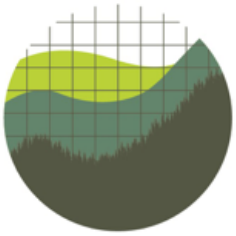

Institute *for*
Policy Integrity
NEW YORK UNIVERSITY SCHOOL OF LAW

April 21, 2016

Bureau of Land Management

VIA ELECTRONIC SUBMISSION

Attn: Docket ID No. BLM-2016-0001-0001

Re: Comments on Proposed Rule for Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. 6616 (proposed Feb. 8, 2016)

**Introduction**

The Institute for Policy Integrity respectfully submits the following recommendations to the Bureau of Land Management ("BLM") regarding its proposals to reduce waste of natural gas from venting, flaring, and leaks during oil and natural gas production on Federal and Indian leases.

The Institute for Policy Integrity at New York University School of Law[1] is a non-partisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in administrative law, economics, and public policy. The economics of natural resource extraction valuation and climate externalities are particular areas of focus for Policy Integrity.

BLM has proposed updating its regulations governing when natural gas lost through venting, flaring, or leaks during oil and gas production is subject to royalties. BLM's proposal includes, among other provisions, a preset rate limit on routine flaring, revision of the royalty rate to allow adjustments above the statutory floor of 12.5%, and operating standards for leak detection. BLM's action provides an opportunity to set requirements that will minimize waste to a level that maximizes social welfare. Waste of natural gas on BLM-regulated lands is a significant problem, and BLM has a statutory obligation to address it. While BLM's proposal is a step in the right direction, BLM should more thoroughly compare the social costs and benefits of its proposal with that of alternative approaches and select options that maximize social welfare.

In order to maximize social welfare, BLM should:

[1] No part of this document purports to present the views, if any, of New York University School of Law.

- Conduct a thorough cost-benefit analysis to identify the socially optimal standard for the routine flaring limit. This analysis should consider the social benefit of avoided flaring, expand the analysis timeframe beyond 10 years, focus on total net benefits rather than annual net benefits, analyze intermediate flaring limits, and consider a rate-based or mass-based standard combined with a flexible market approach.
- Adjust its alternative flaring limit and automatic exemption provisions to be consistent with its statutory duty to follow the principle of "multiple use."
- Increase royalty rates for future federal oil and gas leases to account for the environmental and social costs of oil and gas production.
- Set a socially optimal percentage for the proposed "adder provision" for flaring limits and conduct a comprehensive programmatic review of the oil and gas leasing program.

## I. BLM Should Conduct a Thorough Cost-Benefit Analysis to Identify the Socially Optimal Standard for the Routine Flaring Limit, Not Just a Socially Beneficial Standard

BLM has proposed a routine flaring limit of 1,800 Mcf/month/well averaged over a lease and has conducted an economic analysis showing that this standard is likely to be net socially beneficial.[2] However, BLM's methodology in performing its cost-benefit analysis appears to overlook key benefits associated with reduced flaring, and should either be clarified or revised in the final rule to ensure that the flaring standards fully reflect the benefits to the public of reducing this form of waste. In addition, and pursuant to Executive Orders, BLM should adopt the standard that maximizes social welfare, not just any standard that results in some net benefits to society.[3] The most efficient standard would: (1) include a numeric limit that is set by maximizing net social benefits and then (2) encourage the use of flexible market mechanisms, like trading, to achieve the standard most cost-effectively. BLM should determine the optimal numeric limit by analyzing additional alternative intermediate flaring limits in addition to the limits BLM already considered. Based on this optimal limit, BLM should also consider implementing a flexible approach, appropriately designed so that the effectiveness of the standard is not compromised.

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[2] Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. 6616, 6671 (proposed Feb. 8, 2016) (to be codified at 43 C.F.R. pts. 3100, 3160, 3170) ("Overall, the BLM estimates that the benefits of this rulemaking outweigh its costs by a significant margin."); *see also* BUREAU OF LAND MANAGEMENT, U.S. DEP'T OF INTERIOR, REGULATORY IMPACT ANALYSIS (FOR THE PROPOSED RULE) 60–61 (2016) [hereinafter REGULATORY IMPACT ANALYSIS], http://www.blm.gov/style/medialib/blm/wo/Communications_Directorate/public_affairs/news_release_attachments.Par.11216.File.dat/VF%20Regulatory%20Impact%20Analysis.pdf.

[3] Exec. Order No. 12,866, 58 Fed. Reg. 51,735, 51,735 (1993) ("[I]n choosing among alternative regulatory approaches, agencies should select those approaches that *maximize* net benefits . . . unless a statute requires another regulatory approach." (emphasis added)); Exec. Order No. 13,563, 76 Fed. Reg. 3821, 3821 (2011) (reaffirming the principles established in Executive Order 12,866, including maximization of net benefits).

### *BLM Should Correct, or More Transparently Explain, Its Cost-Benefit Methodology*

BLM's cost-benefit analysis may be flawed and should be improved in the following manner: (1) account for the social benefit of avoided carbon dioxide emissions resulting from reduced flaring; (2) expand the timeline over which the cost-benefit analysis is calculated; and (3) compare the proposed rule and alternatives based on *total* net benefits, not annual variations in net benefits.

First, it is not clear whether BLM has included all significant regulatory benefits in its cost-benefit comparison of alternative flaring limits. BLM estimates the impacts of all the proposed requirements and alternative approaches in section 7 of the regulatory impact analysis that accompanies the proposed rule.[4] The first subsection explains how BLM estimated the costs, benefits, and net benefits "for each of the proposed requirements."[5] Costs include "direct compliance costs and the social cost of additional carbon dioxide generated from combustion of gas produced (in lieu of venting that gas)."[6] Benefits include "the direct cost savings from recovered gas and the social benefit of *methane reductions* (from reduced venting)."[7] Net benefits are these benefits minus costs.[8]

In analyzing the rule to limit flaring, BLM accounted for the social benefit of avoided methane emissions but seems not to have done the same for the social benefit of avoided carbon dioxide emissions.[9] BLM specifically estimates there to be zero tons of methane reductions associated with the flaring requirements,[10] but does not address carbon dioxide reductions. For example, in Table 9e of the regulatory impact analysis, BLM lists the bases of the cost and benefit estimations for various flaring scenarios, none of which include the cost or benefit of the social cost of carbon.[11] As a result, BLM's analysis underestimates the benefits of the flaring limit as solely industry's cost-savings due to recovered gas.[12]

Although flaring does not generally involve the emission of methane, therefore supporting an estimate of no methane reductions, flaring does result in carbon dioxide emissions. Whereas venting is the direct release of gases into the atmosphere, flaring is instead the burning of gases, and carbon dioxide is a byproduct of the combustion. Therefore, when natural gas is flared, carbon dioxide is released into the atmosphere instead of methane.

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[4] REGULATORY IMPACT ANALYSIS, *supra* note 2, at 32.

[5] *Id.*

[6] *Id.*

[7] *Id.* (*emphasis added*).

[8] *Id.*

[9] *See* REGULATORY IMPACT ANALYSIS, *supra* note 2, at 60–68 (summarizing the costs and benefits associated with flaring limits of 1200, 1800, and 2400 Mcf/month/well averaged over a lease).

[10] *See id.* at 135 (noting in Table 38c that there are zero methane reductions due to the flaring requirements).

[11] *See id.* at 58–59.

[12] *See id.* at 60–68. On pages 60–61, BLM appears to calculate net benefits by calculating total costs minus total *cost savings*, leaving out the social benefit of avoided carbon dioxide emissions. In Tables 10, 11a, 11b, and 11c, on pages 62–68, BLM explicitly equates benefits to cost savings.

For this reason, while BLM reasonably estimates that no methane reductions occur when flaring is limited, BLM should account for the fact that reduced flaring is accompanied by reduced carbon dioxide emissions.

By not including the social benefit of avoided carbon dioxide emissions due to reductions in flaring, the cost-benefit analysis is incomplete. Executive Order 12,866 requires agencies to "assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs."[13] Regulatory best practices specified by the Office of Management and Budget (OMB) prompts agencies to "[i]dentify the expected undesirable side-effects and ancillary benefits of the proposed regulatory action and the alternatives. These should be added to the direct benefits and costs as appropriate."[14] The Interagency Working Group on Social Cost of Carbon has noted that "[t]he purpose of the 'social cost of carbon' (SCC) estimates . . . is to allow agencies to incorporate the social benefits of reducing carbon dioxide ($CO_2$) emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions."[15] As BLM notes, flaring gas contributes to greenhouse gas emissions, resulting in a negative climate externality.[16] Accordingly, BLM should include the social benefit of avoided carbon dioxide emissions due to reduced flaring of gas in its cost-benefit analysis. Furthermore, including all of the benefits of flaring limits may demonstrate that tighter limits are economically justified. If BLM has in fact accounted for the social costs or benefits of carbon dioxide emission reductions associated with its flaring limits, BLM should clearly and transparently explain the method it has used.

