COLUMBIA LAW SCHOOL
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U.S. Environmental Protection Agency
EPA Docket Center
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Re: EPA's Proposed Revisions to the New Source Performance Standards for the Oil and Natural Gas Source Category (Docket ID EPA-HQ-OAR-2017-0483)

To Whom It May Concern:

The Sabin Center for Climate Change Law submits these comments in response to the Environmental Protection Agency ("EPA")'s proposed revisions[1] to the final rule titled "Oil and Natural Gas Sector: Emissions Standards for New, Reconstructed, and Modified Sources" published on June 3, 2016 ("2016 Rule").[2] The comments focus on EPA's proposal to weaken the fugitive emissions standards in the 2016 Rule. For the reasons discussed below, the Sabin Center strongly opposes weakening the standards, and takes issue with EPA's stated rationale for doing so. While EPA asserts that the standards are not cost effective, it has failed to adequately justify that assertion, which directly contradicts its own previous findings. Moreover, in assessing the proposal to weaken the standards, EPA has substantially underestimated the climate and other impacts thereof.

I. EPA Has Failed to Adequately Justify its Proposed Revisions to the 2016 Rule

In the 2016 Rule, EPA established fugitive emission standards, requiring oil and natural gas producers to monitor and repair leaks at well sites and compressor stations.[3] EPA is now proposing to revise those standards, arguing that they impose excessive costs on producers.[4] That argument is wholly without merit and lacks a reasoned basis.

[1] Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration, 83 Fed. Reg. 52056 (Oct. 15, 2018) [hereinafter "Proposed Amendment"].
[2] Oil and Natural Gas Sector: Emissions standards for New, Reconstructed, and Modified Sources, 81 Fed. Reg. 35,824 (Jun. 3, 2016) [hereinafter "2016 Rule"].
[3] 2016 Rule, *supra* note 2, at 35,855–35,865.
[4] Proposed Amendment, *supra* note 1, at 52,062.

It is well established that agency rulemaking must be based on a consideration of relevant evidence and accompanied by a clear statement of how that evidence supports the action taken. As the Supreme Court explained in *Motor Vehicle Manufacturers Association v. State Farm Mutual Automobile Insurance Company*, the agency must "articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made."[5] Where, as here, the agency is reversing a previously held position, its explanation for doing so must be particularly strong. This is because, according to the Supreme Court, "a settled course of behavior embodies the agency's informed judgment that, by pursuing that course, it will carry out the policies committed to it by Congress. There is, then, at least a presumption that those policies will be carried out best if the settled rule is adhered to."[6] As a result, "an agency changing its course . . . is obligated to supply a reasoned analysis for the change beyond that which may be required when an agency . . . acts in the first instance."[7]

As noted above, at the time it adopted the 2016 Rule, EPA concluded that the fugitive emissions standards "are cost effective for reducing . . . emissions" based on a detailed model plant analysis.[8] EPA now seeks to rely on an alternative version of the analysis to argue that it "overestimated . . . the cost effectiveness of the standards" and justify changes thereto.[9] In particular, EPA is proposing to change the frequency with which oil and natural gas producers must conduct leak monitoring at well sites and compressor stations, but those changes are not supported by its alternative analysis.

With respect to non-low production well sites, EPA's alternative model plant analysis does *not* justify changing the existing semiannual monitoring requirement, set out in the 2016 Rule. In fact, the alternative analysis supports retention of that requirement, again finding that "semiannual monitoring . . . appear[s] to be cost-effective."[10] While recognizing this, EPA asserts that the requirements "may not be as cost-effective as presented" in the alternative analysis, "due to gaps in the available data and factors that may bias the analysis towards overestimation of [emissions] reductions."[11] Again, however, that conclusory assertion is not supported by the available evidence.

Contrary to EPA's claims, the alternative model plant analysis likely *underestimates* the emissions reductions associated with semiannual monitoring of non-low production well sites. The reductions were calculated as a percentage of the model plant's baseline emissions which were, in turn, calculated based on the number of fugitive emission components at the model plant and average emissions therefrom (as reflected in emissions factors).[12] Thus, as EPA has itself

[5] Motor Vehicle Mfrs. Ass'n. v. State Farm Mut. Auto Ins. Co., 463 U.S. 29, 43 (1983).
[6] *Id*. at 41-42 (quoting Atchison, T. & S.F.R. Co. v. Wichita Bd. of Trade, 412 U.S. 800, 807-808 (1973)).
[7] *Id*. at 42.
[8] 2016 Rule, *supra* note 2, at 35,855-38,856.
[9] Proposed Amendment, *supra* note 1, at 52,062.
[10] *Id*.
[11] *Id*.
[12] EPA, Background Technical Support Document for the Proposed Reconsideration of the New Source

recognized, any inaccuracies in the component counts and/or emissions factors will "bias" the calculation.[13] Several factors suggest that the calculation has been biased low:

