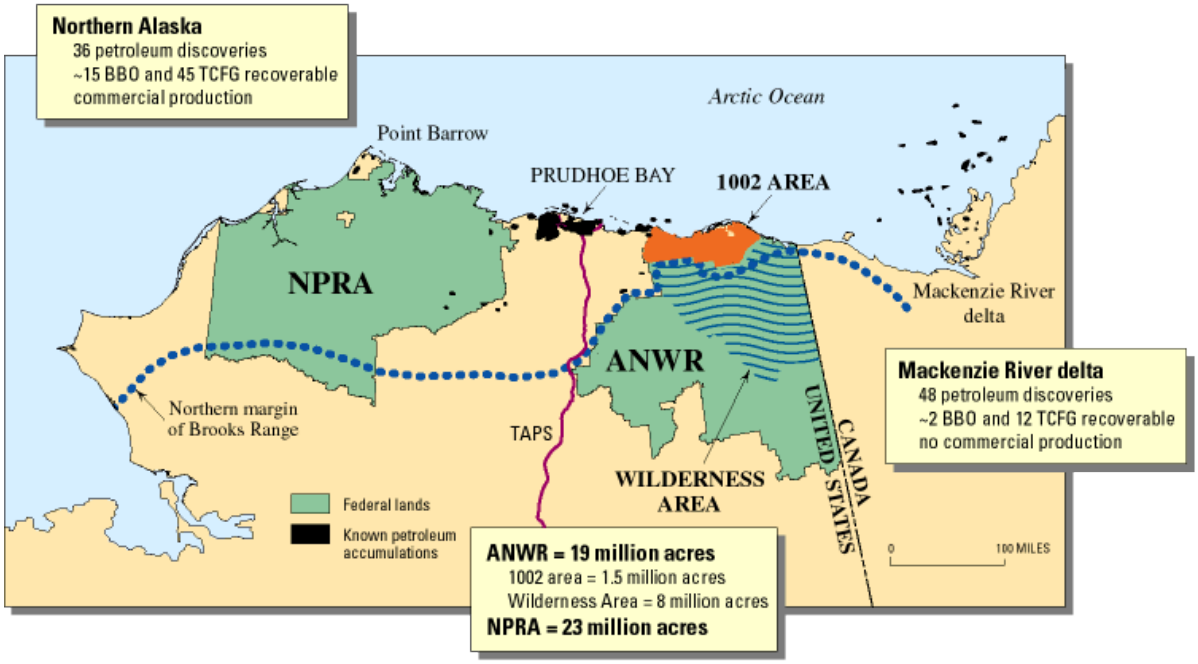
When oil prices are high enough to support development of the 1002 Area, the oil is not needed for domestic use because the U.S. is a net exporter of oil at those prices. When oil prices are low enough that the U.S. is a net importer, oil production from the 1002 Area is more expensive than market prices as well as the less costly shale oil resources in the lower-48 states. Therefore, any oil that could be produced economically from the 1002 Area would be sold into international markets.

- <u>The 1002 Area faces competition from the North Slope</u>

A recent announcement from the Department of Interior ("DOI") indicates that ANWR oil also faces increased competition from other resources on the North Slope of Alaska. Although production from Prudhoe Bay has declined over the years, recent studies have confirmed a significant amount of oil still is available in the National Petroleum Reserves in Alaska ("NPRA"). Located to the west of ANWR on the North Slope, NPRA already has a significant amount of drilling and testing (**Figure 25**). The DOI recently confirmed recoverable oil reserves totaling 8.7 billion barrels onshore in the NPRA compared to previous 2010 estimates of only 1.5 billion barrels.[103]

[102] U.S. EIA, AEO 2019, p. 65.
[103] Department of Interior, "New Interior Department Survey Shows HUGE Increase in Recoverable Energy Resources in Federal, State and Native Lands and Waters in Alaska," December 22, 2017,

Figure 25: Location of National Petroleum Reserve in Alaska versus ANWR[104]



Resources in or near the NPRA could be more competitive than potential production from ANWR for the following reasons:

1) **Proved Reserves:** Reserves already have been tested and proven whereas ANWR does not have any recent data and would require expensive test drilling.

2) **Single Pool versus Multiple Traps:** It appears that the new NPRA reserves may reside in large pools, making it more economic to develop whereas ANWR appears to be located in multiple traps, creating more uncertainty and more expensive extraction.

3) **Operations:** Extraction already has been occurring in the NPRA, creating certainty and potentially existing infrastructure that can be levered.

4) **Timing:** Leases already are being sold, primarily on contiguous parcels to existing production, allowing for faster time to market.

5) **More Certainty:** Given the long history of drilling in the NPRA, there is less uncertainty around key issues that have yet to be surmounted as compared to ANWR.

As a result, NPRA creates potentially formidable competition that could be first to utilize the

https://www.doi.gov/pressreleases/new-interior-department-survey-shows-huge-increase-recoverable-energy-resources

[104] USGS, https://pubs.usgs.gov/fs/fs-0028-01/image1.gif

available TAPS capacity and contract with existing Jones Act vessels, leaving oil from the 1002 Area without access to market and requiring an even larger commitment to procure transportation for uncertain volumes.

- The 1002 Area production is not competitive

Shale technology dramatically impacts the "need" for oil from the 1002 Area. With shale oil production continuing to rise, and the U.S. projected to be a net exporter of oil by 2020, ANWR oil is not needed to meet domestic needs.[105]

A comparison of the marginal cost of supply from ANWR to shale costs of production indicate that oil supply from ANWR would not be able to compete with most other domestic sources. Estimated breakeven costs of production from ANWR currently are expected to be well above those of shale plays in the lower-48 states. Even if ANWR achieves cost reductions over time similar to the downward trajectory of the cost curve realized by shale, the transportation costs from Valdez to the U.S. in addition to new pipeline costs would make ANWR the more expensive option. As a result, ANWR oil is not likely to displace U.S. domestic production of oil.

Instead, if oil prices do rise to high enough levels to support production (an unlikely situation given technological changes on both the supply and demand side), ANWR oil is likely to be sold on the global market. Although international sales would serve to decrease the U.S. trade balance, making the U.S. even more of a net exporter, ANWR oil is not likely to displace existing or anticipated U.S. production. It simply cannot compete.

- Key points about impact of technology on global supply

Conventional oil reserves are heavily concentrated in the Middle East and Russia. Unconventional reserves have added Canada, Venezuela and the United States to the mix. As technology continues to evolve, new sources of supply are found. For example, China recently declared that it had discovered a massive source of shale supply in the north.[106] The discovery of shale fields increases reserves for those countries that have the resource, potentially upending the world order of oil under conventional plays.

The U.S. has confirmed significant volumes of oil in a number of shale plays. These reserves have increased domestic production dramatically, and at lower costs over time as the shale equipment and drilling achieve incremental improvements. As a result, the EIA projects that the U.S. will be a net exporter of oil by 2020. The increase in reserves also puts the U.S. into the position of being the swing producer. As a result, market prices are likely to hover around the marginal cost to produce shale oil as the U.S. responds to upward pressure on prices wrought

[105] This conclusion is supported by the U.S. EIA projections where ANWR crude oil production from 2031 to 2050 is zero in the Low Oil Price case. AEO 2019, p. 46.
[106] Paraskova, Tsvetana, "China says massive shale oil supply found in North," Oilprice.com, March 1, 2019, https://oilprice.com/Energy/Crude-Oil/China-Says-Massive-Shale-Oil-Reserves-Found-In-North.html

by OPEC quotas with increased supply.

