

June 15, 2020

Paul Ray  
Administrator  
Office of Information and Regulatory Affairs  
Office of Management and Budget  
Eisenhower Executive Office Building  
1650 Pennsylvania Avenue NW  
Washington, D.C. 20503

Re: U.S. Environmental Protection Agency Final Rule on Oil and Natural Gas Sector Emission Standards for New, Reconstructed, and Modified Sources: Reconsideration and Review, RINs 2060-AT54 and 2060-AT90.

Dear Administrator Ray:

The California Air Resources Board (CARB) respectfully requests a meeting with you or the appropriate Office of Information and Regulatory Affairs (OIRA) personnel, pursuant to Executive Order 12866, regarding the United States Environmental Protection Agency (U.S. EPA) Final Rule on Oil and Natural Gas Sector Emission Standards for New, Reconstructed, and Modified Sources: Reconsideration and Review, RINs 2060-AT54 and 2060-AT90.

The OIRA website indicates that the Final Rule was received on June 2, 2020.<sup>1</sup> Because this is a matter of vital importance to individuals, the public health, and the environment, and it is essential that public stakeholders have an opportunity to meet with OIRA, we respectfully request a meeting at the earliest possible time. We are available to meet via phone or videoconference as soon as June 22, 2020.

CARB is the expert agency charged with overseeing all air pollution control efforts in California to attain and maintain health-based air quality standards. CARB's mission is to promote and protect public health, welfare, and ecological resources through effective reduction of air pollutants while recognizing and considering effects on the economy. CARB is also a globally-recognized leader in cost-effective oil and natural gas emissions regulations that protect public health. The feasibility and cost-

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<sup>1</sup> See <https://www.reginfo.gov/public/do/eoDetails?rrid=130621>;  
<https://www.reginfo.gov/public/do/eoDetails?rrid=130622>.

effectiveness of California's Oil and Gas Regulation,<sup>2</sup> which is very similar to (and in many cases more stringent than) the NSPS, discredit U.S. EPA's claims that NSPS compliance is infeasible or unduly burdensome. Yet meaningful federal standards remain critical, as they provide important additional enforcement oversight within California; help reduce the lifecycle methane emissions associated with natural gas imported from out-of-state (about 90 percent of the natural gas consumed in California); reduce climate impacts from out-of-state oil and gas operations (experienced most severely by California's most vulnerable populations and communities); offer needed federal oversight of national and international corporations operating in California; and provide valuable emissions inventory data via reporting requirements.

The proposals to weaken and circumscribe the New Source Performance Standards for the oil and natural gas sector were contrary to the evidence at the times of publication, as detailed in CARB's attached comments on the proposals. Studies published since the close of the latter comment period (for RIN 2060-AT90) on November 25, 2019, further underscore the significance of emissions from these sources and the need for effective controls. These include findings of:

- The prevalence of new leaks forming between surveys,<sup>3</sup> large fugitive emissions from natural gas compressors<sup>4,5</sup> and super-emitter wells,<sup>6</sup> and the potential for extremely high emissions from gas wells blowouts,<sup>7</sup> which demonstrate the importance of retaining frequent LDAR surveys, rather than reducing survey frequency as proposed;
- The volume of emissions from underground gas storage facilities,<sup>8</sup> demonstrating the importance of retaining standards for the transmission and storage sector;

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<sup>2</sup> Cal. Code Regs., tit. 17, §§ 95665-77.

<sup>3</sup> Arvind P. Ravikumar et al., *Repeated leak detection and repair surveys reduce methane emissions over scale of years*, 15 ENVTL. RES. LETT. 034029 (2020), <https://doi.org/10.1088/1748-9326/ab6ae1>.

<sup>4</sup> Daniel Zimmerle et al., *Methane Emissions from Gathering Compressor Stations in the U.S.*, ENVTL. SCI. TECH. (2020), <https://doi.org/10.1021/acs.est.0c00516>.

<sup>5</sup> Andrew K. Thorpe et al., *Methane emissions from underground gas storage in California*, 15 ENVTL. RES. LETT. 045005 (2020), <https://doi.org/10.1088/1748-9326/ab751d>.

<sup>6</sup> Anthony R. Ingraffea et al., *Reported Methane Emissions from Active Oil and Gas Wells in Pennsylvania 2014-2018*, ENVTL. SCI. TECH. (2020), <https://pubs.acs.org/doi/full/10.1021/acs.est.0c00863>.

<sup>7</sup> Sudhanshu Pandey et al., *Satellite observations reveal extreme methane leakage from a natural gas well blowout*, PROC. NAT'L ACAD. SCI. 116 (52) 26376-26381 (2019), DOI: 10.1073/pnas.1908712116, <https://www.pnas.org/content/116/52/26376.short>.

<sup>8</sup> Andrew K. Thorpe et al., *Methane emissions from underground gas storage in California*, 15 ENVTL. RES. LETT. 045005 (2020), <https://doi.org/10.1088/1748-9326/ab751d>.

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- Significant health impacts from compressor station VOC emissions,<sup>9</sup> demonstrating the importance of retaining standards for the transmission and storage sector; and
- Satellite observations and atmospheric inverse modeling demonstrating that emissions estimates from bottom-up inventories may be underestimated by half,<sup>10</sup> suggesting far greater impacts from finalizing the proposals than U.S. EPA estimated.

We also remain deeply concerned that the proposal to repeal the NSPS for methane is designed to evade U.S. EPA's duty to regulate existing sources in the oil and gas sector.<sup>11</sup> Such action is illegal, inappropriate, and contrary to U.S. EPA's Clean Air Act obligations to protect public health and welfare.

We look forward to discussing these concerns with you. Jake Rivas on my staff can be reached at (916) 324-1362 or [jake.rivas@arb.ca.gov](mailto:jake.rivas@arb.ca.gov) to schedule a meeting. Thank you for your attention to these important issues.

Sincerely,



Carolyn Lozo

Chief, Oil and Gas and Greenhouse Gas Mitigation Branch  
California Air Resources Board

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<sup>9</sup> Michael Hendryx & Juhua Luo, *Natural gas pipeline compressor stations: VOC emissions and mortality rates*, EXTRACTIVE INDUSTRIES & SOC'Y (2020) (in press, corrected proof), <https://www.sciencedirect.com/science/article/abs/pii/S2214790X20301398>.