- To calculate the model plant's baseline emissions, EPA used component counts from the Greenhouse Gas Inventory.[14] Past research has found those counts to be "contradictory" and "incomplete."[15] EPA's own analysis shows that, for at least some components (e.g., separators), the counts are much too low.[16]

- For most fugitive emission components, EPA used emissions factors from the *Protocol for Equipment Leak Emissions Estimates*, issued in November 1995.[17] In the subsequent twenty-three years, oil and natural gas production processes have changed significantly, with increased reliance on advanced production techniques (e.g., hydraulic fracturing) that can increase emissions.[18] This, combined with problems in the original calculation of the emissions factors, results in substantial underestimation of emissions.[19] Thus, for example, a 2015 study found emissions from oil and natural gas production in the Barnett Shale to be ninety percent higher than estimates based on emissions factors.[20]

- For a subset of emission components (i.e., pressure relief devices on controlled storage vessels), EPA used emissions factors derived from a 2016 study, involving an aerial survey of seven oil and natural gas basins.[21] According to the study's authors, due to the limited sensitivity of equipment used during the survey, only "high-emitting hydrocarbon sources" were identified.[22] Thus, as EPA has itself acknowledged, the emissions factors derived from the study "are likely underestimated . . . because small or medium sized emissions would not

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Performance Standards: 40 CFR Part 50, subpart OOOOa 17-18 & 35 (2018), https://www.regulations.gov/document?D=EPA-HQ-OAR-2017-0483-0040.

[13] Memorandum to EPA Docket No. EPA-HQ-OAR-2017-0483, EPA Analysis of Well Site Fugitive Emissions Monitoring Data Provided by API (2018), https://www.regulations.gov/document?D=EPA-HQ-OAR-2017-0483-0036 [hereinafter "EPA Memorandum"].

[14] Proposed Amendment, *supra* note 1, at 52,062.

[15] A.R. Brandt et al., *Methane Leaks from North American Natural Gas Systems*, 343 SCI. 733, 734 (2014). We note that EPA recently updated the component counts used for the Greenhouse Gas Inventory. While the updates are thought to have improved count accuracy, it appears that, at least in some instances, the counts continue to be significantly underestimated. *See e.g.*, Proposed Amendment, *supra* note 1, at 52,062.

[16] For example, whereas EPA's alternative model plant analysis assumed just one separator per oil well, data obtained by the agency indicates that, on average, there are three separators per well site. *See* Proposed Amendment, *supra* note 1, at 52,062.

[17] Proposed Amendment, *supra* note 1, at 52,063. *See also* EPA, Protocol for Equipment Leak Emissions Estimates (1995), https://perma.cc/6Q57-K7B5.

[18] Brandt et al., *supra* note 15, at 734.

[19] *Id.*

[20] Daniel Zavala-Araiza et al., *Reconciling Divergent Estimates of Oil and Gas Methane Emissions*, 51 PROC. NAT'L ACAD. SCI. 15597, 15597 (2015).

[21] Proposed Amendment, *supra* note 1, at 52,063.

[22] David R. Lyon et al., *Aerial Surveys of Elevated Hydrocarbon Emissions from Oil and Gas Production Sites*, 50 ENVTL. SCI. & TECH. 4877, 4877 (2016) (indicating that the study "assess[ed] the prevalence and distribution of high emitting hydrocarbon sources"). *See also id*. at 4878-4879 (discussing the sensitivity of the equipment used to detect emissions).

be visible" during the survey.[23]

The same flaws also affect EPA's analysis of the monitoring requirements for compressor stations in the 2016 Rule. In both cases, EPA's analysis likely underestimates the emissions reductions resulting from, and thus the cost effectiveness of, the 2016 Rule requirements. Even without correcting for this underestimation, the analysis finds the requirements to be cost effective, and thus does not justify EPA's proposed revisions.

EPA has also failed to justify its proposal to adopt new – less stringent – monitoring requirements for low-production well sites. EPA bases its analysis of the new requirements on a 2011 study, reporting emissions data from just twenty-seven low production wells, all located in Texas' Barnett Shale.[24] Reliance on such geographically limited data is inappropriate since, as EPA has itself noted, "different basins have different leak rates."[25] Moreover, recent research suggests that the 2011 study underestimates leak rates, both in the Barnett Shale and other areas. In this regard, we note that research has found emissions from low-production wells to be highly skewed, with a small number of "super-emitters" accounting for a large proportion of emissions.[26] These super-emitters tend to be underrepresented in small sample sizes, such as that used for the 2011 study, causing total emissions to be underestimated.[27]

Given the above, the analysis relied on by EPA is fatally flawed, and does not support its conclusions regarding the cost-effectiveness of the monitoring requirements in the 2016 Rule. A decision to revise those requirements based on the analysis would, therefore, be arbitrary and capricious and violate the Administrative Procedure Act.