The net result is that the 1002 Area leases are likely to remain uncompetitive against other domestic resources and uneconomic globally. More expensive than shale in the lower-48 states, ANWR oil will not be able to compete with domestic alternatives. Limitations tied to Jones Act tankers also may prevent ANWR oil from physically being delivered into the lower-48 states. Instead, any oil from ANWR that possibly could be developed economically, is likely to be sold into international markets. Although these oil exports would offset the U.S. trade balance, they would not be physically delivered to or consumed by domestic end-users.

- IMPACT OF NEW TECHNOLOGIES ON DEMAND FOR OIL

The demand-side also is facing significant changes to technology that can disrupt oil markets. A number of technological innovations are reaching a tipping point and marching towards convergence, promising to reduce demand for oil, potentially resulting in a precipitous decline in oil prices before 2030. As the 2014 oil price crash showed, even a small surplus of 2 million barrels per day can unsettle markets and drop prices by more than 70 percent. Even 1.2 million barrels per day – an amount that OPEC recently announced would be the intended reduction in output – is expected to cause oil prices to rise.[107] In the event technology prompts lower demand of around these same levels, prices are likely to fall causing oil from the 1002 Area to continue to be uneconomic and undeveloped.

- Transportation technologies are converging

As already mentioned, transportation is a key contributor to oil consumption. Worldwide, 40 percent of petroleum products fuel cars and trucks.[108] In the U.S., roughly 47 percent of petroleum products sold in the U.S. went to finished motor gasoline (which is used in personal vehicles); diesel and heating oil composed 20 percent.[109] Of the 14 million barrels per day sold for transportation in the United States, around 9.3 million barrels per day was considered finished motor gasoline. Therefore, less than 25 percent of consumption from the U.S. automobile sector is required to achieve market pressures similar to those experienced during the 2014 crash. A lower level of adoption is required globally – only around 10 percent conversion from gasoline-miles to electric.

Four factors related to the transportation sector are converging that could lead to a dramatic decline in oil prices:

[107] Reid, David, "Saudi Arabia's oil deal with Russia is now 'more fragile than ever,' analyst says," CNBC, February 19, 2019, https://www.cnbc.com/2019/02/19/saudi-arabias-opec-oil-deal-with-russia-could-fail.html
[108] International Energy Agency indicates global oil demand in 2017 was cars (23%) and trucks (17%), p. 140, "World Energy Outlook 2018," IEA Publications, November 13, 2018, https://www.iea.org/weo2018/
[109] U.S. EIA, "In 2017, consumption of finished motor gasoline averaged about 9.33 million b/d (392 million gallons per day), which was equal to about 47% of total U.S. petroleum consumption," Independent Statistics & Analysis, Use of Oil, https://www.eia.gov/energyexplained/index.php?page=oil_use

- **Batteries:** Improvements to lithium ion batteries giving them a faster charge, longer life, longer range, and lower replacement cost;

- **Electric Vehicles:** Cost improvements to electric vehicles, in addition to lower battery costs, are making them more cost effective than the traditional internal combustion engine vehicles;

- **Autonomous Vehicles:** Sensing, data-driven technology as well as a familiarity and consumer comfort with the concept of self-driving autos and optimized operations will reduce average miles per gallon consumed; and

- **Ride sharing:** Growing familiarity with using smart phones and other personal communications devices to hail cars instead of only using a self-provided private vehicle for transportation will make for a smoother transition to more effective transportation options.

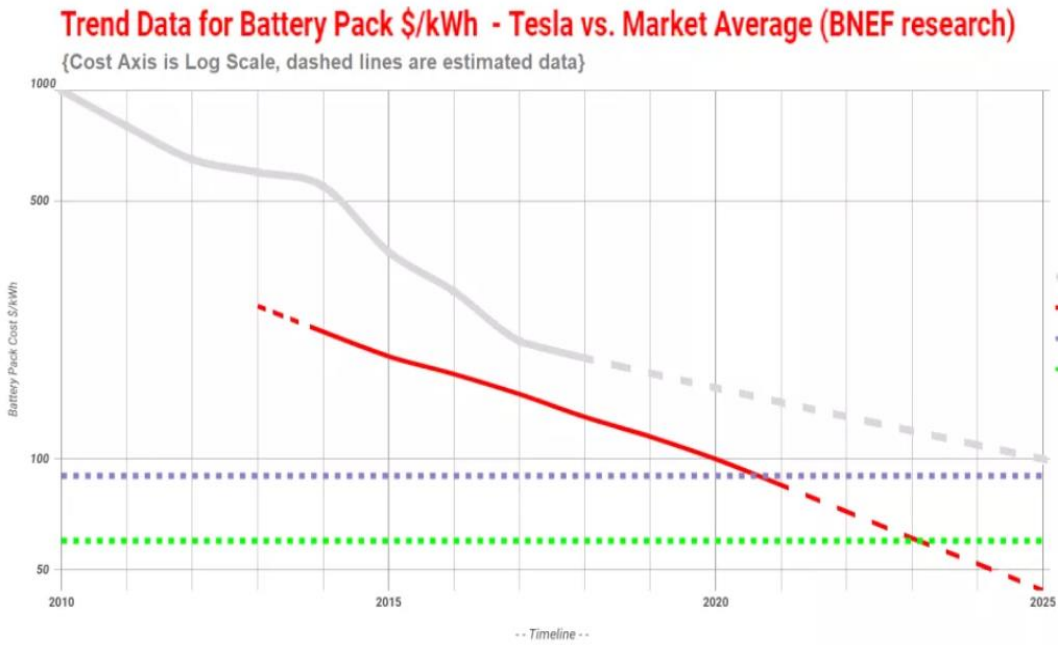
Each of these factors on their own would create a major shift in demand for petroleum-based automobile ownership and miles driven. Together, they converge to create an accelerated adoption of "Transportation as a Service" (TaaS), creating sizable shifts in demand for oil. Additional detail of how these factors promise to decrease demand for oil are described in more detail below.

Batteries

Lithium-ion battery prices are arguably the largest component driving growth in electric vehicles. The lower the cost of the battery and the better batteries perform, the closer electric vehicles come to parity with internal combustion engine vehicles fueled by gasoline. Between 2010 and 2017, battery prices fell by nearly 79 percent from $1,000/ kWh to $209/kWh, rapidly approaching the $100/kWh price point required for electric vehicles to compete directly with traditional vehicles (**Figure 26**).[110]

[110] The measure of the cost of a battery in $/kWh reflects the total cost of the battery divided by the number of kWh it can discharge. The $100/kWh parity with internal combustion engines converts the cost per mile into a cost per kWh with a conversion of miles per kWh. Therefore, the lower the cost of the battery and the more efficient the charge in miles per kWh, the better the battery. Lambert, Fred, "Electric vehicle battery cost dropped 80% in 6 years down to $227/kWh – Tesla claims to be below $190/kWh," *Electrek*, January 30, 2017, https://electrek.co/2017/01/30/electric-vehicle-battery-cost-dropped-80-6-years-227kwh-tesla-190kwh/

Figure 26: Projected Cost of Lithium-ion Batteries[111]



With continued development and improvements, Bloomberg projects that batteries will cost only $70/kWh by 2030.[112] Tesla's more optimistic forecasts support a $90/kWh price point by 2021 and $60/kWh by 2023.[113] By the mid-2020s, if not sooner, electric vehicles are projected to be able to compete with traditional vehicles directly based on capital cost alone.[114]

[111] Holland, M., "$100/kWh Tesla Battery Cells This Year, $100/kWh Tesla Battery Packs in 2020," *Clean Technica*, June 9, 2018, https://frontera.net/news/global-macro/the-5-biggest-electric-vehicle-manufacturers-in-brics-nations/

[112] Morsy, Salim, Bloomberg New Energy Finance Group, *Electric Vehicles*, 2018, https://bnef.turtl.co/story/evo2018?src=TW

[113] Holland, M., (2018).