<sup>10</sup> Yuzhong Zhang et al., *Quantifying methane emissions from the largest oil-producing basin in the United States from space*, 6 SCI. ADVANCES 17 (2020), DOI: 10.1126/sciadv.aaz5120, <https://advances.sciencemag.org/content/6/17/eaaz5120?ftag=YHF4eb9d17>.

<sup>11</sup> See 42 U.S.C. § 7411(d).

**Comments of the California Air Resources Board**

**Responding to**

**The United States Environmental Protection Agency**

**Request for Comment on Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review**

**Docket No. EPA-HQ-OAR-2017-0757**

The California Air Resources Board (CARB)<sup>1</sup> opposes the United States Environmental Protection Agency (U.S. EPA)'s efforts to rollback air pollution standards for the oil and natural gas industry, which are described in the Notice of Proposed Rulemaking: "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review," 84 Fed. Reg. 50,244, Docket Identification Number EPA-HQ-OAR-2017-0757 (hereafter "Proposed Rule" or "Proposal"). The Proposal, if finalized, would increase air pollution by removing the entire transmission and storage sector from U.S. EPA's regulated source category, resulting in emissions increases. It would also end federal efforts to regulate methane from new and existing oil and natural gas sources, even though the industry emits so much methane that this pollution dwarves the emissions of entire countries. This Proposal is illegal, and unwarranted at this time of growing climate crisis.

CARB administers a successful statewide air pollution regulation for the oil and natural gas industry. But federal regulations are also necessary: The industry is a substantial source of air pollution nationwide and federal regulations provide important additional enforcement oversight within California. California's successful implementation of its regulation simply demonstrates the feasibility of the 2016 federal rule that U.S. EPA now seeks to roll back. U.S. EPA should be spending its resources implementing such rules, rather than rolling back requirements already in force.

California's Attorney General, along with several other jurisdictions' Attorneys General, will also be submitting comments opposing the Proposal. CARB agrees with the substance of those legal comments and focuses here primarily on the many technical problems with U.S. EPA's proposal. CARB previously submitted comments on U.S. EPA's notice of reconsideration and partial stay of the NSPS, proposed stays of NSPS compliance deadlines and related Notices of Data

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<sup>1</sup> CARB is the expert agency charged with overseeing all air pollution control efforts in California to attain and maintain health-based air quality standards. CARB's mission is to promote and protect public health, welfare, and ecological resources through effective reduction of air pollutants while recognizing and considering effects on the economy.

Availability, and proposed "reconsideration amendments,"<sup>2</sup> and incorporates those comments herein.

## Introduction

Three years have passed since U.S. EPA finalized its "Emission Standards for New, Reconstructed, and Modified Sources," 81 Fed. Reg. 35,824, at 40 Code of Federal Regulations (C.F.R.) part 60, subpart OOOOa (hereafter "New Source Performance Standards," or "NSPS"). The current NSPS is achievable, appropriate, and not in need of amendment, as California, other state and local regulators, and industrial actors are actively demonstrating.

The NSPS protects public health and the environment by reducing uncontrolled emissions of air pollutants, including toxic pollutants with carcinogenic and other health impacts; criteria pollutants that contribute to formation of smog and regional haze and endanger respiratory and cardiovascular health; and methane, a greenhouse gas (GHG) with approximately 86 times the heat-trapping power of carbon dioxide on a 20-year timeframe. The necessity of the methane reductions provided by the NSPS is underscored by the recent Fourth National Climate Assessment: Impacts, Risks, and Adaptation in the United States<sup>3</sup> and Intergovernmental Panel on Climate Change Special Report on Global Warming of 1.5 Degrees Celsius.<sup>4</sup>

The benefit provided by the NSPS significantly outweighs its limited and reasonable burden. The NSPS requirements are minimally costly, especially when viewed as a percentage of industry revenues or profits. They are consistent with actions that good industry operators are already taking, as all of the technologies or practices required in the NSPS are readily available and have been for years.

### I. State regulations demonstrate the federal rules are feasible and necessary

The feasibility and cost-effectiveness of California's Oil and Gas Regulation,<sup>5</sup> which is very similar to the NSPS, demonstrate that U.S. EPA and state governments can successfully regulate this sector and these emissions.

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<sup>2</sup> See Docket ID No. EPA-HQ-OAR-2017-0346-0331 (Aug. 9, 2017) (commenting on 82 Fed. Reg. 25,730 (June 5, 2017)); Docket ID No. EPA-HQ-OAR-2010-0505-12246 (Aug. 9, 2017) (commenting on 82 Fed. Reg. 27,641, 27,645 (June 16, 2017)); Docket ID No. EPA-HQ-OAR-2017-0346-0418 (Dec. 8, 2017) (commenting on 82 Fed. Reg. 51,794, 51,788 (Nov. 8, 2017)); Docket ID No. EPA-HQ-OAR-2017-0483-0785 (Dec. 17, 2018) (commenting on 83 Fed. Reg. 52,056 (Oct. 15, 2018)).

<sup>3</sup> U.S. Global Change Research Program, Fourth National Climate Assessment, Vol. II: Impacts, Risks, and Adaptation in the United States: Overview (2018), available at <https://nca2018.globalchange.gov>.

<sup>4</sup> Intergovernmental Panel on Climate Change (IPCC), Special Report on Global Warming of 1.5°C (2018), available at <https://report.ipcc.ch/sr15/index.html>.

<sup>5</sup> 17 Cal. Code Regs. §§ 95665–77.

California's local air districts, like many regulators across the country, have been controlling volatile organic compounds (VOCs) and other pollutants from the industry with these methods for decades, and are now working with CARB to implement statewide methane control rules. Industry is highly familiar with these approaches, has the necessary equipment, and can implement controls cost-effectively. California's oil and natural gas industry has not experienced substantial implementation issues, with over 300 operators in the state, ranging from the very small "mom and pop" variety to large global companies. Methane-specific regulations such as the NSPS build upon this long regulatory and industry experience.

CARB has successfully implemented its Oil and Gas Regulation, which went into effect on October 1, 2017. To date, all covered facilities (over 700) have met their requirements to report facility and equipment information.<sup>6</sup> Over 200 of these facilities were additionally required to submit their quarterly leak detection and repair (LDAR) data, and all have done so.<sup>7</sup> All 12 underground storage facilities in the state have begun implementing their additional daily or continuous wellhead LDAR monitoring and reporting, as well as their ambient air monitoring of methane.<sup>8</sup> The widespread conducting and reporting of quarterly, and in some cases daily or continuous, LDAR surveys in California demonstrate that the LDAR requirements in the NSPS are achievable.