Second, BLM should improve its cost-benefit analysis by choosing a longer timeframe to cover the significant costs and benefits of the rule.[17] BLM has chosen to perform its cost-benefit analysis over a ten-year timeframe.[18] BLM justifies this time period by stating that "beyond the initial ten-year period, we expect the rule to have less of an impact. After the initial replacement of existing equipment that would be required by this rule, any other replacement or modification of such equipment would be subject to EPA's requirements that apply to new or modified sources . . . ."[19] Although BLM concludes that the rule will have less of an impact as time passes after the rule is in effect, it has not justified the

[13] Exec. Order 12,866, 58 Fed. Reg. 51,735, 51,736 (1993).

[14] OFFICE OF MGMT. & BUDGET, EXEC. OFFICE OF THE PRESIDENT, CIRCULAR A-4, at 3 (2003) [hereinafter OMB CIRCULAR A-4].

[15] INTERAGENCY WORKING GRP. ON SOC. COST OF CARBON, TECHNICAL SUPPORT DOCUMENT: TECHNICAL UPDATE OF THE SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866, at 2 (2013).

[16] REGULATORY IMPACT ANALYSIS, *supra* note 2, at 2.

[17] The reasoning presented for analyzing the flaring limit provision over a longer timeframe applies to the other provisions. Therefore, BLM should choose a longer timeframe in analyzing the costs and benefits of other provisions in the proposed rule as well, not just for flaring limits.

[18] REGULATORY IMPACT ANALYSIS, *supra* note 2, at 41.

[19] *Id*.

specific ten-year timeframe. The ten-year timeframe is arbitrary based on the estimates of costs and benefits that BLM presents for years 2017–2026.[20]

As an example, assume that EPA finalizes Subpart OOOOa and uses a 3% discount rate in its economic analysis. Accordingly, in the last three years of the ten-year timeframe, 2024, 2025, and 2026, the annual estimated costs of the rule are $126, $125, and $125 million, respectively.[21] The annual estimated benefits are $322, $356, and $357 million, respectively.[22] The annual estimated total net benefits are $196, $231, and $232 million, respectively.[23] Based on these numbers, there is no indication that costs, benefits, and net benefits are estimated to trend off to insignificant levels at the ten-year mark. In fact, the net benefits are greatest in the last two years of the ten-year timeframe. In the tenth year (2026), BLM's rule is still producing a significant net benefit of $232 million.[24] To cut off the timeframe at the ten-year mark, and for such a cutoff to not be arbitrary, the assumption must be that in the following year, 2027, there will be a significant decline of the rule's impact, ostensibly due to the replacement of existing sources with new and modified sources. However, a scenario where industry goes from operating a significant number of existing sources in 2026 to almost no existing sources in 2027 seems unlikely, or at least unsupported. Therefore, BLM's conclusion—that, after 10 years, most sources will be new or modified, subject to EPA's rules for new and modified sources, and BLM's rule will have little effect—seems unjustified. BLM should transparently explain why a steep drop off in existing sources between 2026 and 2027 is the correct assumption. Otherwise, BLM should acknowledge that not all existing sources will have retired or been modified by 2026, and extend the cost-benefit analysis timeframe to a cutoff year where the impact of the rule has in fact fallen to an insignificant level.

On a more general level, the distinction between existing, new, and modified sources seems misplaced because Subpart OOOOa does not contain standards for routine flaring of associated gas. Furthermore, even if the distinction matters, BLM is analyzing the rule under two assumed cases: EPA does not finalize Subpart OOOOa, and EPA does finalize Subpart OOOOa.[25] BLM's assumption that the ten-year timeframe is appropriate because new and modified sources will instead be subject to EPA's rule does not address the case where EPA does not finalize Subpart OOOOa.

As discussed earlier, agencies are required to account for significant costs and benefits of a proposed rule. *Circular A-4* instructs that "[t]he time frame for your analysis should cover a period long enough to encompass all the important benefits and costs likely to result from the rule."[26] By picking a ten-year timeframe, BLM arbitrarily ignores significant benefits

[20] *See, e.g.*, *id*. at 128–29, 131–36.

[21] *Id*. at 129.

[22] *Id*. at 134.

[23] *Id*. at 139.

[24] *Id*. at 134.

[25] REGULATORY IMPACT ANALYSIS, *supra* note 2, at 4–8.

[26] OMB CIRCULAR A-4, *supra* note 14, at 15.

that seem likely to occur beyond the ten-year timeframe. BLM should therefore reconsider the ten-year timeframe so that it fulfills its obligation to thoroughly account for the costs and benefits of the proposed rule.

Third, BLM should compare the proposed rule and alternatives based on their *total* net benefits, not the range of annualized net benefits.[27] For example, BLM summarizes the net benefits for the 1,800 Mcf/month/well averaged over a lease standard as a range from -$10 million to +$8 million per year using a 7% discount rate.[28] This range reflects the fact that BLM estimated a net benefit of $8 million in 2017 and a net benefit of -$10 million in 2019, and all other years are associated with net benefits that fall between -$10 and $8 million. For the 1,200 Mcf/month/well averaged over a lease standard, the net benefits range from -$16 million to +$1 million per year using a 7% discount rate.[29] For the 2,400 Mcf/month/well averaged over a lease standard, the net benefits range from -$7 million to +$10 million using a 7% discount rate.[30] These range numbers reflect the lowest and the highest net benefits for a given year between 2017 and 2026.[31] Summarizing the net benefits in this manner is confusing and misleading. Determining which standard is optimal should be based on maximized *total* net benefits, not the range of annualized net benefits.

For example, BLM should present that the estimated total net benefits under the 1,800 flaring limit over the ten-year analysis timeframe under a 7% discount rate is -$14 million.[32] Likewise, the summary of impacts should include the other total net benefits: -$59 million (1,200 / 7% discount rate); $283 million (1,200 / 3% discount rate); $6 million (2,400 / 7% discount rate); and $227 million (2,400 / 3% discount rate). The most efficient standard should be identified based on these total net benefit numbers (and the total net benefit numbers for the alternative standards that BLM should additionally analyze, as discussed below).

While *Circular A-4* does recommend presenting the annual stream of costs and benefits, the ultimate goal of cost-benefit analysis is to "identify the alternative that maximizes net benefits."[33] Accordingly, BLM should more transparently explain and present the total net benefits of the proposed rule and alternatives in its summary of the cost-benefit analysis.

### *BLM Should Find the Optimal Standard by Examining Intermediate Alternatives*

BLM conducted an economic analysis for the proposed flaring limit standard of 1,800 Mcf/month/well averaged over a lease, as well as for a lower alternative limit of 1,200

[27] The reasoning presented applies to the other provisions. Anywhere BLM summarizes net benefits, it should provide and focus on total net benefits, not the range of annualized net benefits.

[28] REGULATORY IMPACT ANALYSIS, *supra* note 2, at 60.

[29] *Id.*

[30] *Id.* at 61.

[31] *Id.* at 63–68.

[32] Negative fourteen million dollars is calculated by adding up the annual net benefits (for a 7% discount rate) in Table 11a on page 64 or the regulatory impact analysis. *See* REGULATORY IMPACT ANALYSIS, *supra* note 2, at 64.

[33] OMB CIRCULAR A-4, *supra* note 14, at 10.

Mcf/month/well averaged over a lease and a higher alternative limit of 2,400 Mcf/month/well averaged over a lease.[34] Among the three options, BLM concluded that at a 3% discount rate, the 1,200 standard results in the greatest net social benefit, and at a 7% discount rate, the 2,400 standard results in the greatest net social benefit. BLM therefore chose 1,800 because "it maximizes net benefits at a mid-point discount rate."[35]

BLM, however, should do further analysis before concluding that it has chosen the limit that maximizes net benefits. In comparing the net benefits of a proposed rule and alternatives, the same discount rate should be used, or otherwise the cost-benefit analyses are not comparable.[36] The analysis of comparing alternatives can be repeated using different discount rates, especially when it is unclear what constitutes the correct discount rate to use.[37] But determining the correct discount rate is a separate issue from determining whether the proposed rule or an alternative rule promises the maximum net benefits.

