



July 31, 2014

Bureau of Ocean Energy Management

Subject: Comments on the Preparation of the 2017-2022 Outer Continental Shelf (OCS) Oil and Gas Leasing Program, BOEM-2014-0059

The Institute for Policy Integrity at New York University School of Law¹ respectfully submits these comments to the Bureau of Ocean Energy Management (BOEM) on its next five-year offshore leasing program. Policy Integrity is a non-partisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy.

BOEM is charged with stewarding vital and valuable resources for the benefit of the American people. On the one hand, the agency must direct the orderly development of offshore oil and gas deposits; at the same time, the agency must safeguard the ecosystems, cultural assets, and human lives affected by resource extraction decisions, and must preserve competing uses of offshore areas.² BOEM thus has a responsibility to ensure the reasonable development of offshore resources so that costs to society are appropriately balanced against the benefits generated. Moreover, BOEM must collect a fair return on any of the American people's oil and gas reserves that are leased for private development. Finally, the agency must attend to the different effects of offshore development on different regions, ecosystems, and communities.

To prepare a five-year program that responsibly leases offshore deposits and collects fair returns; that realistically estimates the regional distribution of costs (and transparently reports the assumptions relied upon in making those estimates); and that follows best practices for policy analysis as well as legal requirements, BOEM should:

- **Quantify the options value of delaying leasing until more information is available on key environmental, social, and technological uncertainties.** Well-established methodologies exist to quantify options value in the context of natural resources. Just as with price uncertainty, the options value generated by environmental and social uncertainty is too significant to ignore. Failing to fully value the American people's offshore resources—including the value attached to the option to delay extraction of those resources—would break with best analytical practices and legal obligations.
- **Weigh options value in decisions on timing and location.** Framing leasing decisions as now-or-never choices made within a single five-year period will systematically lead to inefficient over-exploitation of natural resources. BOEM holds—on behalf of the American public—perpetual options to develop or lease offshore tracts, and the agency must decide

¹ No part of this document purports to present New York University School of Law's views, if any.

² 43 U.S.C. § 1332(3) ("the outer Continental Shelf is a vital national resource reserve held by the Federal Government for the public, which should be made available for expeditious and orderly development, subject to environmental safeguards, in a manner which is consistent with the maintenance of competition and other national needs"); U.S. DEP'T OF THE INTERIOR, STRATEGIC PLAN FOR FISCAL YEARS 2014-2018, at 12 ("The DOI is committed to being an outstanding steward of . . . magnificent vistas, unique ecosystems, and treasured national, cultural, and heritage assets.").

when and where exercising those options will be most opportune. Different regions face different uncertainties and so have different options value. Postponing leasing decisions in any region is legally permissible and may be economically prescribed.

- **Adjust rents and royalties to reflect options value and the environmental and social externalities of resource development.** In bidding on leases, private companies do not fully internalize the costs that offshore exploration and drilling impose on coastal and marine biota and habitats, air quality and the climate, property values, recreation, subsistence harvests, and commercial fishing. BOEM is required, at minimum, to recover the fair market value not just of the energy deposits being leased but of the broader rights to explore and develop offshore resources. Yet the agency currently gives away for free the right for private companies, as part of their exploration and development operations, to inflict many significant social and environmental damages. Similarly, current rents and royalties do not adequately incentivize companies to wait to drill until information on environmentally safer drilling techniques may emerge. BOEM has discretion to adjust rents and royalties to restore the proper balance between efficient levels of offshore development and safeguarding environmental and social values.
- **Make realistic assumptions about the consequences of delaying leases in particular regions.** Not all offshore leases will result in energy production; some leases are stockpiled by companies, and so postponing those leases would not immediately decrease production. Not all energy production will result in domestic consumption; the United States is increasingly a net exporter of oil and gas. Not all energy potentially generated from offshore leases in this five-year program would have to be replaced by domestic energy substitutes (like imports and onshore production) if leases were postponed; in addition to the potential to decrease energy demand and exports, future drilling in the same offshore areas with safer, more efficient technologies could compensate over the long term for any production foregone by temporary postponement. Not all regions of the country experience the same costs and benefits from drilling versus postponement; BOEM should transparently disclose regional differences in costs—including environmental and social costs—and should give special consideration to the uncertain environmental sensitivities and uncertain drilling and remediation technologies facing Arctic regions.