Many of California's requirements are even more stringent than the NSPS. For example, California's Oil and Gas Regulation requires LDAR inspections of all wells, regardless of production,<sup>9</sup> and quarterly inspections of wellhead-only well sites,<sup>10</sup> while the NSPS only requires semiannual inspections of well sites and exempts wellhead-only well sites from monitoring requirements.<sup>11</sup> California's own experience shows such controls are feasible.

Indeed, *national* compliance with current U.S. EPA regulations supports this conclusion. The NSPS and co-promulgated Information Collection Request (ICR) require regulated entities to submit annual compliance reports to U.S. EPA, including

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<sup>6</sup> 17 Cal. Code Regs. § 95674(b)(2), requiring owners/operators of regulated facilities or equipment to register all of the covered equipment by reporting information to CARB or the local air district, including (a) the number of crude oil or natural gas wells; (b) identification of all pressure vessels, tanks, separators, sumps, and ponds at the facility, including the size of each tank and separator in units of barrels; (c) annual crude oil, natural gas, and produced water throughput; (d) identification of all reciprocating and centrifugal natural gas compressors; and (e) a count of all natural gas powered pneumatic devices and pumps.

<sup>7</sup> 17 Cal. Code Regs. § 95669.

<sup>8</sup> 17 Cal. Code Regs. § 95668(h).

<sup>9</sup> 17 Cal. Code Regs. § 95669.

<sup>10</sup> 17 Cal. Code Regs. § 95669.

<sup>11</sup> See 40 C.F.R. §§ 60.5397a(g), 60.5365a(i)(2).

reporting about regulated entities' compliance with the NSPS LDAR.<sup>12</sup> U.S. EPA has publicly released reports that represent only a small fraction of the facilities subject to the NSPS and ICR reporting requirements.<sup>13</sup> Despite this, a preliminary analysis of the released reports demonstrates that over 2,000 facilities reported meeting the NSPS LDAR requirements.<sup>14</sup> Like California and other jurisdictions' success in implementing similar or more rigorous regulations, this widespread compliance undermines U.S. EPA's claims that NSPS compliance is infeasible or unduly burdensome.

U.S. EPA cannot simply point to California and other state regulations and walk away from its obligations under the Clean Air Act. We need strong national rules to complement California's efforts. Approximately 90 percent of the natural gas consumed in California is imported from out-of-state. As discussed in more detail later in these comments, federal rules in California would add important additional layers of enforcement and oversight. Federal rules provide needed federal oversight of national and international corporations operating in California. Federal rules impose reporting requirements that provide valuable emissions inventory data—data not easily replicated by California's efforts alone. Federal rules ensure that imported natural gas has similar rates of methane emissions to that of natural gas produced within California, and assist CARB in its efforts to reduce greenhouse gas emissions through state rules and address life-cycle greenhouse gas emissions through its Low Carbon Fuel Standard Program. Californians, particularly the most vulnerable populations and communities, experience the climate impacts of methane waste from out-of-state oil and natural gas operations.

## **II. The specific proposed amendments are arbitrary, insufficiently explained, and unsupported by the record**

Despite the demonstrated success of emissions control programs, U.S. EPA is proposing to shrink controls for new and modified sources, while entirely abandoning controls for existing sources (which emit the lion's share of pollution). This proposal

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<sup>12</sup> 81 Fed. Reg. 35,824 (June 3, 2016); U.S. EPA ICR No. 2523.01c, RIN 2060-AS30, available at [https://www.reginfo.gov/public/do/PRAViewDocument?ref\\_nbr=201807-2060-002](https://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=201807-2060-002).

<sup>13</sup> U.S. EPA made a small fraction of compliance reports publicly available in response to a Freedom of Information Act (5 U.S.C. § 552) request submitted by a number of jurisdictions, including California. See FOIA Online, FOIA Request EPA-HQ-2018-001886 Details, <https://www.foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-HQ-2018-001886&type=request>. A small number of reports that were submitted via U.S. EPA's Compliance and Emissions Data Reporting Interface are also available on U.S. EPA's public WebFIRE database. See also Letter from the State of California, CARB, et al., to Acting Administrator Wheeler (Nov. 19, 2018) (regarding a request for the remainder of the submitted compliance reports and a related extension of the deadline to comment on the proposed amendments).

<sup>14</sup> See FOIA Online, FOIA Request EPA-HQ-2018-001886 Details, <https://www.foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-HQ-2018-001886&type=request>.

departs sharply from U.S. EPA's prior positions and from the evidence. This agency action is arbitrary and capricious, in violation of sound administrative procedure.<sup>15</sup>

Changes in agency policy positions are permissible only when the agency provides reasoned justification for the change. This includes a reasoned explanation for its rejection of any previous factual findings: "In such cases it is not that further justification is demanded by the mere fact of policy change; but that a reasoned explanation is needed for disregarding facts and circumstances that underlay or were engendered by the prior policy."<sup>16</sup>

U.S. EPA's Proposed Rule fails on multiple fronts. U.S. EPA demonstrates no factual basis for rejecting or revising the conclusions set forth in the rulemaking record for the NSPS. U.S. EPA entirely fails to consider important aspects of the issues, offers justifications that run counter to the evidence before the agency, and insufficiently explains the reasons for its change and rejection of earlier determinations.

Additionally, U.S. EPA attempts to frame the Proposed Rule as merely a less-beneficial regulatory option to compare to the NSPS (or to a baseline that incorporates the 2018 proposed NSPS amendments), rather than a new and separate deregulatory action with new and significant impacts. For example, U.S. EPA writes, "The 2016 NSPS OOOOa . . . was anticipated to reduce emissions of methane, VOC, and HAP, and some of the benefits of reducing these pollutants would have accrued to children."<sup>17</sup> However, U.S. EPA is required to analyze these impacts by comparison to the status quo, not a period before U.S. EPA promulgated the NSPS (or after U.S. EPA finalizes a different proposal).