BLM should specify which discount rate it is using to compare among alternatives, and use that discount rate consistently for each option.[38] Although BLM asserts that the 1,800 limit maximizes net benefits at a mid-point discount rate, BLM did not conduct a cost-benefit analysis at that mid-point discount rate for the 1,800 Mcf/well/month averaged over a lease limit. Nor did BLM conduct a cost-benefit analysis at the mid-point discount rate for the alternative standards of 1,200 Mcf/well/month averaged over a lease and 2,400 Mcf/well/month averaged over a lease. Therefore, BLM does not have the basis for and cannot presently conclude, as it has, that 1,800 Mcf/well/month averaged over a lease "maximizes net benefits at a mid-point discount rate."[39]

In addition, even if BLM shows that 1,800 Mcf/well/month averaged over a lease provides the greatest net benefit *among the three considered standards (1,200/1,800/2,400)*, BLM should examine whether there are *intermediate alternatives*—for example, limits between 1,200 and 1,800 or between 1,800 and 2,400— or even a limit lower than 1,200, that provide even greater net benefits. As *Circular A-4* states, "[b]y measuring incremental benefits and costs of successively more stringent regulatory alternatives, you can identify the alternative that maximizes net benefits."[40] BLM should adopt a standard because it

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[34] REGULATORY IMPACT ANALYSIS, *supra* note 2, at 60–61.

[35] *Id.* at 61.

[36] As the Office of Management and Budget (OMB) notes, discounting "transforms gains and losses occurring in different time periods to a common unit of measurement," and is calculated by "using an appropriate discount rate." OFFICE OF MGMT. & BUDGET, EXEC. OFFICE OF THE PRESIDENT, CIRCULAR A-94: GUIDELINES AND DISCOUNT RATES FOR BENEFIT-COST ANALYSIS OF FEDERAL PROGRAMS, at 4 (1992). "[D]iscounting reflects the time value of money." *Id.* at 8. There is no reason that the time value of money should be different depending on how much one can flare.

[37] OMB's *Circular A-4* suggests agencies "should provide estimates of net benefits using both 3 percent and 7 percent." OMB CIRCULAR A-4, *supra* note 14, at 34. *Circular A-4* also notes that other discount rates can be used "to show the sensitivity of the estimates to the discount rate assumption." *Id.* at 33.

[38] BLM should be more explicit about what discount rate it is using. *Circular A-4* directs agencies, "[f]or transparency's sake, . . . should state in [their] report what assumptions were used, such as . . . the discount rates applied to future benefits and costs." OMB CIRCULAR A-4, *supra* note 14, at 3. BLM states "a mid-point discount rate," which can mean 5% but is unclear.

[39] REGULATORY IMPACT ANALYSIS, *supra* note 2, at 61.

[40] OMB CIRCULAR A-4, *supra* note 14, at 10.

results in the maximum amount of net benefits, not because it performs the best out of three options.

The appropriate numerical standard should be one that takes advantage of the technological progress made in the past few decades. As BLM has explained, revising the flaring requirements is driven in part by significant technological development that enables operators to reduce waste more cost-effectively.[41] Yet, the limit BLM has proposed is the same numeric limit that Utah had in place at least more than 18 years ago.[42] Given that Utah's 1,800 Mcf/month/well standard was deemed an appropriate flaring limit almost two decades ago, BLM should analyze alternatives to its 1,800 Mcf/month/well averaged over a lease limit and ensure that its proposed standard is truly the most efficient standard given technological advancement. Furthermore, even though the Utah standard has the same numerical limit, it applies directly to each well, rather than averaged across a lease like BLM's proposed standard. Utah's standard is therefore more stringent, as BLM has noted.[43] BLM's proposed standard of 1,800 Mcf/month/well averaged over a lease, which is less stringent that a standard that was in place at least 18 years ago before the development of current technology, seems unlikely to be the most efficient standard for the present day.[44]

By conducting a comprehensive cost-benefit analysis, BLM might find that a different flaring limit—other than 1,200, 1,800, and 2,400—optimizes net social benefits.

### *BLM Should Consider Implementing a Flexible Standard—Such as a Rate-Based or Mass-Based Standard—Without Compromising the Standard's Effectiveness*

BLM should consider redesigning its flexible standard to ensure socially efficient action under the rule, for example, by using a mass-based or rate-based standard. BLM has

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[41] Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. 6616, 6627 (proposed Feb. 8, 2016) (to be codified at 43 C.F.R. pts. 3100, 3160, 3170) ("BLM's existing requirements on venting and flaring are more than 3 decades old, do not reflect technological advances and current scientific understanding, [and] have failed to deter rising looses of gas . . . ."); *id.* at 6628 ("Over the past 36 years since NTL-4A was issued, technologies and practices for oil and gas production have advanced considerably."); *id.* at 6618 ("BLM has an independent legal responsibility . . . to oversee oil and gas production activities on Federal and Indian leases. The BLM has requirements in place, but as independent reviews have pointed out, the existing requirements pre-date, and thus do not account for, significant technological developments. Updating and clarifying the regulations will make them more effective, more transparent, and easier to understand and administer, and will reduce operators' compliance burdens in some respects.").

[42] An unofficial May 2005 copy of Utah rules shows that the 1,800 Mcf/month/well limit appears to have been in effect in 2005. *See* UTAH DIVISION OF OIL, GAS & MINING, FINAL DRAFT COPY OF THE OIL AND GAS CONSERVATION GENERAL RULES (2005), https://oilgas.ogm.utah.gov/pub/Notices/R649-NonSub_Changes.pdf. An archived online webpage of Utah's rules indicates that the limit was in effect on February 1, 2003. *See* INTERNET ARCHIVE, *Rule R649-3. Drilling and Operating Practices* [*Archived*], https://web.archive.org/web/20030418091500/http://www.rules.utah.gov/publicat/code/r649/r649-003.htm. A search through Utah's State Bulletin issues that are available online seem to indicate no amendments made to the rule (R649-3-20) since at least as far back as 1998. *See Utah State Bulletin*, UTAH.GOV, http://www.rules.utah.gov/publicat/bulletin.htm (last visited Mar. 4, 2016).

[43] Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. at 6640 ("As applied, the numeric limit proposed by the BLM would be somewhat less stringent than the State limits, because operators would be able to average flaring across all of the wells on a lease . . . .").

[44] In addition to examining whether a more stringent standard is the correct standard, BLM should consider a flaring limit that continues to decrease over time (or commit to reevaluating the limit after a few years of implementation) in order to keep pace with technological development and infrastructure deployment.

proposed a flexible flaring limit that is averaged over leases (1,800 Mcf/month/well *averaged over a lease*).[45] In general, flexible standards and market-oriented approaches are efficient because they allow regulated entities to use the most cost-effective means to attain compliance. Executive Order 13,563 directs agencies to consider regulatory approaches that "maintain flexibility and freedom of choice for the public"[46] and use of "economic incentives to encourage the desired behavior, such as . . . marketable permits."[47] OMB instructs that best regulatory practices require consideration of flexible standards and market approaches.[48] Most economists agree that the most efficient method to reduce greenhouse gas emissions is to use market-based mechanisms, such as tradable allowances or price-based approaches like taxes or royalties.[49] However, flexible standards should be designed so that the flexibility does not present opportunities for inefficient exploitation. BLM's proposed standard based on a per-well limit averaged over a lease risks creating undesirable incentives.

As an example, assume a lease has two wells on it and assume the first well is relatively dry—e.g., producing only 100 Mcf/month of associated gas. Because the proposed limit is 1,800 Mcf/well/month averaged over a lease, if only 100 Mcf/month of gas is flared from the first well, the second well can flare up to 3500 Mcf/month. As long as an operator continues to operate a less productive well, the operator may not need to reduce flaring for other wells. In fact, an operator may be incentivized to continue operating relatively unproductive wells[50] on a lease specifically for this reason despite the costs of running a well.[51] Furthermore, as BLM has noted, wells usually experience rapid decline of oil and gas production over time.[52] For example, in the Bakken Formation, production peaks in the

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[45] *Id.* at 6640.

[46] Exec. Order No. 13,563, 76 Fed. Reg. 3821, 3822 (2011).

[47] *Id.* at 3821.

[48] OMB CIRCULAR A-4, *supra* note 2, at 7–9 (listing flexible performance standards and market-oriented approaches as alternative regulatory actions that agencies should consider).