[114] Electric vehicles already are less costly based on operating costs tied to fewer moving parts and lower fuel costs in the form of electricity versus gasoline.

Electric Vehicles

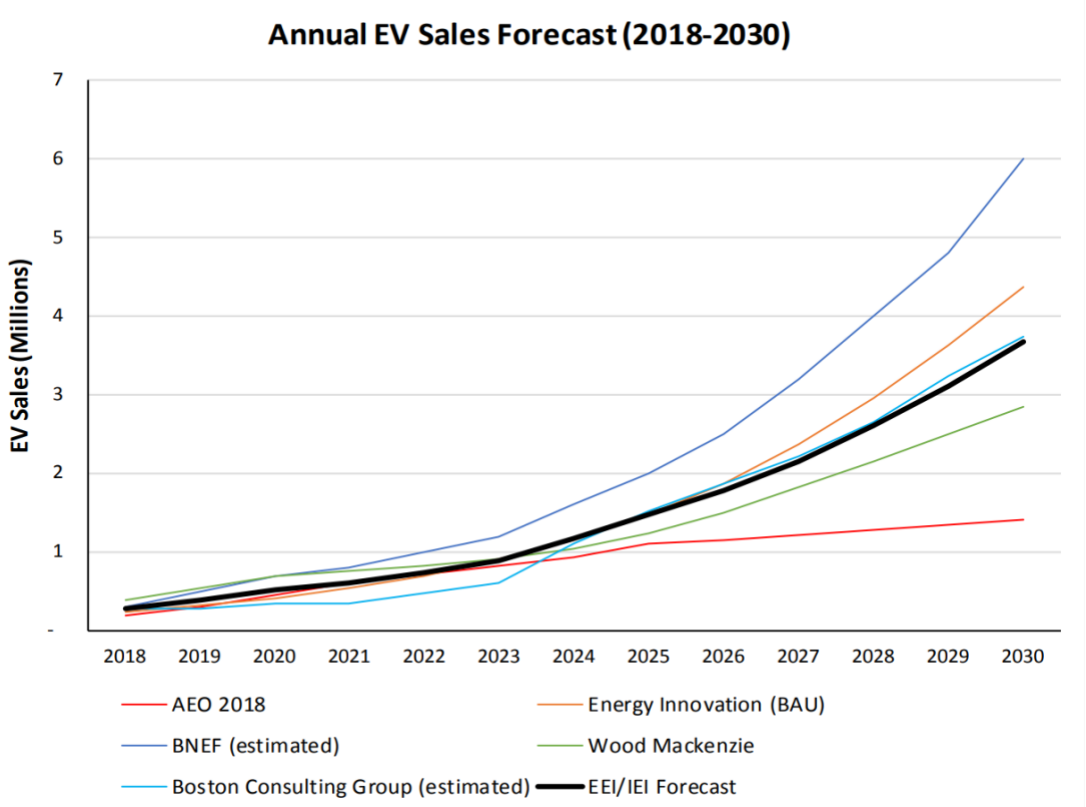
Spurred by better, faster and cheaper batteries, electric vehicle sales (which have been growing by 30 to 60 percent per year) are projected to accelerate during the 2020s. Accelerated sales will be fed by the current decisions already made by a number of mass market automobile companies to focus on production of electric vehicles. For example,

- GM plans on introducing 20 electric vehicle models by 2023.[115]
- BMW plans on selling 25 electric vehicle models by 2025, of which 12 will be pure electric.[116]
- Audi's 2019 Superbowl commercial promises that one-third of its vehicles will be electric by 2025.[117]
- Most other major automobile manufacturers are adding electric vehicles to their passenger car and light duty truck fleets.

Compared to global sales of around 80 million internal combustion engine cars per year, of which almost 20 million are sold in the U.S., electric vehicles promise to become mainstream. Bloomberg projects global sales of 6 million electric vehicles per year by 2030, for a total of nearly 30 million electric vehicles on the road worldwide, lead by China.[118] By 2035, according to McKinsey's 2019 projections, electric vehicle sales to exceed 100 million in the reference case.[119] In contrast, AEO 2018 and 2019 projections assume only 1.5 million electric vehicles are sold per year by 2030.[120] A number of other projections fall in between (**Figure 27**).

[115] Evans, Brian, "GM Could be Shifting Toward Electric Sooner Than Expected," *The Drive*, October 31, 2018, http://www.thedrive.com/tech/24595/gm-could-be-shifting-toward-electric-sooner-than-expected
[116] Brzozowski, Aaron, "BMW Electric Vehicle Plan Looks A Lot Like GM's, Others'," GM Authority, October 1, 2018, http://gmauthority.com/blog/2018/10/bmw-electric-vehicle-plan-looks-a-lot-like-gms-others/
[117] Audi, "'Cashew' - 2019 Super Bowl Commercial," https://www.youtube.com/watch?v=7x58qVzUz0U
[118] Bloomberg NEF, "Electric Vehicle Outlook 2018," https://about.bnef.com/electric-vehicle-outlook/
[119] McKinsey,"Global Energy Perspective 2019: Reference Case," January 2019, p. 24, https://www.mckinsey.com/industries/oil-and-gas/our-insights/global-energy-perspective-2019
[120] U.S. EIA, AEO 2019, p. 128.

Figure 27: EEI Comparison of Projected Sales of Electric Vehicles[121]



Depending on how quickly batteries, electric vehicles and other factors converge, all of these projections could significantly understate conversion to electric vehicles. For example, BP projects that electric vehicles could total 350 million by 2040, of which 300 million would be passenger cars. Although at that level of adoption only 15 percent of cars would be electrified, BP projects that autonomous vehicles and ride sharing could result in electric vehicles providing nearly one-quarter of total passenger vehicle miles.[122]

[121] Edison Electric Institute (EEI). "Electric Vehicle Sales Forecast and the Charging Infrastructure Required Through 2030," November 2018.
Rissman, J., "The Future Of Electric Vehicles In The U.S., Part 1: 65%-75% New Light-Duty Vehicle Sales By 2050," Forbes, September 14, 2017, https://www.forbes.com/sites/energyinnovation/2017/09/14/the-future-of-electric-vehicles-in-the-u-s-part-1-65-75-new-light-duty-vehicle-sales-by-2050/#7f656e08e289

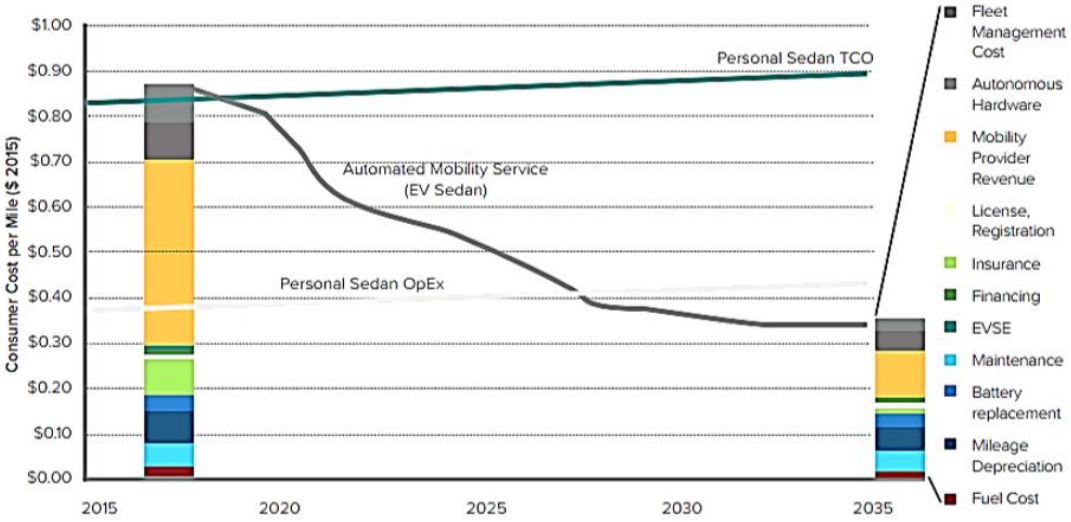
[122] British Petroleum, "BP Energy Outlook: 2019 Edition," February 2019. See also:
Bousso, R., "BP Sees Self-Driving Electric Vehicles Crimping Oil Demand by 2040," Reuters, February 20, 2018, https://www.reuters.com/article/us-oil-bp/bp-sees-self-driving-electric-vehicles-crimping-oil-demand-by-2040-idUSKCN1G41XK

Autonomous Vehicles

Driverless cars already exist and are beta testing the streets of selected cities and towns. In particular, sensors, automated response, and LIDAR (Light Detection and Ranging) have been combined in existing models as well as in the prototypes for autonomous vehicles to mimic what a driver actually does while driving, but with greater accuracy. The cost of these technologies, as well as their application in vehicles, continues to come down the cost curve.