**A. U.S. EPA fails to justify its proposal to omit the transmission and storage segment from the source category**

U.S. EPA fails to provide evidence in support of its proposed removal of the transmission and storage segment from the Crude Oil and Natural Gas Production source category. The production, processing, and transmission and storage segments have extensive overlap in types of control requirement and pollutant reductions. Nothing in the statute—which requires comprehensive pollution controls—justifies ignoring pollution from half of the sector's processes, even if U.S. EPA's chemical composition claims were accurate.

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<sup>15</sup> See, e.g., *Nat'l Env'tl. Dev. Ass'n's Clean Air Project v. E.P.A.*, 686 F.3d 803, 809–10 (D.C. Cir. 2012) ("Under the CAA, we will set aside the Agency's determination only if it is arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." (internal quotation omitted)); *Ethyl Corp. v. EPA*, 51 F.3d 1053, 1064 (D.C.Cir.1995) (holding that the arbitrary and capricious standard under the CAA is interpreted in "essentially the same" way as the same standard under the APA).

<sup>16</sup> *F.C.C. v. Fox Television Stations, Inc.*, 556 U.S. 502, 515–16 (2009) (internal citation omitted).

<sup>17</sup> 84 Fed. Reg. at 50,282 (emphasis added).

Those claims are, moreover, incorrect: U.S. EPA claims, “the transmission and storage operations are distinct from production and processing operations because the natural gas that enters the transmission and storage segment has different composition and characteristics than the natural gas that enters the production and processing segments.”<sup>18</sup> While U.S. EPA compares the average composition of the production segment to the average composition of the transmission segment, the agency fails to consider the extensive overlap in the range of compositions in both segments.<sup>19, 20</sup> U.S. EPA’s own memo on the topic presents data showing the wide range of compositions of gas in the production and transmission sectors.<sup>21</sup> In the production sector, methane content ranged from 65.7 percent to 97.2 percent, while in the transmission sector the methane content varied from 91.9 percent to 95.2 percent. VOCs in the production sector ranged from 1.2 to 5.7 percent, compared to 0.2 to 6.8 percent in the transmission sector. The data U.S. EPA shows from 2011 demonstrates a wide range of compositions in both the production and transmission sectors, but the Proposal discusses only average values and omits consideration of ranges. The range of methane compositions in the production sector fully encompasses the range in the transmission sector, demonstrating the similarity of the gas composition in the two sectors. Similarly, there is extensive overlap between the sectors’ VOC compositions. Therefore, U.S. EPA’s data supports retaining the transmission and storage segment in the source category because the composition of the natural gas is similar to that of the production and processing segments.

U.S. EPA’s more recent data from a 2018 memorandum only contains updated composition data for the production segment.<sup>22</sup> Methane content in natural gas from all wells (including gas wells and oil wells with associated gas) ranged from 17.5 percent to 98.4 percent while VOC content ranged from zero to 40.9 percent. This data shows even more variation in composition than the 2011 data, further supporting the point that there is extensive overlap between the production and processing segments and the transmission and storage segment. The 2018 memorandum did not include any updated data for the transmission and storage segment; however, given the significant difference in the production segment data from 2011 and 2018, U.S. EPA must collect more current data for the transmission and storage segment if it seeks to justify any claims about the segment being sufficiently distinct from production and processing to warrant revision of the source category. But even such

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<sup>18</sup> 84 Fed. Reg. at 50,257.

<sup>19</sup> 84 Fed. Reg. at 50,258.

<sup>20</sup> U.S. EPA omits discussion of the storage segment, but the composition of gas in the storage segment should be equivalent to the composition of gas in the transmission segment, as storage gas is transmission gas in storage.

<sup>21</sup> Composition of Natural Gas for use in the Oil and Natural Gas Sector Rulemaking, July 28, 2011.

<sup>22</sup> Natural Gas Composition, November 13, 2018.

chemical differences, if they existed, would not explain why common controls and common regulations should not still apply.

In addition to the similarities in natural gas composition between the production, processing, and transmission and storage segments, the extensive overlap in the equipment and operations between segments demonstrate the unity of the sector and the utility of the existing regulatory regime—which treats the sector as fair ground for regulation. All three segments include natural gas compressors and natural gas-powered pneumatic controllers used to compress gas and operate or control valves. For example, gathering and boosting stations in the production segment and transmission compressor stations in the transmission and storage segment both move natural gas at increased pressure through pipelines, or into or out of storage. The shared definition of compressor station in the NSPS reflects this similarity: A compressor station includes both gathering and boosting stations and transmission compressor stations. U.S. EPA acknowledges the similar equipment used across the industry in the Proposal, but states that “the differences in the operations of, and the emission profiles of, the different segments are more significant and support our proposal to exclude the transmission and storage segment from the source category.”<sup>23</sup> However, U.S. EPA fails to demonstrate differences in compressor and pneumatic controller operations between the segments.

In the 2016 NSPS rulemaking, U.S. EPA stated, “the inclusion of the transmission and storage segment into the original 1979 source category was warranted because equipment and operations at production, processing, transmission and storage facilities are a sequence of functions that are interrelated and necessary for getting the recovered gas ready for distribution.”<sup>24</sup> U.S. EPA now attempts to refute this point, stating that the transmission and storage operations are distinct because of differing composition and characteristics of natural gas between the segments.<sup>25</sup> However, U.S. EPA does not dispute the interrelatedness of the segments. U.S. EPA’s point in 2016 regarding the interconnectedness of the transmission and storage segment with the rest of the source category remains true today; the transmission and storage segment is a necessary element of the source category because it prepares the recovered gas for distribution. Without transmission and storage, gas obtained from the production and processing segments could not be distributed to its end users.

#### **B. U.S. EPA fails to consider the impacts of rescinding standards for the transmission and storage sector**

U.S. EPA’s premises are not just wrong—they would create harmful emissions increases if they were followed. U.S. EPA provides limited and flawed evidence to

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<sup>23</sup> 84 Fed. Reg. at 50,258.

<sup>24</sup> 84 Fed. Reg. at 50,255.

<sup>25</sup> 84 Fed. Reg. at 50,257.

justify its proposal to rescind the NSPS for transmission and storage sources; a fair look at the sector raises concerns that U.S. EPA's proposal would increase pollution exposure, contrary to its statutory obligation to ensure standards operate in accordance with the best system of emission reduction.