[49] *See* J. Scott Holladay et al., INST. FOR POLICY INTEGRITY, *Economists and Climate Change: Consensus and Open Questions* 14 (2009) (Nearly all respondents [of expert economists]—92%—also agreed or strongly agreed that market-based mechanisms, as opposed to command-and-control approaches, are the preferred way to cut greenhouse gas emissions . . . ."); *see also* Nathaniel O. Keohane, *Cap and Trade, Rehabilitated: Using Tradeable Permits to Control U.S. Greenhouse Gases*, REVIEW OF ENVIRONMENTAL ECONOMICS AND POLICY ADVANCE ACCESS, Winter 2009, at 42, 42 ("Emissions trading . . . [,] long restricted to academic wish lists, is now the presumptive method for new regulation of pollution in the United States.").

[50] As long as a development well contributes production for at least 10 days during a month, the lease is allowed additional flaring up to the proposed limit. Proposed 43 CFR § 3179.6(b) states: "[A]n operator must not flare or vent gas in excess of the [proposed flaring limit], representing the total volume of gas flared or vented over a production month from all development oil wells on a lease, unit, or CA, divided by the number of development oil wells contributing production for at least 10 days during that month . . . ." Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. at 6682.

[51] Whether an operator chooses to do this depends of course in part on the specific costs and incentives involved for the operator. This private calculation, however, would not take into account the social costs and benefits the decision would impose.

[52] Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. at 6638 ("New wells (especially in shale formations) often start out producing a relatively large amount of oil and/or gas at relatively high pressures, which then declines rapidly over time."); *see also* REGULATORY IMPACT ANALYSIS, *supra* note 2, at 51–52, "[A]ssociated gas production naturally declines . . . [with] the rather sharp production declines that many of [the] wells experience."

second month and declines to 64% within one year and 86% within two years.[53] Because any given well is expected to rapidly and naturally decline in production, a standard that allows for averaging over wells on a lease potentially creates an incentive to keep less productive wells open and thus avoid flaring limits on newer wells.

To support the flexibility of averaging over a lease, BLM notes that the "flexible approach incorporates some of the flexibility allowed by North Dakota, where operators can show compliance with the State's flaring limits on a field, county, or state-wide basis."[54] However, North Dakota's standard incorporates a *rate-based* limit that requires operators to capture *a certain percentage of their gas production*.[55] In the example situation of two wells producing gas at the rate of 100 Mcf/month and 1,800 Mcf/month, and assuming a rate-based standard where 80% of the associated gas must be captured, an operator would be limited to flaring at most 380 Mcf/month. The operator cannot avoid reducing wasteful flaring merely because one of the wells is producing relatively little. But within the flexible rate-based limit, the operator can choose how to allocate the flaring reductions among the wells in the most cost effective way while still providing the social benefit of reduced flaring.

In contrast, BLM's proposed standard is not a rate-based standard (or a mass-based standard). Instead, BLM's proposed standard sets a fixed permissible flaring rate for each well and allows for flexible shifting of reduction burdens, largely irrespective of the production state of the wells or a socially optimal amount of aggregate flaring.[56] Setting a limit independent of the amount of expected production benefits or a socially optimal amount of aggregate flaring is arbitrary, particularly given the uncertainty of the amount each well affected by the rule will be flaring.[57]

BLM should still implement a flexible standard that allows for averaging and/or trading of flaring (carbon dioxide) reductions between wells and also between leases. But to ensure that such a scheme is efficient, BLM should set a mass-based or rate-based standard instead of a well-based standard. With a mass-based or rate-based standard, the flaring limit is optimized relative to production rates or a total optimal flaring amount. Therefore, the same amount of flaring reductions must occur for a given production amount (rate-based) or as an absolute total (mass-based). Combining the limit with a flexible averaging scheme, operators can choose to reduce flaring on sites where it is most cost-effective. Under market-based approaches, like a trading scheme, operators would be further incentivized

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[53] *Id.* at 52.

[54] Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. at 6640.

[55] *Id.* at 6634.

[56] For example, the socially optimal amount of aggregate flaring might be the amount of flaring that balances the total compliance costs of avoiding flaring and the total social costs of carbon dioxide emissions due to flaring.

[57] REGULATORY IMPACT ANALYSIS, *supra* note 2, at 43 (noting uncertainty of the impacts estimate due to variation in site-specific characteristics); *id.* at 49–59 (describing the impact modeling and the "numerous and highly uncertain factors" involved such that "even this broad range of possible impacts may not accurately model the actual effects of this provision").

to reduce flaring cheaply and sell allowances to other leaseholders, thereby reducing overall costs to the industry.[58]

Because flexible standards and market approaches encourage operators to explore cheaper ways to meet a given standard, the standard might be made more stringent. That is, to the extent that a standard can be more cheaply met, a more stringent standard could be justified under cost-benefit analysis. If BLM includes flexibility and market-based approaches like trading in the flaring standard, BLM should determine a socially optimal limit that accounts for any cost-efficiencies gained from flexible and market-based approaches. In fact, BLM should provide this analysis for its currently proposed flexible standard of averaging over a lease. BLM has already identified that averaging over a lease reduces the limit's stringency compared to Wyoming's and Utah's flaring standards.[59] BLM should complete the analysis by, for example, considering whether averaging over a lease can be combined with a lower rate of flaring (given that Utah's flaring limit is equivalent to 1,800 Mcf/month/well, *with no averaging*) for a socially optimal standard.

The Mineral Leasing Act of 1920 requires that each lease BLM issues "shall contain . . . a provision that such rules . . . for the prevention of undue waste as may be prescribed by said Secretary shall be observed."[60] The statute also "requires the BLM to ensure that lessees 'use all reasonable precautions to prevent waste of oil or gas developed in the land . . . .'"[61] BLM is broadly authorized to limit waste of resources from BLM-administered leases. The statute imposes no specific restrictions on how the Secretary chooses to prevent waste. This broad authorization, combined with the requirement of Executive Order 13,563 to consider flexible standards and market-based approaches,[62] counsels BLM to consider a rate-based or mass-based standard with a properly optimized limit, combined with an averaging or trading scheme, in order to arrive at the most efficient flaring limit standard.

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[58] NAT'L CENTER FOR ENVTL. ECON., OFFICE OF POLICY & EPA, GUIDELINES FOR PREPARING ECONOMIC ANALYSES 4–5 (2014) ("Market-oriented approaches . . . create an incentive for the private sector to incorporate pollution abatement into production or consumption decisions and to innovate in such a way as to continually search for the least costly method of abatement. . . . [M]any market-based approaches minimize polluters' abatement costs, an objective that often is not achieved under command-and-control based approaches. Because market-based approaches do not mandate that each polluter meet a given emissions standard, they typically allow firms more flexibility than more traditional regulations and capitalize on the heterogeneity of abatement costs across polluters to reduce aggregate pollution efficiently. Environmental economists generally favor market-based policies because they tend to be least costly . . . .").

[59] Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. at 6640 ("[The] proposed limit is consistent with Wyoming's and Utah's approaches: Wyoming and Utah limit flaring from a well to 60 Mcf/day and 1,800 Mcf/month, respectively, unless the operator obtains State approval of a higher limit. As applied, the numeric limit proposed by the BLM would be somewhat less stringent than the State limits, because operators would be able to average flaring across all of the wells on a lease, rather than being required to meet the limit at each individual well.").

[60] 30 U.S.C. § 187 (2012).

[61] Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. at 6616 (citing 30 U.S.C. § 225).

[62] Exec. Order No. 13,563, 76 Fed. Reg. 3821, 3821–22 (2011) (setting out, in section 4, that agencies shall "maintain flexibility and freedom of choice for the public" and, in section 1, must identify and assess "economic incentives to encourage the desired behavior, such as . . . marketable permits.").

## II. BLM Should Adjust Its Alternative Flaring Limit and Automatic Exemption Provisions to be Consistent with Its Statutory Duty to Follow the Principle of "Multiple Use"

BLM has proposed allowing existing leases to receive alternative flaring limits or exemptions for situations under which BLM deems it would be *uneconomic for the operator* to meet the flaring requirements. However, BLM should instead apply alternative flaring limits and flaring exemptions that are consistent with the statutory principle of "multiple use," and maximize total net social welfare, rather than favoring industrial interests.

### *BLM Should Clarify the Conditions Under Which It Will Grant Alternative Flaring Limits, Allowing Alternative Flaring Limits Only When They Maximize Net Social Welfare*

BLM has proposed that a lease qualifies for an alternative flaring limit when the proposed flaring limit in the regulations "would impose such costs as to cause the operator to cease production and abandon significant recoverable oil reserves under the lease." This cause-to-abandon standard appears to assume that extracting a reserve of oil is always justified as long as output is large, and that an alternative limit should be granted even if the total social welfare costs of extraction and greater flaring were to outweigh the benefits of extraction. This subsidization of the oil and gas industry is contrary to the "multiple use" principle that BLM is statutorily directed to follow and regulatory principles of social welfare maximization.