Although autonomous capability will make such vehicles more costly than human-operated vehicles, the combination with shared electric vehicles will be less expensive than owning a personal vehicle or even ride-hailing and human-operated taxi-services. The cost of using an electric sedan could decline from $0.64 per mile in 2018 to about $0.26 by 2035 (U.S. dollars)[123] (**Figure 28**).

Figure 28: Automated versus Personal Car Costs (Canadian Dollars)[124]



Autonomous vehicles are expected to play a significant role in personal transportation. IHS Market recently released its projections for the Autonomous Vehicle Market and concluded that more than 33 million autonomous vehicles will be on the road with 7.4 million sold annually by 2040.[125] The most significant growth is projected to occur in the Asia Pacific region followed by the Americas.[126] Primary purchasers will include ride sharing services and taxi companies

[123] The assumed exchange rate from Canadian dollars to US dollars is CAN$1 to US$0.75.
[124] Litman, T., "Autonomous Vehicle Implementation Predictions: Implications for Transport Planning," Victoria Transport Policy Institute (VTPI), November 26, 2018, p. 8, https://www.vtpi.org/avip.pdf
[125] Culver, Michelle, "Autonomous Vehicle Sales to Surpass 33 Million Annually in 2040, Enabling New Autonomous Mobility in More Than 26 Percent of New Car Sales, HIS Markit Says," IHS Markit, January 2, 2018, https://news.ihsmarkit.com/press-release/automotive/autonomous-vehicle-sales-surpass-33-million-annually-2040-enabling-new-auto
[126] *Ibid.*

where human drivers can be displaced, saving costs and creating fewer opportunities for human error.

Significant volume growth in autonomous vehicles is expected to begin in 2021. Although the U.S. will take the lead in adoption, China will soon take over. Aging societies such as Japan also will adopt autonomous vehicles as a transportation service readily embraced by the technology-oriented culture. Autonomous electric vehicles will go global, displacing demand for gasoline and petroleum-based motor fuels.

Ride Sharing

Ride sharing is the final piece of the puzzle, reducing the cost per mile to well below the price of a human-operated internal combustion engine vehicle that runs on petroleum-based motor fuels. Many people already are becoming acclimated to using smart phones to electronically hail rides, share rides with other people, and make economic decisions based on differential pricing that reflects timing of service and type of vehicle. ZipCar established car sharing without associated ownership. Uber and Lyft services are the precursors to ride-sharing with autonomous electric vehicles; their stated strategies are to develop TaaS.

The transportation market has seen a shift in the growing demand for ride sharing services and a decline in car ownership. Goldman Sachs recently estimated that the ride hailing industry will grow to $285 billion by 2030, displacing the taxi market.[127] Ride hailing is expected to increase from 15 million trips per day to 97 million by 2030.[128] The lower cost of autonomous electric vehicles will drive electric vehicle fleet adoption.

- Oil demand growth is offset by electric vehicles

The combination of technological changes described in the prior section will converge to decrease demand for oil. As already mentioned, dramatic price impacts can occur with changes of 1 to 2 million barrels per day.

A number of industry projections anticipate at least this level of impact.

- **Bloomberg:** Expects electrified buses and cars will displace a combined 7.3 mbpd of fuel by 2040; current growth rates put a projected oil-crash benchmark of 2 million

[127] Huston, C., "Ride-hailing industry expected to grow eightfold to $285 billion by 2030," Market Watch, May 27, 2017, https://www.marketwatch.com/story/ride-hailing-industry-expected-to-grow-eightfold-to-285-billion-by-2030-2017-05-24

[128] Research and Markets, "$218 Billion Ride Sharing Market – Global Forecast to 2025," Globe Newswire, January 17, 2019, https://globenewswire.com/news-release/2019/01/17/1701096/0/en/218-Billion-Ride-Sharing-Market-Global-Forecast-to-2025.html

barrels per day by 2028.[129]

- **Forbes:** Issued a report on a study by Carbon Tracker that shows that electric vehicles will displace 2 million barrels per day in the mid-2020s with an alternative case scenario showing a reduction of 8 million barrels per day by 2030.[130]

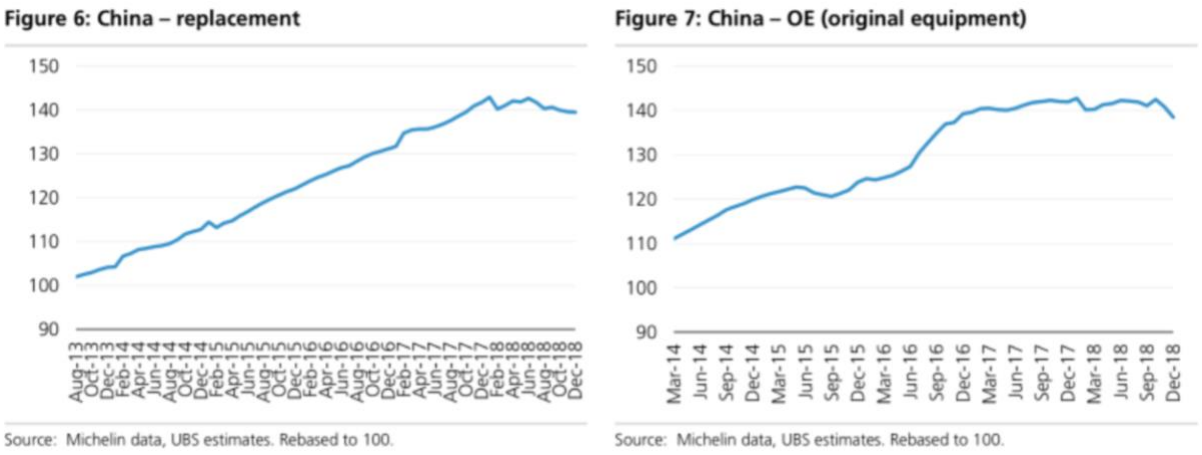
- **International Energy Agency:** The World Energy Outlook projects that oil use in cars will peak in the mid-2020's; improvements in fuel efficiency for conventional cars will displace 3 times more oil demand than electric vehicles (i.e., 3 million barrels per day due to electric vehicles plus another 9 million barrels per day from fuel efficiency improvements in internal combustion engine vehicles by 2040).[131]

These trends, combined with policy efforts to address carbon emissions, are likely to cause declines in demand for oil and oil products by developed countries. These declines could completely offset any potential growth in demand from developing countries.

Indeed, a number of indicators already appear to show softening in automobile ownership and usage. For example, tire sales in China – on original cars and replacement – have both experienced a decline over the past year or two (**Figure 29**). Although the slow down can be blamed on a slower growth, economic contraction is exactly when oil prices tend to fall.