II. EPA Has Underestimated the Climate and Other Impacts of Revising the 2016 Rule

EPA asserts that its proposed revisions to the 2016 Rule will result in only minimal foregone benefits. EPA bases that assertion on an alternative Regulatory Impact Analysis ("RIA") in which it has recalculated the climate and other benefits of the 2016 Rule. The alternative RIA is, like EPA's alternative model plant analysis, irredeemably flawed.

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[23] Proposed Amendment, *supra* note 1, at 52,063.
[24] *Id*. at 52,068.
[25] EPA Memorandum, *supra* note 15, at 3. The differences can be significant. A 2014 study, for example, found that average emission rates in the Pinedale basin in Wyoming are seventy-nine percent higher than those in the Barnett Shale. *See* Halley L. Brantley et al., *Assessment of Methane Emissions from Oil and Gas Production Pads using Mobile Measurements*, 48 ENVTL. SCI. & TECH. 14508, 14508 (2014) (finding emission rates of 0.33 grams per second in the Barnett Shale in Texas, compared to 0.59 grams per second in the Pinedale Basin in Wyoming).
[26] Daniel Zavala-Araiza et al., *Toward a Functional Definition of Methane Super-Emitters: Application to Natural Gas Production Sites*, 49 ENVTL. SCI. & TECH. 8167, 8168 (2015) (finding that "lower production sites (10-100 thousand standard cubic feet per day or Mcf/d) are almost twice as likely to be among the top 5% of emitters relative to sites with an order of magnitude higher rates of production (100-1000 Mcf/d)").
[27] Brandt et al., *supra* note 15, at 734 (finding that, "if emissions distributions have "heavy tails" (e.g., more high-emissions sources than would be expected in a normal distribution), small sample sizes are likely to underrepresent high-consequence emissions sources").

A. EPA Has Inappropriately Limited its Analysis to Domestic Climate Impacts

In the alternative RIA EPA has revised its approach to calculating the climate benefits associated with reducing methane emissions in accordance with the 2016 Rule.[28] Whereas climate benefits were previously calculated based on the global social cost of methane ("SC-CH4"), EPA now proposes to use a domestic-only SC-CH4, which reflects "an approximation of the climate change impacts that occur within U.S. borders."[29] This is inappropriate.

By focusing solely on climate change impacts within the U.S., EPA's domestic SC-CH4 underestimates the cost of emissions. This is because, as EPA has itself recognized, "[t]he impacts of climate change outside the United States . . . will also have relevant consequences on the United States and our citizens."[30] According to EPA, the U.S. will likely be forced to increase humanitarian aid, deal with mass migrations, and manage changing security needs (e.g., in the Arctic) as a result of overseas climate change impacts.[31] Overseas impacts could also affect the U.S. economy, disrupting international trade and undermining financial markets.[32]

Given these spill-over effects, failing to account for overseas climate change impacts will lead to poor regulatory decisions, which fail to adequately protect public health and welfare.[33] Accordingly, many countries have based their climate policies on the global costs and benefits of reducing greenhouse gas emissions (e.g., the global social cost of carbon ("SCC")).[34] Examples include Germany, which uses a global SCC of US$167 per ton in 2030 and the U.K., which uses US$115 per ton in 2030.[35] The U.K. also applies a global SC-CH4, equal to approximately US$400 in 2010, rising to US$1200 by 2040.[36]

Contrary to EPA's assertion, switching from a global to domestic-only SC-CH4 is not required to comply with OMB Circular A-4, which states that regulatory analyses "should focus on the benefits and costs that accrue to [U.S.] citizens and residents."[37] Given that overseas climate change impacts will inevitably affect the U.S., accurately assessing costs and benefits to U.S.

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[28] EPA, Regulatory Impact Analysis for the Proposed Reconsideration of the Oil and Natural Gas Sector Emission Standards for New, Reconstructed, and Modified Sources 3-6 – 3-13 (2018), https://www.regulations.gov/document?D=EPA-HQ-OAR-2017-0483-0082.
[29] *Id*. at 3-7.
[30] 2016 Rule, *supra* note 2, at 35,836.
[31] *Id*.
[32] For a discussion of these effects, *see* Dr. Peter H. Howard & Jason A. Schwartz, *Think Global: International Reciprocity as Justification for a Global Social Cost of Carbon*, 42 COLUM. J. ENVTL. L. 203 (2017).
[33] *Id*. at 222 ("If all countries…set their greenhouse gas emissions levels based on only their domestic costs and benefits, ignoring the large global externalities, the collective result would be substantially sub-optimal climate protections").
[34] *Id*. at 223.
[35] *Id*. at 285 – 286.
[36] U.K. Department for Environment, Food and Rural Affairs, The Social Cost of Carbon (SCC) Review – Methodological Approaches for Using SCC Estimates in Policy Assessment 58 (2005) (specifying an average SC-CH_4 of £317 in 2010 and £920 in 2040).
[37] OMB, Circular A-4 to the Heads of Executive Agencies and Establishments re: Regulatory Analysis 15 (2003), https://perma.cc/9EFE-KTQB.