The Federal Land Policy and Management Act directs BLM to manage public lands based on the principle of multiple use.[63] "Multiple use" refers to the management of public lands and associated resources "so that they are utilized in combination that will best meet the present and future needs of the American people.[64] "Multiple use" also means "a combination of balanced and diverse resource uses that take into account the long-term needs of future generations for renewable and nonrenewable resources."[65] And "multiple use" also comprises "harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment, with consideration being given to the *relative values* of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output."[66]

BLM could better align its rule with the statutory requirement of multiple use by granting alternative flaring limits based on a cost-benefit analysis. The multiple-use principle strives for a balancing of uses for present needs, future needs, the American public, productivity,

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[63] Federal Land Policy and Management Act of 1976 §§ 102(a)(7), 202(c)(1), 302(a); 43 U.S.C. §§ 1701(a)(7) 1712(c)(1), 1732(a) (2012); *see also* JAYNI FOLEY HEIN, INSTITUTE FOR POLICY INTEGRITY AT NYU SCHOOL OF LAW, HARMONIZING PRESERVATION AND PRODUCTION 4–5 (2015).

[64] Federal Land Policy and Management Act § 103(c).

[65] *Id.*

[66] *Id.* (emphasis added).

environmental quality, and economic return.[67] Cost-benefit analysis is an apt tool for determining how to balance between these uses because cost-benefit analysis allows for evaluation of different options with a variety of attributes using a common measure,[68] and accounts for future benefits as well as present ones.[69] The combination that maximizes net benefit is the most efficient one.[70] Cost-benefit analysis therefore provides one transparent method of selecting a particular balance of uses to achieve the goal of "multiple use." Furthermore, considering options based on a cost-benefit analysis is consistent with regulatory best practices under Executive Order 13,563.[71]

Specifically with flaring limits, some situations could justify alteration of the limit because allowing drilling, extraction, and greater flaring generates benefits that outweigh the costs of these activities and their attendant externalities. In other situations, social welfare may be maximized if the operator is not permitted to extract the reservoir of resources unless it can meet the flaring limits in the regulation—that is, it is preferable to in fact "abandon significant recoverable oil reserves under the lease."

While keeping in mind the goal of maximizing net social benefit and the multiple-use principle, BLM should at least clarify when an alternative flaring limit is justified because the default limit "would impose such costs as to cause the operator to cease production and abandon significant recoverable oil reserves under the lease." For example, BLM should clarify what constitute "significant" and "abandon[ment]" and "would impose such costs as to cause the operator to cease production and abandon significant recoverable oil reserves under the lease."

"Significant" is a vague standard, and BLM has not provided information about what might be significant. To align with the multiple-use principle and regulatory best practices of maximizing social welfare, a possible definition for "significant" recoverable oil reserves could be those reserves that, when recovered, result in significant social net benefit based on a cost-benefit analysis.

For "abandon[ment]," BLM should clarify against what timeframe abandonment is determined. Reserves that are not extracted in a year or two should not necessarily be considered abandoned. In fact, delaying exploitation of an oil reserve may provide option value to leaseholders—"the value of waiting to make an irreversible decision until critical new information arrives."[72] For example, waiting may allow for obtaining "greater

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[67] *See id.*

[68] OMB CIRCULAR A-4, *supra* note 14, at 10.

[69] *Id.* at 31–32 (discussing the calculation of benefits and costs that occur in different time periods).

[70] *Id.* at 2.

[71] Exec. Order No. 13,563, 76 Fed. Reg. 3821, 3821 (2011) ("[Our regulatory system] must take into account benefits and costs, both quantitative and qualitative. . . . [E]ach agency must . . . select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity) . . . .").

[72] HEIN, *supra* note 63, at 3; OMB CIRCULAR A-4, *supra* note 14, at 39 ("Real options" methods . . . formaliz[e] 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 potential costs of a sunk

information about environmental, social, economic, and technological uncertainties, such as energy prices, extraction costs, and environmental sensitivities," that may change the cost-benefit calculation about when or whether to extract resources, both from a societal perspective and from the perspective of the leaseholders.[73] The private sector has routinely accounted for option value with respect to offshore leases.[74] BLM should, therefore, set out a standard of abandonment that recognizes the option value of delay. That is, some delay should not necessarily constitute abandonment.

Clarifying "significant" and "abandonment" provides BLM an opportunity to ensure that its standard for granting alternative flaring limits is in line with the statutory principle of multiple use and the regulatory principle of maximizing social welfare. In addition, BLM should provide information about what constitutes the cause-to-abandon standard so that expectations are clear to regulated entities and the public, lessening the possibility for special interests to take advantage of the vagueness of the standard and receive inappropriate limit alterations.

### *BLM Should Reconsider the Scope of Its Automatic Exemptions Provision or Clarify Its Justifications for These Exemptions*

BLM has proposed giving an automatic exemption to an existing lease where (1) the lease is not connected to a gas pipeline; (2) the closest point on the lease is located more than 50 straight-line miles from the nearest gas processing plant; and (3) the rate of flaring or venting from the lease exceeds the applicable flaring limit by at least 50%. BLM has failed to sufficiently explain why these conditions warrant an automatic exemption.

BLM has noted that availability of on-site capture to avoid wasted gas and that "[t]he economics of alternative on-site capture technologies improve *as quantities of gas increase*."[75] Yet, BLM is providing automatic exemption specifically to those wells flaring *a significant amount of gas* (50% more than the flaring limit). The economics of alternative on-site capture would, therefore, seem to favor capture at some of these wells that are producing significant amounts of gas.

Additionally, BLM supports the automatic exemption by noting that a 2015 study by Carbon Limits suggests that on-site capture is the most cost-effective within a 20- to 25-mile radius of gas processing facilities. BLM has noted that "[e]xisting leases located more than 50 miles from such facilities are thus unlikely to avail themselves of this technology."[76]

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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.").

[73] HEIN, *supra* note 63, at 3; *see also* BUREAU OF OCEAN ENERGY MGMT., 2017–2022 OUTER CONTINENTAL SHELF OIL AND GAS LEASING PROPOSED PROGRAM 10-4 (2016) ("When uncertainties exist, having the option to delay activities creates value as more information can be revealed and acted on in the future. . . . The decision regarding exercising the option at a particular time can reflect price volatility as well as emerging information about resources, costs, and risks when the social value of the option is in question.");

[74] HEIN, *supra* note 63, at 14 & n.105.

[75] Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. 6616, 6639 (proposed Feb. 8, 2016) (to be codified at 43 C.F.R. pts. 3100, 3160, 3170) (emphasis added).

[76] REGULATORY IMPACT ANALYSIS, *supra* note 2, at 52.

Yet, the Carbon Limits study shows that there are scenarios for which a well that is more than 50 miles away from the nearest gas processing plant could feasibly employ capture technologies, specifically natural gas liquid (NGL) recovery.[77] NGL recovery refers to separating out from associated gas, heavier hydrocarbons, such as propane, butane, and pentane, which can easily be transported as liquids.[78] NGL recovery technology is particularly relevant since "[a]ssociated gas at well pads typically contains significant amounts of [NGL-type natural gas]."[79] BLM should therefore clarify why a categorical exemption for these wells is justified.

As with the alternative limit provision, there appears to be an underlying assumption that significant reduction in production is automatically undesirable. BLM has explained that "while operators could respond to the flaring limit by deferring production, that is unlikely to be an option for operators on existing leases that are flaring more than 50 percent above the applicable limit."[80] This is because "reducing flaring below the limit would require reducing production by one-third or more."[81] BLM therefore concludes that "leases meeting these distance and flaring rate criteria should qualify for an automatic exemption from the flaring limit."[82] BLM, however, would be more in line with its statutory mandate to follow the principle of multiple use—to balance the relative values of profits and output with environmental and other interests[83]—if it conducted a cost-benefit analysis that compared the case of foregoing resources extraction with the case of allowing resources extraction and lowering the burden of the flaring limit.

As an additional concern, the automatic exemption potentially creates perverse incentives. If, for example, a lease meets the first two criteria for the exemption, but is flaring at 45% above the limit, an operator might try to *increase its flaring* another 5% to automatically qualify for exemption.