[129] Bullard, N., "Oil Demand for Cars Is Already Falling," Bloomberg, November 16, 2018, https://www.bloomberg.com/opinion/articles/2018-11-16/oil-demand-for-cars-and-transportation-is-already-falling
Randall, T., "Here's How Electric Cars Will Cause The Next Oil Crisis," Bloomberg, February 25, 2016, https://www.bloomberg.com/features/2016-ev-oil-crisis/
[130] Jackson, F., "EVs Alone Could Peak Oil Demand In The Late 2020s, Forbes, July 2, 2018, https://www.forbes.com/sites/feliciajackson/2018/07/02/evs-alone-could-peak-oil-demand-in-the-late-2020s/#569161645ce5
[131] International Energy Agency, "Executive Summary," World Energy Outlook (2018).

Figure 29: Automobile Tire Sales in China[132]



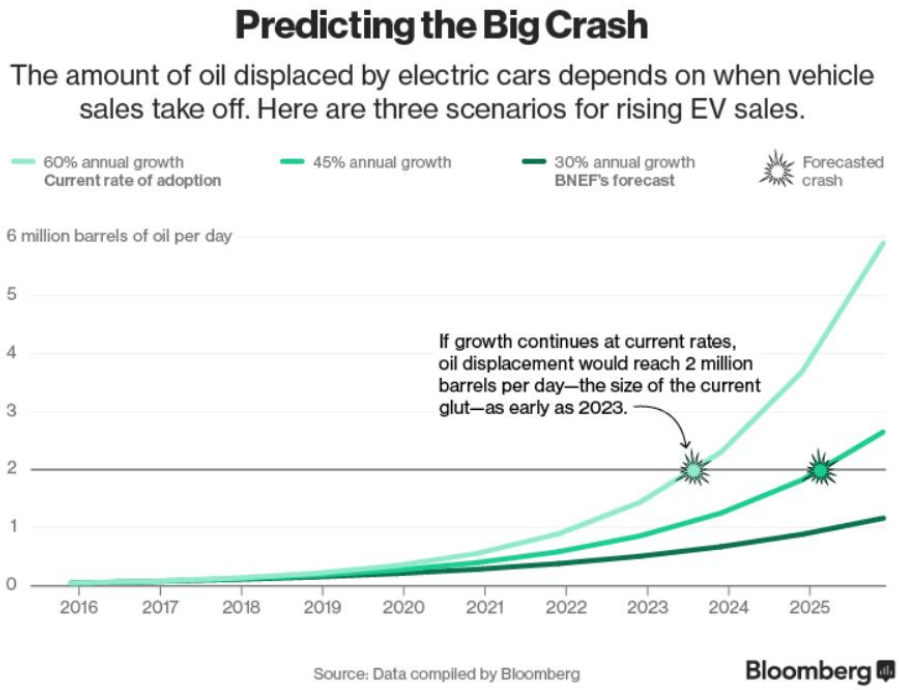
Therefore, even though developing countries may take the lead in shifting towards electric vehicles for purposes of reducing carbon emissions, countries with lower per capita income such as China, India and Brazil may not be far behind due to economics. As a result, potential growth in international demand could be flat or more than offset by reductions in developed countries whose large urban centers and low per capita income makes ride sharing the more economic solution to transportation than car ownership.

- Lower demand should lower oil prices

A number of industry pundits are projecting a crash in oil prices tied to when the amount of oil displaced by electric vehicles reaches a tipping point. Working off the 2014 crash when supply exceeded demand by only 2 million barrels per day, Bloomberg projects the displacement of internal combustion engine vehicles by electric vehicles to reach a tipping point by as early as 2023 under an assumed growth in the rate of adoption of 60 percent per year. A growth rate of 30 percent per year results in a crash in 2028 (**Figure 30**).

[132] Edwards, Jim, "Carpocalypse now: Lyft's founders are right — we're already in the endgame for cars," March 3, 2019, https://www.msn.com/en-us/money/markets/carpocalypse-now-lyfts-founders-are-right-—-were-already-in-the-endgame-for-cars/ar-BBUjimn?ocid=spartanntp

Figure 30: Bloomberg's Predicted Timing of an Oil Price Crash[133]



As already noted, there are a number of projections that show similar reductions in demand occurring during the 2020's (see **Section E**). Stanford's Tony Seba originally equated the anticipated decline in demand for oil to a decrease in oil prices down to $25 per barrel by 2030,[134] but more recently indicated that the crash can occur by the early 2020's.[135] McKinsey projects peak demand for oil by 2035, with most of the growth in demand for oil from industry offset by reductions in demand for oil due to less demand from transportation.[136] McKinsey's accelerated case has peak oil demand occurring before 2025 with total demand for oil in 2050 falling to half of today's levels.[137]

The pace of change is faster than ever, with cost curves steeper and adoption rates quicker. The convergence of vehicle transportation technology could be faster and more disruptive than consensus indicates. If that is the case, oil prices would fall before drilling in the 1002 Area begins, indefinitely postponing development. As one of the most expensive undeveloped resources, the 1002 Area would not be developed given anticipated changes in

[133] Randall, T., "Here's How Electric Cars Will Cause The Next Oil Crisis," (2016).
[134] Arbib, James and Seba, Tony, "Rethinking Transportation 2020 – 2030: The Disruption of Transportation and the Collapse of the Internal-Combustion Vehicle and Oil Industries," May 2017, p. 41, https://static1.squarespace.com/static/585c3439be65942f022bbf9b/t/59f279b3652deaab9520fba6/1509063126843/RethinkX+Report_102517.pdf
[135] Seba, Tony, "Clean Disruption of Energy and Transportation," Presented at the 70th Conference on World Affairs, Boulder, Colorado, April 9, 2018., starting at 56:50, https://www.youtube.com/watch?v=duWFnukFJhQ
[136] McKinsey, "Global Energy Perspective 2019: Reference Case," p. 25.
[137] McKinsey, "Global Energy Perspective 2019: Reference Case," p. 24.

supply and demand for oil.

- Impact of 1002 Area production on oil prices is negligible

As the market evolves, OPEC will attempt to maintain prices and market share. Although OPEC can respond with reduced production to maintain prices, market share will suffer. If higher prices are maintained, U.S. shale will invest and produce even more product at prices ranging from $35 to $65 per barrel or lower. The net result will be an industry operating on the flatter part of the supply curve, where OPEC sets quotas that are quickly countered by shale supply response from the U.S.

Studies performed in 2008 on the impact of production from the 1002 Area concluded that these dynamics would mitigate any potential impact of new supply on global oil prices. For example, a working paper prepared for the Reg-Markets Center in 2008 found that drilling would have only a modest impact on world oil prices—on the order of one percent.[138] Similarly, Kotchen and Burger (2007) concluded, "Domestic oil prices are determined in a world market and would be unaffected by the relatively small annual flows from ANWR."[139] These studies were performed when oil prices were at their highest, and the supply curve was reaching equilibrium at its steepest. Under current conditions, the impact should be even smaller. In the anticipated scenarios where 1002 Area leases are sold, but never developed due to market prices and competition, there would be no impact on global prices for oil.

In contrast, the response of market prices to lower demand could be dramatic. Depending on the volatility around market price adjustments, OPEC members may quickly defect from OPEC quotas, preferring to sell their oil assets at any price but zero or suffer stranded assets that remain in the ground. Should OPEC cooperation fail in those circumstances, oil prices could quickly crash as the effective marginal cost of production approaches an opportunity cost of zero. This death spiral would shut-down the most expensive areas of production and prevent undeveloped areas from receiving investment while the market finds a new equilibrium based on new sources of supply and decreased demand for oil.