(1) BOEM must quantify the options value of delaying leasing until more information is available on key environmental, social, and technological uncertainties.³

Well-established methodologies exist to quantify options value in the natural resources context. Options value derives from the ability to delay decisions until later when more information is available. The concept's most familiar application is in the financial markets, where investors calculate the value of options to wait for more information on stock prices before deciding whether to buy or sell shares. A conceptually identical and well-established methodology exists to quantify the value of waiting to gain greater information about environmental costs.⁴ The options

³ This section draws from Michael A. Livermore, *Patience Is an Economic Virtue: Real Options, Natural Resources, and Offshore Oil*, 84 U. COLO. L. REV. 581, 591 (2013), and from the Opening and Reply Briefs for Petitioner in U.S. Court of Appeals for the D.C. Circuit Case No. 12-1431, *Center for Sustainable Economy v. Jewell*.

⁴ See Anthony C. Fisher, *Investment under Uncertainty and Option Value in Environmental Economics*, 22 RES. & ENERGY ECON. 197 (2000); W. Michael Hanemann, *Information and the Concept of Option Value*, 16 J. ENVTL. ECON. & MGMT. 23 (1989); Iulie Aslaksen & Terje Synnestvedt, *Are the Dixit-Pindyck and the Arrow-Fisher-Henry-Hanemann Option Values Equivalent?* (Statistics Norway, Discussion Paper No. 390, 2004). For practical guides to calculating options value, see, for example, PRASAD KODUKULA & CHANDRA PAPUDESU, PROJECT

framework has long been applied to natural resource extraction decisions, including offshore oil drilling.⁵ In fact, the petroleum industry routinely accounts for the value of waiting for more information on uncertain future oil prices and production costs, which explains the frequent practice of companies purchasing offshore leases but waiting long periods of time to begin drilling.⁶ Any company that failed to account for options value would risk suboptimal returns on its leases compared to more sophisticated competitors, because failing to account for options value “is not just wrong; it is often very wrong.”⁷ For this reason (and partially in response to previous comments from Policy Integrity on this point), in its most recent five-year program, BOEM did attempt to consider the informational value of delay with respect to price uncertainty, thereby acknowledging the significance of the concept to its lease timing and rental rate decisions.⁸

Just as with price uncertainty, the options value generated by environmental, social, and technological uncertainties is too significant for BOEM to ignore. Relevant uncertainties that generate the value of waiting for more information include:

- Uncertainty about environmental, economic, and social sensitivities to threats associated with drilling, such as the toxicity of spills, the interconnectedness of affected ecosystems, marine and climate conditions that may spread damaging effects from spills, and consequences for coastal land values;
- Uncertainty about the magnitude of risk of catastrophic spills, especially in relatively dangerous or unfamiliar areas like deep-water zones and the Arctic;
- Uncertainty about the development rate of spill-prevention and spill-remediation technologies, as well as technologies that may better protect worker safety;
- Uncertainty about competing uses of offshore areas, such as the potential for renewable energy projects.⁹

Because such uncertainties will vary greatly among offshore regions, options value will be different in different regions. For example, current spill control and remediation technologies are ill-adapted for the challenging winter and ice conditions presented by Arctic regions, meaning the Arctic faces a particularly high level of exposure to technological uncertainty.¹⁰

VALUATION USING REAL OPTIONS: A PRACTITIONER’S GUIDE (2006) and JOHNATHAN MUN, REAL OPTIONS ANALYSIS: TOOLS AND TECHNIQUES FOR VALUING STRATEGIC INVESTMENT AND DECISIONS (2d ed. 2005).

⁵ James L. Paddock et al., *Option Valuation of Claims on Real Assets: The Case of Offshore Petroleum Leases*, 103 Q. J. ECON. 479 (1988); Anthony C. Fisher, *supra* note 4; Jon M. Conrad & Koji Kotani, *When to Drill? Trigger Prices for the Arctic National Wildlife Refuge*, 27 RES. & ENERGY ECON. 273 (2005).

⁶ See Michael Rothkopf et al., *Optimal Management of Oil Lease Inventory: Option Value and New Information* (Rutgers Center for Operations Research, Research Report 22-2006, 2006); Ryan Kellog, *The Effect of Uncertainty on Investment: Evidence from Texas Oil Drilling* (Nat’l Bureau of Econ. Res., Working Paper No. 16,541, 2010); Timothy Dunne and Xiaoyi Mu, *Investment Spikes and Uncertainty in the Petroleum Refining Industry* (Fed. Reserve Bank of Cleveland, Working Paper No. 08-05, 2008); see also William Bailey et al., *Unlocking the Value of Real Options*, OILFIELD REVIEW, Winter 2003, at 4 (describing how companies including ChevronTexaco, Anadarko, and El Paso Corporation incorporate real options into their decision-making processes); Soussan Faiz, *Real-Options Application: From Successes in Asset Valuation to Challenges for an Enterprisewide Approach*, J. OF PETROLEUM TECH., Jan 2001, at 42-47, 74 (analyzing ChevronTexaco’s decision not to sell a marginally-performing lease because of its real options value).