The category of wells that meet the conditions for the automatic exemption appears to be relatively small. The tables in the regulatory impact assessment shows that of the sample dataset, 4 leases fall within the category out of 2,310 leases.[84] Therefore, BLM might find it administratively feasible to process exemptions for these leases on a case-by-case basis. Since these leases are significant contributors of flaring (flaring at above 50% of the limit), there are compelling reasons to scrutinize these leases more carefully for whether flaring reduction is in fact possible instead of applying exemptions automatically. Alternatively, BLM should consider requiring operators to demonstrate that on-site capture and processing of gas is infeasible as an alternative to granting automatic exemptions. In addition, even if BLM decides that an automatic exemption is the correct rule, BLM should

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[77] *Id.*

[78] CARBON LIMITS, IMPROVING UTILIZATION OF ASSOCIATED GAS IN US TIGHT OIL 2 (2015).

[79] *Id.* at 8.

[80] Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. at 6641.

[81] *Id.*

[82] *Id.*

[83] *See supra* notes 63–66.

[84] REGULATORY IMPACT ANALYSIS, *supra* note 2, at 54–56.

consider whether a lease should not be exempted if it is within a minimum distance to a pipeline, given that an operator could build out a pipeline to join close-by existing pipeline infrastructure.

## III. BLM Should Increase Royalty Rates on New Leases to the Socially Optimal Level

While the proposal to allow for flexible royalty rates going forward is a significant improvement over BLM's current practices, BLM should ensure that royalty rates on future competitive leases are set at the socially optimal level. BLM can determine the socially optimal royalty rate through a new rulemaking, or by conducting a comprehensive programmatic review of the federal onshore oil and gas leasing program. BLM's authority, and statutory duty, to set royalty rates is found in the Mineral Leasing Act of 1920 (MLA), which requires royalties on competitively issued leases on federal lands to be set "at a rate of *not less than* 12.5% in amount or value of the production removed or sold from the lease."[85]

While BLM has historically chosen not to set royalty rates above the statutory floor of 12.5%, the proposed rulemaking to allow increased royalty rates in the future on new, competitive leases is a significant step towards achieving an optimal regulatory framework. BLM's proposal both takes advantage of the flexibility inherent in the plain text of the statute, which requires only that the royalty rate be set at 12.5% *or higher*, and provides the agency with regulatory space to review the current royalty rate scheme and revise the rate to the socially optimal level.

BLM's current practice of using a flat 12.5% royalty rate on new competitive leases may fail to adequately account for the environmental and social costs of oil and gas production and may not ensure that taxpayers receive a fair share in return for the leaseholders' use of valuable public resources. Indeed, the fact that the average royalty rate charged for oil and gas activities on state and private lands is 16.67%[86] may suggest that BLM is neither imposing the socially optimal royalty rate on its leaseholders nor receiving a fair return for taxpayers. BLM's proposal to adopt a flexible royalty rate going forward on new competitive leases not only aligns with a natural reading of the MLA, but also allows BLM to revise the royalty rate and account for the following costs resulting from oil and gas production: (1) environmental externalities, including air pollution, water pollution, noise, habitat degradation, and other costs imposed on the environment; (2) environmental and social costs of methane emissions specifically, as quantified and expressed by the social cost of methane; and (3) all other applicable social costs.[87]

BLM should adopt an increased royalty rate for new leases that reflects the externalities of oil and gas production and ensures that BLM is receiving a fair share for taxpayers. BLM could do this through issuing a new rulemaking to revise royalty rates for new oil and gas leases. Alternatively, BLM could conduct a comprehensive programmatic review—similar

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[85] 30 U.S.C. § 226(b)(1)(A), (c)(1) (emphasis added).

[86] *See* Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. at 6659 (citing 80 Fed. Reg. 22,148, 22,151–52 (April 21, 2015)).

[87] *See* HEIN, *supra* note 63, at 2–3, 20–23.

to the one recently announced for the federal coal program—to set a socially optimal royalty rate for federal onshore oil and gas leases going forward. As part of this comprehensive review, BLM should account for the social cost of methane, a metric that quantifies the externalities created by methane emissions associated with oil and gas production.[88] Externalities are the effects imposed on society and the environment that are not accounted for in the market.[89] In revising its decades-old royalty rates for onshore oil and gas leases, BLM should take the opportunity to account for the many externalities associated with oil and gas production.

### *BLM Should Conduct a Programmatic Review of the Onshore Oil and Gas Leasing Program*

To ensure that royalty rates on future leases are set at the socially optimal amount, BLM should first implement the proposed flexibility in the final rule and then conduct a thorough review of its oil and gas leasing program similar to the one that the Department of Interior is conducting on the federal coal program.[90] On January 15, 2016, the Secretary of the Interior announced that the agency would begin a comprehensive review to "identify and evaluate potential reforms" to the federal coal program. This broad review will be conducted as a "Programmatic Environmental Impact Statement" and will analyze a variety of issues, including "how, when, and where to lease; how to account for the environmental and public health impacts of federal coal production; and how to ensure American taxpayers are earning a fair return for the use of their public resources."[91]

BLM should mirror this important step taken by the Department of Interior and conduct a similar comprehensive review of the federal onshore oil and gas leasing program. One of the most crucial issues BLM should analyze—ideally as part of a comprehensive programmatic review or future rulemaking—is the socially optimal amount for royalty rates that the agency should set on new competitive leases going forward. Because BLM has indicated in its proposed rulemaking that royalty rates will not be raised until the agency has provided an opportunity for public participation, the agency should consider issuing a moratorium on federal oil and gas leases while conducting the comprehensive review, as the Secretary has done for federal coal leases. A temporary pause in issuing new leases

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[88] *See* JAYNI FOLEY HEIN & PETER HOWARD, INSTITUTE FOR POLICY INTEGRITY AT NYU SCHOOL OF LAW, ILLUMINATING THE HIDDEN COSTS OF COAL: HOW THE INTERIOR DEPARTMENT CAN USE ECONOMIC TOOLS TO MODERNIZE THE FEDERAL COAL PROGRAM (2015); JAYNI FOLEY HEIN, INSTITUTE FOR POLICY INTEGRITY AT NYU SCHOOL OF LAW, CAPTURING VALUE: SCIENCE AND STRATEGIES TO CURB METHANE EMISSIONS FROM THE OIL AND NATURAL GAS SECTOR 2 n.4 (2014) ("The social cost of methane, like the social cost of carbon, is a metric that estimates the monetary value of impacts associated with marginal changes in methane emissions in a given year. It includes a range of anticipated climate impacts, such as net changes in agricultural productivity and human health, property damage from increased flood risk, and changes in energy system costs, such as reduced costs for heating and increased costs for air conditioning. It is typically used to assess the avoided damages as a result of regulatory actions (i.e., benefits of rulemakings that have an incremental impact on cumulative global greenhouse emissions).").

[89] *See, e.g.*, *Glossary of Statistical Terms*, OECD, https://stats.oecd.org/glossary/detail.asp?ID=824 (last updated March 4, 2003). Negative externalities, such as pollution, result in private production costs being lower than the social costs of production because the producer does not internalize the costs pollution imposes on society at large (i.e., negative health and environmental consequences resulting from pollution).

[90] Press Release, Dep't of Interior, Secretary Jewell Launches Comprehensive Review of Federal Coal Program (Jan. 15, 2016), http://www.blm.gov/wo/st/en/info/newsroom/ 2016/january/nr_01_15_ 2016.html.

[91] *Id.*

would ensure that BLM does not continue to issue leases with a royalty rate that is below the socially optimal level and which does not receive a fair share of return for taxpayers.

In implementing a temporary moratorium on new federal coal leases during the programmatic review, Secretary Jewell noted that the MLA provides the Secretary of the Interior with substantial discretionary authority. Specifically, Secretary Jewell invoked her discretionary authority under 30 U.S.C. § 201, which governs federal coal leases and provides that the Secretary "shall, in [her] discretion, upon the request of any qualified applicant or on his own motion, from time to time, offer such lands for leasing and shall award leases thereon by competitive bidding."[92] Similarly, Section 226(a), which governs federal onshore oil and gas leases, provides the Secretary with discretion and states that "[a]ll lands subject to disposition under this chapter which are known or believed to contain oil or gas deposits *may* be leased by the Secretary."[93] The term "may" rather than "shall" or "must" suggests that leasing oil and gas lands is a discretionary action that is permitted, but not required to be conducted on a particular timeline.