Saudi Aramco's CEO has slammed this theory, claiming that projections of peak demand are hype and illogical. Although automobiles compose more than 20 percent of global demand for oil, other transportation options such as shipping, aviation, and trucks do not currently have non-petroleum based fuel alternatives.[140] Over time, however, this could change, especially with respect to trucks, which would benefit most from autonomous electric vehicles that have significantly lower fuel and maintenance costs than current modes of transportation. Greater

[138] Hahn, Robert and Passell, Peter, (2008), p. 18.
[139] Kotchen, Matthew and Burger, Nicholas E., (2007), p. 4723.
[140] Reuters, "Aramco CEO says oil industry facing a crisis of perception," February 26, 2019, https://www.reuters.com/article/us-saudi-aramco-oil/aramco-ceo-says-oil-industry-facing-a-crisis-of-perception-idUSKCN1QF0YN

efficiency in jet engines and shipping also could reduce demand for oil. Economic incentive combined with the convergence of existing technologies will motivate innovation.

Despite Aramco's dismissiveness, almost every major oil company includes a projection of declining demand under increases in sustainability initiatives. For example, BP includes a "Rapid Transition" scenario where demand for oil starts to fall off by mid-2025. BP's four other scenarios generally keep global demand for oil at current levels.[141] Shell's annual outlook also includes a scenario where prices fall and/or stay low due to fundamental changes in market conditions tied to new technologies.[142] Only Exxon seems to ignore a potential scenario in which new technology dramatically disrupts global oil markets.[143]

Even the International Energy Agency includes such a scenario in its World Energy Outlook for 2018.[144] One of the three scenarios reflects a "Sustainable Development" scenario where world oil demand falls to well below current levels by 2030 and even further to around 70 million barrels per day by 2040. Correspondingly, oil prices fall to below the breakeven cost to produce from ANWR,[145] rendering oil from the 1002 Area uneconomic.

A dramatic decline in prices below current levels is not required to make the ANWR leases uneconomic. At current oil prices, including those trading on the futures markets, oil from the 1002 Area already is uneconomic to extract. Therefore, all that is required to preclude economically recoverable oil from the 1002 Area is to maintain the status quo. Given the introduction of U.S. shale as a new source of swing supply that serves as a counter to price impacts on OPEC quotas, it is not difficult to envision the current state of play continuing through the leases, especially if there is an economic slowdown.

Even if global demand for oil from developing countries increases dramatically, there will continue to be incentives for increased production from low-cost shale plays to capture higher margins, bringing prices back down to the flat part of the supply curve following short-term responses to temporary shocks.

- Key points on impact of technology on global demand

Demand for oil is facing a number of disruptive technologies that, when combined, could crash oil prices as early as the mid-2020s, and keep them low enough through the 2030s to preclude economic development of 1002 Area oil reserves. Such an event would generate a "peak demand" scenario where demand for oil in developed countries declines faster than growth in developing countries, eventually leading to global adoption of cleaner, more cost-effective

[141] British Petroleum (BP). "BP Energy Outlook: 2019 Edition," February 2019, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2019.pdf
[142] Shell, "Energy Transition Report," 2018, https://www.shell.com/energy-and-innovation/the-energy-future/shell-energy-transition-report.html
[143] Exxon, "2018 Outlook for Energy: A View to 2040," February 2, 2018.
[144] International Energy Agency, "World Energy Outlook 2018," (2018).
[145] *Ibid.*

substitutes for oil.

The risk of such an event is not theoretical. Large industry players such as BP and Shell, as well as government agencies such as the International Energy Agency and others, have modeled this scenario and identified conditions where oil prices stay in the $50 to $75 per barrel range indefinitely. In such scenarios, ANWR reserves would never become economically viable and oil production from the 1002 Area is zero. In such a scenario, there would be no rent or royalty payments. At most, lease payments might reflect a minimal amount of option value tied to the extrinsic value of an asset that is "out-of-the-money" facing a high probability of becoming stranded.

- ANWR LEASE PAYMENTS AND INCOME

This section provides an independent assessment of total revenues that would be generated by the proposed ANWR lease under alternative scenarios.

- Alternative estimates

The CBO estimates that the sale of ANWR leases would generate $2.2 billion; this claim is unrealistic and has been challenged on a number of fronts.

- **Backward-looking Estimates are Inappropriate:** The CBO has made a number of assumptions based on historical information on oil/gas leasing in the US and information from DOI, EIA, and individuals in the oil/gas industry about the factors that affect company willingness to pay to acquire oil and gas leases. This backward-looking approach is not appropriate for today's oil industry that faces fundamental changes to both supply and demand. As the CBO states in its estimate:

> Estimates of bonus bids for leases in ANWR are uncertain. Potential bidders might make assumptions that are different from CBO's, including assumptions about long-term oil prices, production costs, the amount of oil and gas resources in ANWR, and alternative investment opportunities. In particular, oil companies have other domestic and overseas investment options that they would evaluate and compare with potential investments in ANWR.

- **Opposition Estimates:** Opposing the bill, Democrat Maria Cantwell has claimed recent lease sales in Alaska's North Slope suggest ANWR would bring in $76 million at most.[146]

- **Center for American Progress:** An analysis by the Center for American Progress

[146] Harsch, J., "GOP Dems Battle Over Drilling In Alaska Refuge," *Agri Pulse*, November 22, 2017, https://www.agri-pulse.com/articles/10261-gop-dems-battle-over-drilling-in-alaskan-refuge

found that based on recent oil and gas lease sales in the Alaska North Slope, ANWR would only generate $37.5 million over the next 10 years.[147]

An independent analysis of the potential value of leases using recent lease sales supports the lower end of these estimates.

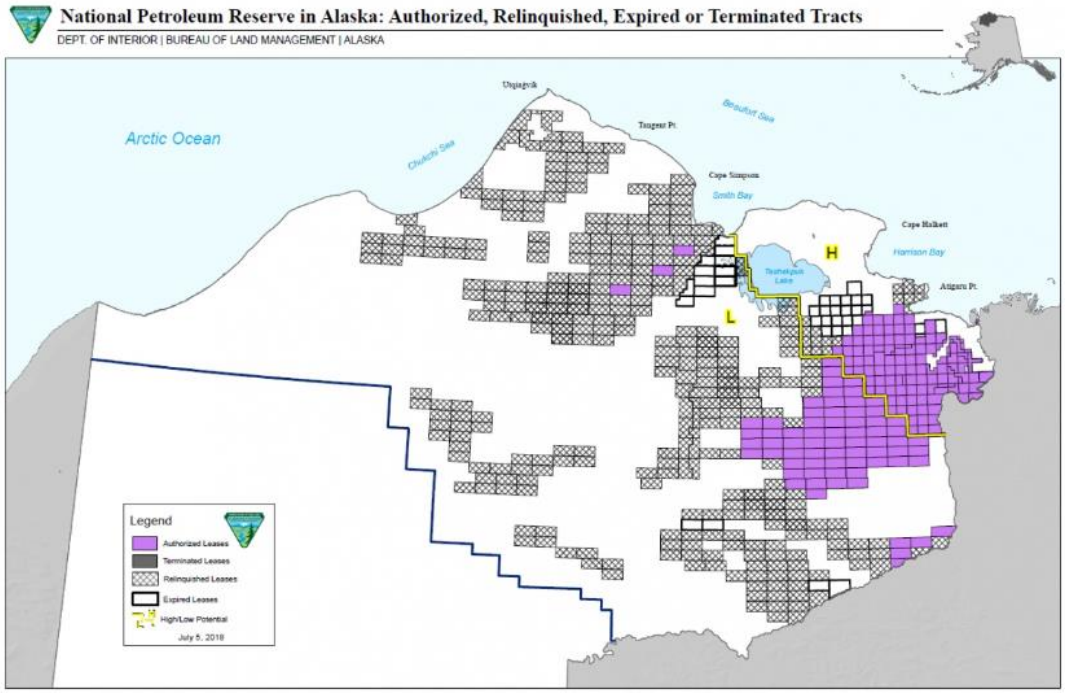
- Lease payments

As already mentioned, the 1002 Area leases are out-of-the-money, with all measures of breakeven prices above current market prices. The value of these leases in terms of volumes of oil and breakeven costs of producing that oil and transporting it to market also are very uncertain. Therefore, the only value that would be paid for the leases on top of the land value, if anything, would be an extrinsic value associated with the opportunity, but not the obligation, to drill.