citizens and residents requires a global focus. Thus, a working group of twelve federal government agencies (including OMB) has repeatedly determined that global climate impacts should be considered, notwithstanding the references to domestic effects in Circular A-4.[38] Consistent with this determination, EPA has long used global values in its regulatory analyses.[39]

B. EPA Has Failed to Adequately Assess Economic Impacts

In its original RIA for the 2016 Rule, EPA estimated that implementing the fugitive emissions standards would result in the creation of 660 annual full time equivalent jobs by 2020, and 1,400 annual full time equivalent jobs by 2025.[40] While recognizing that some of those jobs will be lost if the standards are revised, EPA asserts that the losses will be "slight," without pointing to any evidence to support that view.[41]

Contrary to EPA's assertion, revising the fugitive emission standards could result in significant job losses, particularly in the leak detection and repair services sector. Prior research suggests that the adoption of regulations targeting fugitive emissions has been a major driver of job growth in the sector.[42] Companies involved in the sector in Colorado, Ohio, and Wyoming – three states that have begun regulating fugitive emissions since 2014 – experienced growth of five to thirty percent to 2017.[43] Further growth was expected following EPA's adoption of the 2016 Rule, but is likely to be limited if the Rule is revised as currently proposed.[44]

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[38] Interagency Working Group on the Social Cost of Carbon, U.S. Government, Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 10-11 (2010), https://perma.cc/L8YG-R42D; Interagency Working Group on the Social Cost of Carbon, U.S. Government, Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 17 (2016), https://perma.cc/H5G5-9SP6.

[39] *See e.g.*, Regulatory Impact Analysis: Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Sewage Sludge Incineration Units (2010), https://perma.cc/S4QR-2NWG; Regulatory Impact Analysis: Petroleum Refineries New Source Performance Standards Ja (2010), https://perma.cc/86QV-Z66G; Regulatory Impact Analysis for the Final Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (2015), https://perma.cc/W2CB-SXHH; Regulatory Impact Analysis for the Clean Power Plan Final Rule (2015), https://perma.cc/4FEC-4WXV.

[40] EPA, Regulatory Impact Analysis of the Final Oil and Natural Gas Sector: Emissions Standards for New, Reconstructed, and Modified Sources 6-34 (2016), https://www.regulations.gov/document?D=EPA-HQ-OAR-2010-0505-7630.

[41] Proposed Amendment, *supra* note 1, at 52,088. *See also* EPA, *supra* note 28, at 4-42.

[42] *See e.g.* Shawn Stokes et al., The Emerging U.S. Methane Mitigation Industry (2014), http://perma.cc/4Q6TS732; Marie Veyrier et al., Find and Fix: Job Creation in the Emerging Methane Leak Detection and Repair Industry (2017), http://perma.cc/7ZKD-Z22B.

[43] *Id*. at 13.

[44] *Id*. at 3.

I. Conclusion

For the reasons explained above, EPA has failed to adequately justify its proposed revisions to the 2016 Rule, relying on faulty analysis that does not support the conclusions reached. EPA has also substantially underestimated the climate and other impacts of revising the 2016 Rule. Given this, the Sabin Center believes EPA's proposal to be arbitrary and capricious, in violation of the Administrative Procedure Act.

The studies referred to in this letter are attached for your reference. Please do not hesitate to contact me if you have any questions about the letter or attachments.

Sincerely,

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Attachments (6):

(1) A.R. Brandt et al., *Methane Leaks from North American Natural Gas Systems*, 343 SCI. 733 (2014).
(2) David R. Lyon et al., *Aerial Surveys of Elevated Hydrocarbon Emissions from Oil and Gas Production Sites*, 50 ENVTL. SCI. & TECH. 4877 (2016).
(3) Shawn Stokes et al., *The Emerging U.S. Methane Mitigation Industry*, Datu Research White Paper (2014).
(4) Marie Veyrier et al., *Find and Fix: Job Creation in the Emerging Methane Leak Detection and Repair Industry*, Datu Research White Paper (2017).
(5) Daniel Zavala-Araiza et al., *Reconciling Divergent Estimates of Oil and Gas Methane Emissions*, 51 PROC. NAT'L ACAD. SCI. 15597 (2015).
(6) Daniel Zavala-Araiza et al., *Toward a Functional Definition of Methane Super-Emitters: Application to Natural Gas Production Sites*, 49 ENVTL. SCI. & TECH. 8167 (2015).