### *BLM Should Ensure that It Receives Fair Market Value from Royalties on Oil and Gas Leases*

BLM is required to receive "fair market value" on federal oil and gas leases. BLM's statutory duty to earn a "fair market value" for the rights that it conveys to private parties is found in the Federal Land Policy and Management Act (FLPMA). The FLPMA requires that the United States "receive fair market value of the use of the public lands and their resources unless otherwise provided for by statute."[94] Although the statute does not define what constitutes "fair market value," the Department of Interior has provided guidance on the scope of fair market value. In 1982, the Department of Interior established a working group to review its fair market value procedures.[95] The task force determined that fair market value was not merely the value of the resource discovered or produced, but the value of the right to explore and, if there is a discovery, to develop and produce the energy resource.[96] Thus, the FLPMA "describes the value of using the lands, and not solely the value of the resources."[97]

The MLA, which also governs federal oil and gas lease terms, does not contain an explicit "fair market value" requirement. Rather, the MLA states that the Secretary of the Interior can include coal, oil, or gas lease terms that she or he deems necessary "to insure the sale of the production of such leased lands to the United States and to the public at reasonable prices, for the protection of the interests of the United States, for the prevention of

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[92] 30 U.S.C. § 201 (2012); U.S. DEP'T OF INTERIOR, ORDER NO. 3338, DISCRETIONARY PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT TO MODERNIZE THE FEDERAL COAL PROGRAM 9 (Jan. 15, 2016), http://www.blm.gov/style/medialib/blm/wo/Communications_Directorate/public_affairs/news_release_attachments.Par.4909.File.dat/SO%203338%20Coal.pdf.

[93] 30 U.S.C. § 226(a).

[94] 43 U.S.C. § 1701(a)(9).

[95] HEIN & HOWARD, *supra* note 88, at 5 (2015) (citing U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-14-50, OIL AND GAS RESOURCES: ACTIONS NEEDED FOR INTERIOR TO BETTER ENSURE A FAIR RETURN 3 (2013), http://www.gao.gov/assets/660/659515.pdf).

[96] *Id.*

[97] *Id.*

monopoly, and for the safeguarding of the public welfare."[98] This language is even more subjective than that in the FLPMA, and BLM should interpret the phrases "interests of the United States" and "public welfare" to require optimizing social welfare when setting the royalty rates on oil and gas leases.

Further, fair market value is defined in BLM's economic valuation handbook as "the amount in cash, or on terms reasonably equivalent to cash, for which, in all probability, the property would be sold by a knowledgeable owner willing but not obligated to sell to a knowledgeable purchaser who desired but is not obligated to buy."[99] Thus, "fair market value" is a relatively "subjective assessment" that BLM should interpret "within the broader context and goals of the Federal Land Policy and Management Act and Mineral Leasing Act."[100]

BLM should use its discretion as the agency charged with implementing crucial portions of both the FLPMA and the MLA and interpret "fair market value" broadly to require maximizing the social return on oil and gas production.

### *BLM Should Revise the Royalty Rate for Onshore Oil and Gas Leases to Account for the Environmental and Social Costs of Oil and Gas Production*

BLM should increase its royalty rates for federal oil and gas leases in the future to account for the environmental externalities associated with oil and gas production. These externalities currently impose uncompensated costs on the public. These costs include "local air pollution from exploration, development, and transportation to and from the well site; fugitive methane emissions, which contribute to climate change; habitat disruption; noise pollution; infrastructure wear and tear; and water contamination, among others. Failing to account for these costs in the terms of federal leases shifts them onto taxpayers, who already receive an improvidently low return for the right to exploit federal mineral resources."[101] Similar to the context of coal production, "environmental externalities vary with the amount" of oil and gas being produced; thus, "these costs are best recouped through the royalty rate."[102]

Because BLM has a statutory duty to responsibly and efficiently manage public lands for present and future generations, the agency should be compensated for the costs to taxpayers of oil and gas production on public lands due to externalities—including climate change impacts, local air pollution, threats to water quality and supply, habitat disruption, noise pollution, and more.[103] BLM must consider the costs that these externalities impose

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[98] 30 U.S.C. §§ 181–287 (2015)).

[99] U.S. BUREAU OF LAND MGMT., H-3070-2, ECONOMIC EVALUATION OF OIL AND GAS PROPERTIES HANDBOOK, at I.C, http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.39460.File.dat/h3070-2.pdf.

[100] HEIN, *supra* note 63, at 7 (discussing federal statutory requirements on fair market value regarding oil, gas, and coal leases).

[101] *Id.* at 2.

[102] HEIN & HOWARD, *supra* note 88, at 12.

[103] *See id.* at 5 (describing these externalities in the context of coal production).

"on local communities close to [oil and gas wells]; on current and future visitors to public lands seeking recreation, wildlife, or scenic beauty; and on current and future taxpayers who will bear the cost of mitigating and adapting to climate change pollution for decades to come."[104] It is especially important for BLM to account for these externalities in its regulations because where an "externality is not otherwise addressed by federal law, failure to account for the cost of this externality amounts to a subsidy for [oil and gas] companies."[105] BLM's lack of analysis in the proposed rulemaking suggests that many of the externalities resulting from oil and gas production remain unaddressed.

***BLM Should Account for the Social Cost of Methane in Setting Future Royalty Rates***

One important set of externalities that BLM should account for in setting future royalty rates are those associated with methane emissions. A reliable metric that quantifies the externality costs imposed by methane emissions is the social cost of methane.[106] Externalities resulting from methane emissions include climate change-related costs resulting from increased greenhouse gases, increased ozone, and impaired air quality.[107] Raising royalty rates on federal oil and gas leases will allow BLM to better account for the environmental and social costs of oil and gas production, including the costs imposed by methane emissions, which can be quantified using the social cost of methane. If leaseholders do not pay royalty rates that reflect the social cost of methane and other externalities, the environmental and social costs resulting from methane emissions are unfairly shouldered by the public. Moreover, if royalty rates do not reflect the social cost of methane, leaseholders may continue to emit methane at inefficient levels and forego opportunities for valuable gas capture.

The federal government already uses widely accepted economic tools, including EPA's social cost of carbon and social cost of methane, to quantify the environmental and social costs associated with certain environmental impacts, such as greenhouse gas emissions. EPA's social cost of methane builds on the framework under which the social cost of carbon was developed and is based on the latest peer-reviewed science.[108] The social cost of methane results in a conservative estimate of the environmental impacts of methane releases because it "omits certain damages" that are difficult to quantify and therefore

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[104] *Id.*

[105] *Id.*

[106] *See* HEIN, *supra* note 88, at 2 (explaining why federal regulation is necessary to ensure that the social cost of methane is accounted for as an externality of fugitive methane emissions); *see also* HEIN & HOWARD, *supra* note 88, at 5 ("Using economic tools like the Social Cost of Methane, we can estimate the cost of these methane emissions to society.").

[107] *See* HEIN, *supra* note 88, at 2 ("Methane currently accounts for about 9 percent of total U.S. greenhouse gas emissions. Methane also contributes directly to the formation of ozone—another source of global warming and impaired air quality.").

[108] *See* Alex L. Marten, *Incremental $CH_4$ and $N_2O$ Mitigation Benefits Consistent with the U.S. Government's SC-$CO_2$ Estimates*, 15 CLIMATE POLICY 678 (2015). "Marten et al. takes a reasonable (and conservative) approach to estimating the Social Cost of Methane and currently constitutes the best available science to inform agency regulation. Specifically, Marten et al. builds on the methodology used to develop the Social Cost of Carbon. The study maintains the same three integrated assessment models, five socioeconomic-emissions scenarios, equilibrium climate sensitivity distribution, three constant discount rates, and aggregation approach that were agreed upon by the Interagency Working Group." HEIN & HOWARD, *supra* note 88, at 20 n.34.

"represents a lower-bound estimate of the cost of methane emissions."[109] BLM has properly recognized that the social cost of methane is appropriate to use for evaluating the effects of methane release. It should also use the social cost of methane in setting royalty rates. Other agencies have already begun using the social cost of methane in their analyses of externality costs. EPA, for example, has already begun using the social cost of methane in many of its rulemakings.[110] BLM should use these economic tools when evaluating the fair market value of oil and gas production on federal lands and setting royalty rates on new competitive leases.