Lease auctions recently held for the NPRA provides a set of comparable prices for what 1002 Area leases might command. **Figure 31** shows where NPRA leases have been authorized (purple), expired (white), or were relinquished (hatch mark).

[147] Ashley, M., "The Energy Case Against Drilling in the Arctic National Wildlife Refuge," Center for American Progress, November 13, 2017, https://www.americanprogress.org/issues/green/news/2017/11/13/442603/energy-case-drilling-arctic-national-wildlife-refuge/

Figure 31: Leases in the National Petroleum Reserve in Alaska[148]



As illustrated by the number of leases relinquished, a successful lease sale does not guarantee production. The location of authorized leases also is telling; it is important to be closer to transportation (i.e., the TAPS pipeline to the east). The new findings in the Colville River Delta to the east of the NPRA are likely to be very competitive to ANWR.

The value of land leases auctioned by BLM in the nearby NPRA likely provide a maximum price that lease sales from the 1002 Area might be able to generate.[149] Auction results indicate two insights:

1) **Limited Demand:** Although 2.8 million acres were put up to bid in 2018, only 174,044 acres were sold; none of the 22,412 acres considered "high potential" were purchased. In 2017, only around 80,000 acres of the approximately 10 million acres put to auction were sold. The lack of uptake could be indicative of the response that the market would have to ANWR leases which have even more uncertainty with respect to reserves and breakeven costs.

2) **Low Price per Acre:** Leases sold in 2018 ranged from $5.05 per acre to $19.01 per

[148] BLM, Oil & Gas Leases updated 11/2018, https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/about/alaska/NPR-A

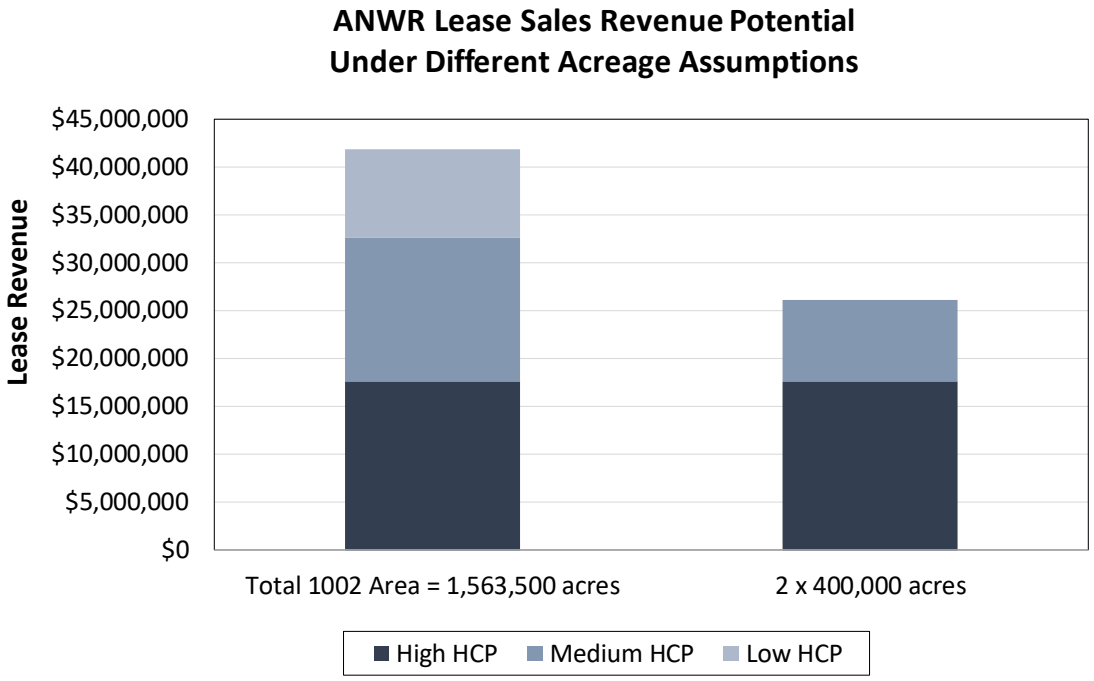
[149] Acreage also is leased directly by the state of Alaska, but provides much fewer data points and was not included in the analysis. State lease data is provided by the State of Alaska, Department of Natural Resources, Division of Oil & Gas, http://dog.dnr.alaska.gov/Information/Data

acre, with a weighted average of $8.81 per acre. In 2017, the weighted average price was slightly lower at around $14.49 per acre. Granted, these lease sales were for low potential acreage. However, even the high potential parcels sold in 2016 were priced at around $40 per acre on average versus the low potential lease prices of $27 per acre (all dollars in nominal terms). The clear implication is that raising $2.2 billion for 800,000 acres is an unrealistic expectation.

Using lease sales prior to the 2014 oil price crash does not provide a much better prognostication. **Figure 32** provides an estimate of the total revenues that could be expected under average conditions from 2013 through 2018 under both a minimum and maximum lease auction acreage of two 400,000 acre parcels versus the entire area. In this analysis, average prices per acre were allocated based on low, medium and high potential according to the prices that cleared in prior auctions for each of these categories to provide an upper bound of what the 1002 Area parcels might command. Assuming the lots in the 1002 Area would be sold, they are likely to go for less than the price paid in the more certain, high volume area of the NPRA.

Even with a higher price expectation, total revenues from the lease sales would not be expected to exceed $40 million. At most, one could expect to see an average price of $25 to $30 per acre, implying total revenues of less than $25 million for the minimum auction acreage to be sold. Half of these potential revenues would be shared with Alaska, leaving less than $13 million in federal revenues generated by the two 400,000 acre parcels.

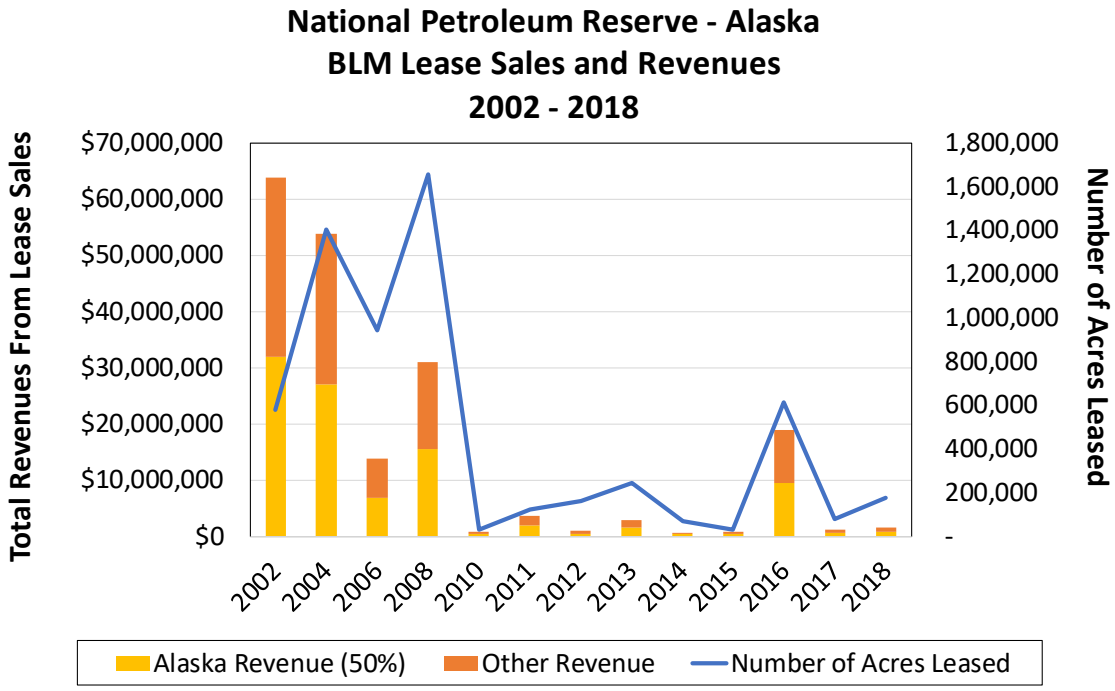
Figure 32: Potential Revenues from Lease Sales of 1002 Area Acreage[150]