U.S. EPA's calculations are spotty and unconvincing. It states that the lack of storage vessels emitting more than 6 tons of VOC per year in the transmission and storage segment supports their understanding that VOC emissions in the transmission and storage segment are lower than the production segment.<sup>26</sup> This argument is misleading because there are many fewer storage vessels in the transmission and storage segment compared to the production and processing segments. Furthermore, U.S. EPA fails to mention that the transmission and storage segment has equipment, such as pneumatic controllers and compressors, which are potentially sources of VOCs. In the proposed revised Information Collection Request (ICR) corresponding to the Proposed Rule's reporting requirements, U.S. EPA does not even include storage vessels in their calculations of changes in burden for recordkeeping and reporting requirements due to the proposed rescission of the NSPS for the transmission and storage sector: U.S. EPA focuses exclusively on centrifugal compressors, reciprocating compressors, and pneumatic controllers.<sup>27</sup> U.S. EPA presents a misleading argument by focusing on VOC emissions from storage vessels rather than other equipment that is more widespread in the transmission and storage segment.

In addition to VOCs, the transmission and storage segment is a source of HAP emissions. While U.S. EPA presents data on VOC and HAP emissions in the transmission and storage segment, it fails to provide any context regarding what level of emissions would be dangerous to human health.<sup>28</sup> Indeed, while U.S. EPA notes that "just a few pounds of some metals (i.e., Hexavalent Chromium) is more toxic than a ton of benzene" (another HAP),<sup>29</sup> the agency fails to estimate the quantities of different HAPs likely emitted as a result of the Proposed Rule or estimate the impacts of any HAP emissions.

The HAP emission data that U.S. EPA does include is conflicting, and likely incorrect. According to U.S. EPA, the transmission and storage segment emitted 1,143 tons of HAP in 2014.<sup>30</sup> However, U.S. EPA also claims that the primary proposal will lead to an increase in HAP emissions of 300 tons from 2019 to 2025 relative to the current regulatory baseline. Given the 2014 emissions, if U.S. EPA removes regulatory requirements from the transmission and storage segment, we expect HAP emissions

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<sup>26</sup> 84 Fed. Reg. at 50,258.

<sup>27</sup> Draft Supporting Statement Oil and Gas Review 2060-AT90, p. 12.

<sup>28</sup> 84 Fed. Reg. at 50,259.

<sup>29</sup> Regulatory Impact Analysis for the Proposed Oil and Natural Gas Sector Emission Standards for New, Reconstructed, and Modified Sources Review (RIA), Aug. 2019, Docket ID No. EPA-HQ-OAR-2017-0757-0004, p. 3-21.

<sup>30</sup> 84 Fed. Reg. at 50,259.

would increase significantly—to more than 300 tons over 6 years. Using U.S. EPA's 2014 emissions as an estimate for each year from 2019 to 2025, the estimated emissions increase should be closer to 7,000 tons.

Rescinding the NSPS for sources in the transmission and storage segment would also have a significant impact on nationwide methane emissions. Pursuant to CARB's Oil and Gas Methane Regulation, oil and natural gas facilities in California, including natural gas underground storage facilities, are required to conduct quarterly LDAR surveys of all components and report the results to CARB annually.<sup>31</sup> Preliminary data from operators reporting for 2018 show that over 2,600 leaks were discovered and repaired at 11 natural gas underground storage facilities, with an average concentration before repair of over 40,000 parts per million, and less than 200 parts per million after repair. This demonstrates that regulatory LDAR programs are effective at reducing emissions. Furthermore, the reporting data shows the extent of leaks occurring in the storage segment, highlighting the need for continued regulation of the segment nationwide by the NSPS.

These gaps are of considerable importance to Californians, if they were to be reflected in weakened federal rules. Federal rules provide important additional enforcement oversight even in states with their own state rules by creating obligations under the federal Clean Air Act that may be enforced by U.S. EPA or citizen suit—and, of course, matter a great deal nationally where other rules are not in force. Although California's Oil and Gas Methane Regulation would still regulate the transmission and storage segment in California,<sup>32</sup> California imports approximately 90 percent of the natural gas the state uses. Therefore, under the Proposed Rule, the imported gas could have a significantly higher rate of methane emissions before its importation into California. The carbon impact of gas imported to California would increase, undermining state and national efforts to reduce greenhouse gas emissions.

If U.S. EPA rescinds the NSPS for the transmission and storage sector, sources in that sector would no longer be subject to the NSPS's recordkeeping or reporting requirements. Regulatory reporting requirements provide valuable emissions information that is useful for many programs, including emissions inventories. California utilizes emissions inventories to estimate greenhouse gas emissions associated with imported natural gas pursuant to state law.<sup>33</sup> The proposed elimination of reporting requirements for the transmission and storage segment would negatively impact these efforts.

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<sup>31</sup> 17 Cal. Code Regs. §§ 95669, 95673.

<sup>32</sup> 17 Cal. Code Regs. §§ 95665–77.

<sup>33</sup> Cal. Health and Safety Code section 39607 (amended by Assembly Bill 2195, Chap. 371, Stats. 2018).

**C. U.S. EPA fails to justify its rescission of methane requirements and fails to disclose its impetus**

U.S. EPA also proposes to drop methane control requirements entirely from its current rule, claiming that the Proposed Rule is intended to “remov[e] regulatory duplication”<sup>34</sup> and to “provide for greater clarity by simplifying” the NSPS.<sup>35</sup> U.S. EPA states that the methane requirements for the production and processing segments “are entirely redundant with the existing NSPS for VOCs, establish no additional health protections, and are, thus, unnecessary.”<sup>36</sup> U.S. EPA misrepresents both the law and the technology at issue.

As noted above, the CAA gives agencies the onus of justifying amendments to duly promulgated regulations. Agencies may only reverse policy positions by providing reasoned justification for the change, and “the requirement that an agency provide reasoned explanation for its action would ordinarily demand that it display awareness that it is changing position.”<sup>37</sup> Even if the NSPS’s methane requirements were entirely redundant to its VOC provisions, therefore, U.S. EPA may not summarily jettison the methane requirements as it proposes. As it turns out, the controls are not redundant and—critically—are necessary to regulate *existing* sources. That means that abandoning them would functionally exempt a huge portion of the industry from federal methane regulation, with consequences for emissions wholly contrary to the Clean Air Act’s pollution control mandates.