## IV. BLM Should Determine the Socially Optimal Percentage for the Proposed "Adder Provision" and Offer a Transparent Justification of Its Analysis

In its proposed rulemaking, BLM suggests an adder provision that would be imposed on leaseholders who violate the applicable flaring limits during a given 12-month period. This provision is expressed as a penalty rate representing a 4% increase over the current royalty rate on new competitive leases (at the time the penalty is imposed). As part of the comprehensive programmatic review suggested above, BLM should determine the percentage increase in the royalty rate for the proposed "adder provision" that maximizes social welfare. Rather than delaying implementation of the proposed adder provision, however, BLM should implement a reasonable and transparently justified adder provision in the final rule, then adjust this provision as necessary after conducting a programmatic review. Requiring leaseholders who violate threshold flaring limits to pay an increased royalty rate on *all* oil and gas production for the subsequent 12-month period will likely create a significant incentive for leaseholders to maintain flaring below the limit. But rather than arbitrarily selecting 4% as the increased royalty rate, BLM should conduct a comprehensive review to determine the socially optimal rate for the adder provision. In calculating the optimal rate for the adder provision, BLM should account for the externalities that result when leaseholders violate the flaring limits. Because methane flaring produces carbon dioxide emissions, one metric BLM should use is the social cost of carbon. Regardless of what percentage BLM ultimately chooses, the agency should offer a transparent justification of its analysis and calculations in reaching that percentage.

BLM's current proposal suggests an adder provision that would result in a 4% increase in the royalty rate over the current base rate on new competitive leases.[111] The royalty rate increase would be based on the lease holder's record of routine flaring of associated gas from the lease during the previous year. BLM would implement a "look back" system to evaluate leaseholders' records of routine flaring over the prior 12 months and, if a leaseholder flared above a certain threshold for 6 months or more of that 12-month period, its royalty rate for the next year would increase by some increment (the rule suggests 4% as a possibility). Thus, any leaseholder that reported above-threshold flaring for at least 6

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[109] HEIN & HOWARD, *supra* note 88, at 7.

[110] *See id.* at 6 (citing 80 Fed. Reg. 52,099, 52,145 (Aug. 27, 2015) (Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills); 80 Fed. Reg. 56,593 (Sept. 18, 2015) (Oil and Natural Gas Sector: Emission Standards for New and Modified Sources)).

[111] Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. 6616, 6660 (proposed Feb. 8, 2016) (to be codified at 43 C.F.R. pts. 3100, 3160, 3170).

months of the year would be obligated to pay a 16.5% royalty rate on *all* oil and gas production removed or sold from the lease during the subsequent calendar year.[112] If the leaseholder remained at or below the flaring threshold for the next 12-month period, the rate would then revert back to 12.5% for the following calendar year.

BLM should revise its adder provision after conducting a thorough analysis to determine the socially optimal rate to impose on leaseholders who violate the flaring limits. And, at a minimum, BLM should justify whatever penalty rate it chooses to implement under the adder provision in the final rule.

***BLM Should Offer a Transparent Justification of Its Analysis for the Chosen Percentage***

Regardless of the penalty rate percentage BLM ultimately chooses, it should transparently justify the process it used to reach that amount. As part of the comprehensive programmatic review suggested above, BLM should engage in a thorough analysis to determine the appropriate penalty rate. In the proposed rulemaking, BLM suggests a 4% increase over the base royalty rate that would be implemented as the penalty rate. The proposal, however, does not provide any explanation or justification to show how or why BLM chose 4% as the proposed rate in the adder provision.

BLM notes in the proposed rule that the purpose of the adder provision is "(1) To create an incentive for bidders to consider the availability of gas capture infrastructure and the proximity of gas processing facilities as attributes that add significant value to Federal oil development leases; and (2) To create an incentive for federal lease holders to plan for gas capture prior to or in conjunction with the development of oil wells."[113] Although these incentives are legitimate agency purposes, BLM should nonetheless justify the means by which it is proposing to achieve those purposes. Without an explanation from BLM as to how it calculated the royalty rate increase of 4%, it is impossible to determine whether the agency conducted an appropriate analysis.

In sum, regardless of whether BLM ultimately changes the percentage increase in the royalty rate for the adder provision in the final rule, the agency ought to transparently justify its analysis and calculations. If BLM did not conduct a thorough cost-benefit analysis—comparing the various costs and benefits under different percentages—before suggesting 4% in the proposed rule, it should do so to determine the socially optimal royalty rate percentage for the adder provision in the final rule.

***The Penalty Rate Percentage Should Incorporate the Social Cost of Carbon***

In determining the socially optimal penalty rate percentage, BLM should account for the social cost of carbon. The social cost of carbon is an estimate of the economic cost of climate impacts caused by one additional metric ton of carbon dioxide emissions.[114]

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[112] *Id.*

[113] *Id.*

[114] *See* INTERAGENCY WORKING GROUP ON SOCIAL COST OF CARBON, U.S. GOV'T, TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12,866, at 2 (2010).

Because the social cost of carbon increases over time, the penalty rate BLM chooses should also reflect this gradual increase. The social cost of carbon is a reliable, peer reviewed economic tool that other agencies have used as a way to internalize the externalities created by carbon emissions.[115] Here, it is appropriate for BLM to account for the social cost of carbon when setting the penalty rate at the socially optimal percentage because methane flaring produces carbon dioxide. The social cost of carbon is one appropriate indicator of the rate at which the royalty penalty should be set because the social cost of carbon measures the costs associated with carbon emissions from oil and gas production—here, carbon emissions resulting from flaring—that are currently unaccounted for. Using the social cost of carbon as a metric to guide the proposed penalty royalty rate amount will allow BLM both to create proper incentives for increased gas capturing capabilities and force leaseholders to internalize the environmental and social costs imposed on everyone in society when leaseholders violate the flaring limits.

***The Penalty Rate Percentage Should Account for Monitoring Costs***

BLM should undertake a comprehensive analysis to determine if it has the capacity to monitor compliance with the flaring limits and self-reporting requirements. This analysis could be conducted as one component in the larger comprehensive programmatic review discussed above. In order to effectively implement the proposed adder provision, BLM should account for the projected effectiveness of monitoring in setting the penalty rate. The probability that these monitoring and self-reporting methods will be effective in achieving compliance should be factored into BLM's analysis in determining the penalty rate percentage. Because the incentive structure that BLM will be relying on depends on the accuracy of self-reporting and the detection of violations, BLM might consider implementing a higher penalty rate to adequately incentivize compliance with the flaring limits.

The chosen penalty rate should reflect relevant studies on calculating the optimal penalty in the context of environmental regulation.[116] To determine the optimal penalty, BLM should use a classic penalty formula, under which the expected penalty must be greater than the expected economic gain to the leaseholder from violating the regulation to effectively achieve deterrence. Here, the leaseholder's expected economic gain would likely result from any costs the leaseholder did not incur to comply with the flaring limit. The optimal penalty formula may also be described in the following way:

a. Expected penalty > economic gain, assuming

[115] For an in-depth explanation of the methodology used to calculate the social cost of carbon, see Institute for Policy Integrity et al., Joint Comments on Proposed Exception to the Colorado Roadless Rule and Supplemental Draft Environmental Impact Statement, at 7 (Nov. 2015), http://policyintegrity.org/documents/Forest_Service_SDEIS_comments.pdf.

[116] *See, e.g.*, STEVEN C. HACKETT, ENVIRONMENTAL AND NATURAL RESOURCES ECONOMICS: THEORY, POLICY, AND THE SUSTAINABLE SOCIETY 201 (2014) (describing the formula to determine the optimal penalty in environmental laws).

b. Expected Penalty = [Probability of detection] x [probability of being sanctioned given detection] x $ sanction.[117]

Using classic deterrence theory, BLM should calculate the appropriate penalty based on the likelihood that its monitoring and self-reporting requirements will be effective (i.e., probability of detection). This technique will allow BLM to ensure its adder provision properly incentivizes compliance with the flaring limits.

Currently, the proposed rule requires leaseholders to follow a set of self-reporting requirements to regularly inform BLM of the amounts of gas being flared. Without a proper framework for monitoring flaring, however, BLM will be unable to uniformly and fairly enforce the proposed adder provision. As with any regulatory system that relies on self-reporting, BLM must ensure that it has the necessary resources to monitor compliance with the self-reporting requirements and to ensure that the reporting is accurate. Otherwise, any adder provision relying on self-reporting of the flaring limits may be ineffective.

**Conclusion**

The proposed rule takes a significant step forward in reducing the waste of natural gas and ensuring that the public benefits from the extraction of natural resources from federal and tribal lands. Before BLM finalizes the rule, however, it should fine-tune its regulatory impact analysis and reassess some of its policy choices. In particular, BLM should: (1) conduct a thorough cost-benefit analysis to maximize net benefits, (2) provide alternative flaring limits and exemptions only when socially net beneficial and in line with the "multiple use" principle, even if the result is sometimes to forego extraction of resources, (3) increase royalty rates on federal oil and gas leases to account for the environmental and social costs of oil and gas production, and (4) determine the socially optimal percentage for the proposed "adder" provision.

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[117] *Id.*