An analysis of the total revenues generated by historical NPRA lease sale revenues supports this conclusion. For example, the sale of 615,000 acres in 2016 generated only $19 million in total revenues for a combination of low and high value parcels; in 2008, the sale of leases for 1.6 million acres generated only $30 million (**Figure 33**).

[150] Energyzt analysis of the BLM, Oil & Gas Leases (2018).

Figure 33: Historical NPRA Lease Sale Revenues[151]



○ Rental payments

If the leases are sold, rental payments would occur between acquisition of the lease and production. If market prices do not recover during that time or are anticipated to collapse, lessees could choose to relinquish the lease. Whether or not a buyer continues paying the rental payment will depend on the potential prospects of developing the 1002 Area, which will be highly dependent on market prices for oil.

The CBO estimated that rental payments would total $2 million over the period from 2022 to 2027. This is less than the estimated cost over the 2018 to 2022 period for environmental reviews and administrative costs of around $10 million. Combined revenues from bonus payments and rents to the federal government would barely cover (and could even be less) than the administrative costs.

Even if rental payments extended to 2031, the receipts would make a negligible contribution to the target of $1.1 billion. More likely, however, the lessee would be prepared to

[151] Energyzt analysis based on Alaska Oil and Gas Lease Sales in the National Petroleum Reserve - Reported by the BLM, "Annual NPR-A Lease Sale Bid Recap (2002-2018)," https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/leasing/regional-lease-sales/alaska

abandon the leases in the event that oil prices remained low or crashed before 2030, in which case rental income would be even lower.

- Royalties

If ANWR production is zero, as projected by the EIA in the "Low Oil" scenario where prices remain below $50 per barrel, oil production and royalties would be zero.

Assuming a technological convergence in which supply and demand for oil maintains at current levels, ANWR would remain uneconomic and royalties would be zero.

Under the scenarios where demand and prices crash during the 2020s, as projected by Bloomberg, there would be no royalties.

Only in the case where one projects prices rising above the breakeven price for the 1002 Area production, plus a premium for uncertainty, would royalties be generated. This scenario is not likely to occur before 2031, creating significant uncertainty around any potential for royalties, especially under current conditions.

The risk of a price collapse in the 2020s or even the 2030s, as posited by Bloomberg, McKinsey and the International Energy Agency, would prevent development of the 1002 Area from ever occurring. If the leases are sold, however, and investment is made to identify potential resources in the 1002 Area, an actual or anticipated price crash in the 2030s could lead to cessation of any further investment and preclude production and associated revenues.

- Key points about potential ANWR revenues

The value of the ANWR leases are subject to a significant amount of uncertainty:

- There is no existing infrastructure in place.
- The volume of technically recoverable reserves is not confirmed.
- Breakeven costs are uncertain.
- Market prices for oil currently are below the estimated breakeven costs.
- Transportation costs to ship product to market are expensive, including both pipeline costs and shipping fees.
- Competition from both the nearby NPRA and shale production in the lower 48 states make ANWR production more expensive than domestic production alternatives.
- Additional costs to develop the project, including collection pipeline system and

investment in new Jones Act tankers, create a potential for even higher costs.

- Production from ANWR requires an expensive, long-term commitment of more than 10 years versus more flexible investment options in the U.S. and other parts of the world.

Although, estimated lease payments using historical prices can provide a range of anticipated value under current conditions, a potential bidder may choose not to bid at all or apply a significant discount to the valuation in light of the myriad uncertainties facing the project.

Instead of offering the leases to bid while oil prices are below the anticipated breakeven price, it may be prudent to wait to put the leases out to bid. Adopting this strategy will ensure that national assets are not given away during a low-priced period, especially since the objective of the leases is to raise money and create jobs, neither of which would occur at any significant level under current conditions.

- CONCLUSION

The oil industry is undergoing a fundamental transformation as a result of technological changes on both the supply and demand side. As a result, oil from the 1002 Area currently is not economic to produce and is unlikely to be economic to produce over the longer term. Under current conditions, federal revenues generated by the 1002 Area through 2027 are likely to be much lower than the $1.1 billion target and may not even cover the administrative costs.

ANWR is not economic under current market conditions. Futures markets and near-term projections by oil companies and governmental agencies are in consensus that projected oil prices are expected to continue at around current levels – that is between $55 to $75 per barrel for Brent Crude. This price reflects the marginal cost of production of shale oil, which currently is the marginal resource and is expected to be swing supply for the near future. In contrast, ANWR's breakeven price of around $78 to $90 per barrel make oil from the 1002 Area uneconomic to produce.

Supply-side technology improvements have converted the U.S. from a net importer of oil to a net exporter by 2020 and for the foreseeable future. As a result, ANWR is not needed for domestic demand. Under conditions where the U.S. could be a net importer, the breakeven cost of ANWR would make it even more uncompetitive than market prices. Therefore, the 1002 Area is unlikely to displace any domestic production of oil. To the extent it does produce under conditions of high prices, it would be more expensive than shale plays, and therefore more likely to be sold into international markets.

Technological changes on the demand-side also work against the potential for 1002 Area to become economic. A convergence of existing technologies is projected to reach a tipping point in the early 2020s which would decrease demand for oil. In addition to policy efforts by developing countries to reduce their carbon footprint and demand for oil, market-based economics could have the same impact on international demand. In particular, those very markets that oil companies project as driving increased demand for oil are ideal candidates for

ride sharing through autonomous electric vehicles instead of private ownership of cars internal combustion engine vehicles.

A softening in car ownership already is taking place, which could be a harbinger of the technological convergence that would offset global growth in demand for oil. The net result could be a dramatic decrease in global oil prices, followed by a death spiral tied to uncooperative behavior by OPEC nations desperate to realize value from their otherwise stranded assets of oil reserves. In this environment, the reserves from the 1002 Area would be even more uneconomic and among the first to be stranded.

Given the relative cost of ANWR compared to market price, any revenues generated by sale of 1002 Area leases are likely to reflect nothing more than land value and perhaps a small extrinsic value. The asset itself is "out-of-the-money" – more expensive than domestic and international alternatives. Therefore, any revenues generated in early 2020, under current market price projections, would generate significantly less than the projected $1.1 billion. Furthermore, uncertainty surrounding these costs and the potential magnitude of reserves is likely to create an even bigger discount on potential bid prices. As technology progresses, and ANWR oil becomes even more expensive compared to alternatives, potential rental payments and royalties would be zero. Oil reserves from the 1002 Area are among the most expensive of the undeveloped reserves, making them the first to be stranded in the face of technological changes.

As a result of market conditions and the economics of the oil industry, ANWR is not likely to be economic in the near-term and is unlikely to produce oil in the long-term except under the unlikely condition of sustained long-term growth in demand without a price-responsive change in supply.

ENERGYZT

APPENDIX A
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