Methane controls are not redundant, even with regard to new and modified sources that are also controlled for VOCs. The NSPS does not simply duplicate requirements for emission controls; rather, it allows, but does not require, operators to comply with both VOC and methane controls using the same practices. U.S. EPA asserts that the NSPS’s methane and VOC controls are redundant because “[t]he capture and control devices that the emission sources use to meet the NSPS requirements are the same for these co-pollutants and are not selective with respect to either VOC or methane emissions.”<sup>38</sup> While this is generally the case at present, such selective technologies do exist, and could be applied to reduce VOC but not methane emissions if the methane rescission is finalized. For example, activated carbon adsorbers control VOCs but not methane: the technology is useful for removing VOCs from gaseous streams, but methane is a very weakly adsorbed compound.<sup>39</sup> Industry does not currently use this technology to comply with the NSPS. But industry could potentially use this technology to comply cost-effectively with a VOCs-only NSPS if U.S. EPA finalizes its

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<sup>34</sup> 84 Fed. Reg. at 50,246.

<sup>35</sup> 84 Fed. Reg. at 50,254.

<sup>36</sup> 84 Fed. Reg. at 50,259.

<sup>37</sup> *Fox Television Stations*, 556 U.S. at 515.

<sup>38</sup> 84 Fed. Reg. at 50,259.

<sup>39</sup> Activated Carbon Adsorption for Treatment of VOC Emissions, available: <https://www.carbtrol.com/images/white-papers/voc.pdf>.

proposed methane rescission. U.S. EPA also acknowledges new technologies currently under development that "would detect speciated fugitive emissions from oil and natural gas operations,"<sup>40</sup> potentially allowing operators to comply with a VOCs-only NSPS by controlling VOCs while leaving methane emissions unabated. U.S. EPA thus fails to consider the impact of these VOC-only technologies to future methane emissions in the absence of the current NSPS.

**D. U.S. EPA fails to consider the impact of non-regulation of existing sources.**

U.S. EPA's proposal attempts to evade an important distinction between the VOC and methane NSPS: controls of existing sources. While U.S. EPA acknowledges that Clean Air Act section 111(b), concerning new and modified sources, applies to both VOCs and methane, U.S. EPA states that Clean Air Act section 111(d), concerning existing sources, applies to methane but not to VOCs.<sup>41</sup> As VOCs are an ozone precursor, U.S. EPA argues, VOCs from existing sources are controlled under Clean Air Act sections concerning NAAQS and their precursors.<sup>42</sup> While U.S. EPA is required to develop emissions guidelines under section 111(d) for methane controlled under section 111(b), U.S. EPA asserts that it need only provide state and local regulators with information on possible control options, in the form of "Control Technique Guidelines," for existing sources of VOCs.<sup>43</sup> As such, U.S. EPA asserts that rescinding the methane NSPS would leave existing oil and natural gas sources unregulated at the federal level under CAA section 111(d).<sup>44</sup> Thus, under U.S. EPA's reasoning, one of the largest U.S. sources of methane pollution would escape regulation, at the very time that the climate crisis requires emissions control. U.S. EPA has determined that this crisis endangers public health and welfare; it may not legally shirk its obligation to take action.

U.S. EPA concedes that the proposed methane rescission, alternately, would "obviate the need for the development of emission guidelines under CAA section 111(d) and 40 CFR part 60, subpart B to address methane emissions from existing sources within

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<sup>40</sup> 84 Fed. Reg. at 50,260.

<sup>41</sup> 84 Fed. Reg. at 50,272. Sec. 111(d): "(1) The Administrator shall prescribe regulations which shall establish a procedure similar to that provided by section 7410 of this title under which each State shall submit to the Administrator a plan which (A) establishes standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 7408(a) of this title or emitted from a source category which is regulated under section 7412 of this title but (ii) to which a standard of performance under this section would apply if such existing source were a new source, and (B) provides for the implementation and enforcement of such standards of performance."

<sup>42</sup> CAA §§ 108, 182(b)(2)(A), 183(c)-(e), and 184(b).

<sup>43</sup> Sec. 108(b). Additionally, U.S. EPA has proposed to withdraw its Control Technique Guidelines for VOC emissions from this sector.

<sup>44</sup> 84 Fed. Reg. at 50,259.

the crude oil and natural gas production industry[,]”<sup>45</sup> and would “mean that existing sources of the same type in the source category will not be subject to regulation under CAA section 111(d).”<sup>46</sup> However, U.S. EPA shrugs, “this is a legal consequence that results from the application of the CAA section 111 requirements.”<sup>47</sup> U.S. EPA barely bothers to profess that this outcome is a side effect of its unrelated effort to reduce “regulatory duplication,” and not the intent of the proposal. It may not ignore these impacts. Section 111 is an integrated emissions control program, such that existing sources of dangerous pollutants must also be controlled. Breaking that program by declining to regulate those pollutants for new and modified sources is not a “side effect”; it thwarts Congress’s direction to ensure the public is protected from dangerous pollutants from Section 111 source categories, whether sources are new or existing. U.S. EPA must reckon with the consequences of the decision it is proposing to take.

Clean Air Act section 307(d) requires U.S. EPA to provide “the major legal interpretations and policy considerations underlying the proposed rule,” and the CAA permits changes in agency policy positions only when the agency provides reasoned justification for the change. Here, U.S. EPA has done neither.

Additionally, as noted above, rulemaking violates the Administrative Procedure Act—and similarly here, the CAA—“if the agency has . . . entirely failed to consider an important aspect of the problem[.]”<sup>48</sup> U.S. EPA has declined to consider the direct, and undoubtedly intentional, impact of its proposed methane rescission on its current obligation to regulate existing sources. While U.S. EPA claims that “[a]nalysis of potential impacts of removing the requirement to regulate existing sources under 111(d) is outside the scope . . . and would be speculative[.]”<sup>49</sup> U.S. EPA’s refusal to consider these impacts renders its proposal unlawful.

U.S. EPA attempts to downplay the likely impact from its non-regulation of existing sources, claiming, “the lack of regulation of existing sources under CAA section 111(d) will not mean a substantial amount of lost emission reductions.”<sup>50</sup> However, U.S. EPA fails either to define what it means by “substantial” or to provide evidence to support this claim.

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<sup>45</sup> 84 Fed. Reg. at 50,254.

<sup>46</sup> 84 Fed. Reg. at 50,272.

<sup>47</sup> 84 Fed. Reg. at 50,272.