⁷ AVINASH K. DIXIT & ROBERT S. PINDYCK, *INVESTMENT UNDER UNCERTAINTY* (1994).

⁸ See Opening Brief, *supra* note 3, at 51-52.

⁹ See *id.* at 44-46.

¹⁰ See BOEM, OUTER CONTINENTAL SHELF OIL AND GAS LEASING PROGRAM: 2012-2017: FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT, at xlviii.

Failing to fully value the American people’s offshore resources would break with best analytical practices and legal obligations. Over a decade ago, in 2003, the Office of Information and Regulatory Affairs published the *Circular A-4* to distill the best practices for federal agencies’ policy analyses. The *Circular* contains a detailed section on the proper treatment of uncertainty, including uncertainty about environmental and social costs like loss of habitat, risks to endangered species, harms to human health and safety, and climate change. The section explains that:

“Real options” methods have . . . formalized the valuation of the added flexibility inherent in delaying a decision. As long as taking time will lower uncertainty, either passively or actively through an investment in information gathering, and some costs are irreversible, such as the potential costs of a sunk investment, a benefit can be assigned to the option to delay a decision. That benefit should be considered a cost of taking immediate action versus the alternative of delaying that action pending more information.¹¹

The section further specifies that uncertainty should be quantified whenever possible, and that postponing a regulatory decision is always an alternative, especially for irreversible decisions, since “the costs of being wrong may outweigh the benefits of a faster decision.”¹² Leasing and extracting natural resources are essentially irreversible decisions, and many of the potential environmental and social damages from drilling are irreversible as well. In contrast, the decision not to drill can be undone very easily and at any point in the future if the calculation changes as new information on costs and benefits comes to light.

Quantifiable uncertainties about economic, social, and environmental values, as well as the benefits of delaying the timing of leasing to wait for more information, are exactly the kinds of factors Congress intended BOEM to consider in developing its five-year programs. The Outer Continental Shelf Lands Act (OCSLA) repeatedly emphasizes the need for the agency to weigh the environmental risks and sensitivities of various offshore regions in deciding the “timing” of leases. Timing decisions logically must evaluate the advantages and disadvantages of delay. The agency is further instructed to consider “predictive information,” to “anticipate” competing uses, and to “balance between the *potential* for environmental damage, the *potential* for the discovery of oil and gas, and the *potential* for adverse impact on the coastal zone.”¹³ Congress clearly intended for the agency to consider uncertainties and predictions with respect to environmental and social costs and benefits in making its decisions on the timing and location of leases.

BOEM must weigh options value in decisions on timing and location. By framing its leasing decisions as now-or-never choices made within a single five-year period, BOEM risks systematically and inefficiently over-exploiting the country’s natural resources. BOEM holds—on behalf of the American public—perpetual options to develop or lease offshore tracts, and the agency must decide when and where exercising those options will be most opportune. In its previous five-year leasing program, BOEM qualitatively treated some of the environmental cost uncertainty surrounding Arctic leases by slightly delaying those leases to the end of that particular five-year period, and by deferring further consideration until the lease sale stage. Yet, the agency never considered delaying leasing in those or other offshore regions beyond the program’s five-year period, when new information and technology may reveal more favorable cost-benefit calculations.¹⁴ Given that different regions face different uncertainties and so have different options value, BOEM must compare during program development the relative costs and benefits of leasing now or postponing leases; this assessment cannot be conducted later during individual lease sales.

¹¹ U.S. OFFICE OF MANAGEMENT & BUDGET, CIRCULAR A-4, at 39 (2003).

¹² *Id.*

¹³ 43 U.S.C. § 1344(a) (emphasis added).

¹⁴ This section draws from Reply Brief, *supra* note 3, at 24-26.

(2) BOEM should adjust rents and royalties to reflect options value and the environmental and social externalities of resource development.

BOEM has discretion to adjust rents and royalties to restore the proper balance between efficient levels of offshore development and safeguarding environmental and social values. The agency must collect a return of “fair market value for the lands leased and the rights conveyed,” and does so through minimum bids, rents, and royalties.¹⁵ “Fair market value” is not defined in the statute, but the agency has interpreted the phrase to be based on the “value of the right to explore for and . . . develop” offshore resources, and not simply on the value of oil and gas actually produced.¹⁶ More generally, the agency has discretion to prescribe “rental and other provisions” as conditions of leases,¹⁷ and OCSLA mandates that the agency balance environmental and social effects with the potential recovery of oil and gas resources.¹⁸ Because the statutory meaning of “fair market value” is unclear, the agency has discretion to interpret the phrase in light of OCSLA’s overriding goal of balancing the nation’s environmental and energy interests, as well as the agency’s broad authority to prescribe lease provisions.

When recovering the fair market value for the right to explore and develop offshore resources, BOEM need not give away for free the options value or the right to inflict environmental and social externalities. In bidding on leases and developing those leases, private companies do not fully internalize the costs that offshore exploration and drilling impose on coastal and marine biota and habitats, air quality, property values, recreation, subsistence harvests, and commercial fishing.¹⁹ Greenhouse gases are also emitted unchecked during the process of energy production and transportation from offshore regions.²⁰ Liability regimes may cover some costs from catastrophic spills, but the public is never compensated for many significant environmental, health, and economic damages caused by exploration and drilling operations. Because lessees have externalized many costs of energy development onto the public, offshore energy deposits are currently developed at an inefficiently high rate. Similarly, current rents and royalties do not adequately incentivize companies to wait to drill until information on environmentally safer drilling techniques may emerge.

When leasing the rights to explore and develop offshore resources, the government is essentially granting private companies a free license to impose certain environmental and social externalities on the public. Simultaneously, the government is transferring a partially time-limited option to develop the resources to the private lessees; that transfer potentially extinguishes the valuable perpetual option the government currently holds on behalf of the American people.²¹

BOEM should adjust rents and royalties to ensure that the government actually collects a fair return for these valuable rights, and to restore the proper balance between efficient levels of offshore development and safeguarding environmental and social values. Increases could be based on average external costs generated by operations in each offshore planning region and the average options value for each region, taking into account the specific environmental and social sensitivities of the region. For greenhouse gases emitted during production, the agency can use the social cost of

¹⁵ 43 U.S.C. § 1344(a)(4).

¹⁶ BOEM, PROPOSED OUTER CONTINENTAL SHELF OIL & GAS LEASING PROGRAM: 2012-2017, at 161 (2011).

¹⁷ 43 U.S.C. § 1337(b)(6).

¹⁸ 43 U.S.C. § 1344(a).

¹⁹ See BOEM, FORECASTING ENVIRONMENTAL AND SOCIAL EXTERNALITIES ASSOCIATED WITH OCS OIL AND GAS DEVELOPMENT: THE REVISED OFFSHORE ENVIRONMENTAL COST MODEL (2012).

²⁰ See EPA, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2012, at 3-54 (2014).

²¹ See Livermore, *supra* note 3.

carbon framework to price the externality.²² Unlike the agency's current escalating rent schedule, which is designed to encourage faster development of leases, adjustments for options value and externalities should be fixed and designed not to incentivize over-early drilling.

(3) BOEM must make realistic assumptions about the consequences of delaying leases in particular regions.

BOEM should make realistic projections about the percent of leases that will result in energy production. Historically, companies have stockpiled some leases, choosing not to drill immediately due to the private options value of waiting. Therefore, postponing those leases would not immediately decrease production.

BOEM should make realistic projections about U.S. energy needs for domestic consumption. The United States is now a net exporter of certain petroleum products, and exports will increase with accelerating onshore production. BOEM should adjust its assumptions with respect to domestic energy needs accordingly.

BOEM should not assume that, in a no-sale alternative, 100% of the oil and gas that could have been generated over the next several decades from leases issued during this five-year program would have to be replaced immediately by energy substitutes. BOEM should continue working toward realistic assumptions about the potential to decrease domestic demand for energy, and the agency should consider that some foregone production could be offset by decreased exports. Additionally, BOEM should consider the possibility that future leases in the same offshore regions during future five-year programs, perhaps when more information exists about safer, more efficient drilling technologies, could compensate over the long term for some of the production foregone during temporary postponement.

Not all regions of the country experience the same costs and benefits from drilling versus postponement. In particular, if postponement of leasing in the Arctic forces the need for increased energy imports through shipping lanes along the Atlantic coast, the Arctic region will benefit even as the Atlantic region may face additional costs. Because OCSLA emphasizes regional differences and balances, BOEM should transparently disclose this regional distribution of costs and benefits and should not just report nationally averaged effects of drilling versus postponement. BOEM should give careful consideration to the uncertain environmental sensitivities and uncertain drilling and remediation technologies facing Arctic regions.

Respectfully submitted,

Institute for Policy Integrity at NYU School of Law

²² See Interagency Working Group on the Social Cost of Carbon, Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12,866 (2010). BOEM should further coordinate with other agencies on an administration-wide climate policy to address the greenhouse gases from the inevitable combustion of the oil and gas produced. Adjusting royalties to reflect the social cost of combustion could be one option.