<sup>48</sup> *Motor Vehicle Mfrs. Ass’n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

<sup>49</sup> Regulatory Impact Analysis for the Proposed Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review, August 2019, EPA-452/R-19-001, p. 1–3.

<sup>50</sup> 84 Fed. Reg. at 50,271.

### **III. Assertions that existing-source regulations are unnecessary are contradictory and unsupported**

U.S. EPA provides a long list of reasons that regulation of existing sources is unnecessary, none of which are supported, and some of which are undermined, by U.S. EPA's own data.

U.S. EPA asserts that existing-source regulations are unnecessary because existing sources become subject to the NSPS when they undergo modification. The agency purports to qualitatively support its claim by stating that the NSPS's "very broad" "definition and approach to determining new source applicability . . . can be anticipated to result in wide applicability of the NSPS to existing sources due to the frequency with which such sources can be reasonably expected to engage in 'modification' activity."<sup>51</sup> U.S. EPA has both Title V permits and three years of new source reporting under the NSPS, which it presumably would cite if the data supported this claim. However, U.S. EPA provides no data demonstrating the frequency that sources have engaged in modification activity that renders them subject to the NSPS.

U.S. EPA posits that "it is reasonable to expect that the number of existing sources may decline over time due to obsolescence or to shut down and removal actions."<sup>52</sup> However, U.S. EPA presents only data contrary to this hypothesis. When discussing equipment turnover rates, U.S. EPA states that "if many existing storage vessels were being replaced . . . we may expect production throughput at large uncontrolled storage tanks to decline, with corresponding increases at controlled tanks."<sup>53</sup> The proposal notes, "Oil production throughput at large storage vessels without controls increased by 18 percent from 2011 to 2017."<sup>54</sup> Moreover, U.S. EPA has proposed to freeze or roll back the stringency of federal GHG emissions standards for light-duty vehicles, conceding in that proposal that increased U.S. oil and natural gas production would result. Thus, the premises of this rulemaking are strongly contradicted by U.S. EPA's other actions. If U.S. EPA finalizes the light-duty vehicle rollback, it cannot maintain that emissions from the oil and natural gas sector will decline. These statements and actions further undermine U.S. EPA's unsupported claims.

U.S. EPA also claims, without evidence, that the lack of federal regulation of existing sources will not result in "a substantial amount of lost emission reductions" because existing sources will be retired, will undergo modifications and become subject to the

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<sup>51</sup> 84 Fed. Reg. at 50,273.

<sup>52</sup> 84 Fed. Reg. at 50,273.

<sup>53</sup> 84 Fed. Reg. at 50,273.

<sup>54</sup> 84 Fed. Reg. at 50,273.

NSPS, or will have their emissions controlled or reduced by other federal regulations, state regulations, voluntary programs, and market forces.<sup>55</sup>

The other federal regulations on which U.S. EPA relies are a Bureau of Land Management regulation that has been repealed (and that only applied to federal and Indian lands while it was in effect),<sup>56</sup> and safety regulations that EPA merely says “likely [have] a corresponding environmental co-benefit[.]”<sup>57</sup>

Despite asserting that state regulations adequately reduce emissions from existing sources, U.S. EPA solicits comment describing, “whether there are enough consistent state regulations in place that will meaningfully reduce emissions should the primary proposal be finalized.”<sup>58</sup> U.S. EPA fails to define “meaningfully reduce emissions” or explain why this is the standard—as no such requirement appears in statute. While U.S. EPA claims, “many of the top oil and natural gas-producing states have developed or are developing regulations that require emissions reductions,”<sup>59</sup> U.S. EPA does not provide quantitative analysis of state requirements.

In any event, the Clean Air Act explicitly directs U.S. EPA, not the states, to impose appropriate control requirements (per Section 111); moreover, 42 U.S.C. § 7401, the first section of the Act, directs U.S. EPA to be a good and supportive partner to the states. Declining to implement federal standards functionally shifts obligations to the states, contrary to the Act’s cooperative federalism design and contrary to U.S. EPA’s specific statutory mandate in Section 111 to set appropriately stringent federal baseline standards. Setting such standards is particularly important here to avoid races to the bottom among the states on oil and natural gas regulatory stringency, and to ensure that production is controlled appropriately across the entire national oil and natural gas system. This task is quintessentially federal, and may not be shrugged off just because some states have been forced to fill gaps left by federal inaction.

Table 9 of the Proposal preamble provides a list of States that regulate emissions from any affected source, many of which only regulate a subset of the types of sources. U.S. EPA asserts that the listed States “contributed about 71 percent of crude oil production and 69 percent of natural gas production” in 2018, but does not expressly

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<sup>55</sup> 84 Fed. Reg. at 50,271 and 50,253–254.

<sup>56</sup> 84 Fed. Reg. at 50,253–54. U.S. EPA notes BLM’s 2018 “amendments to reduce compliance burden” without acknowledging that they actually comprised a wholesale rescission of the rule. See Waste Prevention, Production Subject to Royalties, and Resource Conservation; Rescission or Revision of Certain Requirements, 83 Fed. Reg. 49,184 (Sept. 28, 2018).

<sup>57</sup> 84 Fed. Reg. at 50,254, referencing Pipeline and Hazardous Materials Safety Administration regulations.

<sup>58</sup> 84 Fed. Reg. at 50,277.

<sup>59</sup> 84 Fed. Reg. at 50,274.

acknowledge that the listed States regulated a far smaller percentage of sources than the NSPS.<sup>60</sup>

As part of the proposed 2018 NSPS amendments, U.S. EPA published a memorandum comparing various State fugitive emissions programs for well sites and compressor stations to the proposed revisions to determine which state programs were equivalent to the proposed rule.<sup>61</sup> CARB's comments on the proposed 2018 NSPS amendments identified deficiencies in the State equivalency memorandum, including U.S. EPA's failure to quantify emission reductions from the States' rules and perform a more detailed comparison than qualitative program components, rendering the equivalency determinations unjustified. Additionally, CARB explained that because the 2018 proposed NSPS amendments themselves are unlawful and impermissible, U.S. EPA cannot extend alternative means of emission limitation (AMEL) to state programs that are equivalent only to the 2018 proposed amendments but not the existing NSPS. U.S. EPA proposed in the 2018 proposed amendments that only the State LDAR programs of California, Colorado, Ohio, Pennsylvania, Texas,<sup>62</sup> and Utah are equivalent to the proposed 2018 amended NSPS.<sup>63</sup> Comparing these LDAR equivalency determinations to the Proposed Rule, U.S. EPA attempts to rely on the State programs of four States (Montana, North Dakota, New Mexico, and Wyoming) with regulatory programs that the agency has determined are less stringent than the proposed 2018 NSPS amendments, let alone the existing NSPS. In addition to being unsupported, U.S. EPA's claim that these States' programs compensate for federal non-regulation of existing sources is disingenuous.

By contrast, the States that U.S. EPA identified as having equivalent LDAR programs to the proposed 2018 NSPS amendments comprise only three of the top 10 crude oil producing States and four of the top 10 natural gas producing States.<sup>64</sup> Excluding Texas<sup>65</sup> reduces these numbers to only two and three of the top 10, respectively. This further demonstrates the inaccuracy of U.S. EPA's claim that the top oil and natural gas producing States' regulations would sufficiently compensate for a lack of federal regulation of existing sources.

Voluntary measures and programs are inadequate to address emissions from existing sources because they cannot be enforced, lack accountability, and depend on market

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<sup>60</sup> 84 Fed. Reg. at 50,277.

<sup>61</sup> Equivalency of State Fugitive Emissions Programs for Well Sites and Compressor Stations to Proposed Standards at 40 CFR part 60, Subpart OOOOa, April 12, 2018, Docket ID No. EPA-HQ-OAR-2017-0483.

<sup>62</sup> In comments submitted to U.S. EPA on December 17, 2018 (Docket ID No. EPA-HQ-OAR-2017-0483-0785), CARB described issues with U.S. EPA's equivalency determination for Texas due to different leak definitions based on equipment types. See p. 17.

<sup>63</sup> 83 Fed. Reg. at 52,081.

<sup>64</sup> Based on 2017 production data from the U.S. Energy Information Administration (U.S. EIA).

<sup>65</sup> See footnote 62.

forces, business considerations, and/or corporate benevolence. Regulations are necessary to ensure that all existing sources reduce their emissions, not just select operators who opt into voluntary programs.

Market forces, U.S. EPA alleges, are adequate to control existing-source emissions, “assuming financially rational-acting producers.”<sup>66</sup> The assumption that “financially rational-acting producers” will incorporate *privately* cost-effective production improvement is a prediction of producer theory with respect to a profit-maximizing firm. However, this assumption is not only unsupported but also contradicted. There are numerous complicating factors that will result in firms behaving differently than as simple theory might suggest, including financial constraints, principal-agent problems, uncertainty regarding future economic and financial conditions, and hyperbolic discounting of future returns. U.S. EPA acknowledges one confounding issue to this assumption: operators do not typically own the natural gas they transport, and only receive payment for their transportation service.<sup>67</sup> Given this fact, it is unlikely that an operator would find the emission controls *privately* “cost-effective,” as they lack a mechanism to earn a return on their investment.

The assumption of rational actors is inconsistent with the rationale for numerous other federal rules that regulate fuel efficiency and energy efficiency standards. Although these regulations typically show substantial cost-savings to end-users, yielding positive returns over a lifecycle, it is still necessary for regulators to set requirements for these to ensure that businesses and individuals actually purchase pollution control or less-polluting equipment and that manufacturers produce it.

Additionally, historical evidence suggests that market incentives are not sufficient; natural gas prices were significantly higher over the past decade than they are currently (see chart below), giving business larger financial incentives to make such investments than exist currently, yet improved equipment still has not been widely adopted by the industry.

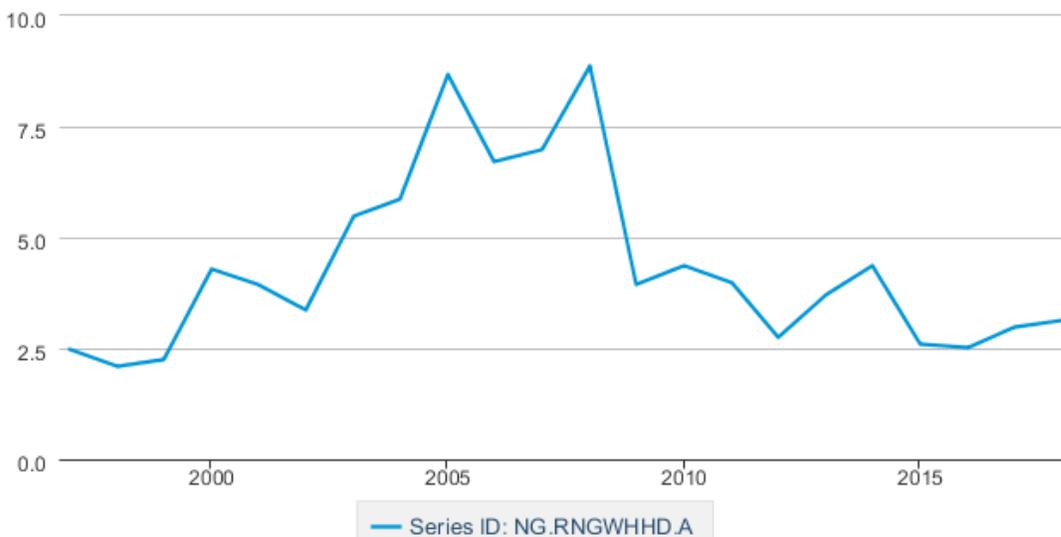
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<sup>66</sup> 84 Fed. Reg. at 50,274.

<sup>67</sup> RIA at 2–15.

### Henry Hub Natural Gas Spot Price, Annual

Dollars per Million Btu



 Source: U.S. Energy Information Administration

Finally, to illustrate the faultiness of the assumption that market forces will control emissions, one could simply pose the question: if these production improvements are so cost-effective for operators, why have they not already been widely adopted by industry?

#### IV. The economic analysis is biased, incomplete, and does not justify the Proposed Rule

U.S. EPA's Regulatory Impact Analysis (RIA) fails to demonstrate that the Proposal would provide overall benefits or improve the cost-effectiveness of the NSPS. This failure demonstrates that the Proposal does not, in fact, reflect the best system of emissions reduction because it shows that the Proposal would result in economically inefficient and environmentally damaging behavior.

The RIA uses multiple assumptions and methodologies to minimize quantification of climate harm, and omits quantification of many costs and associated harms of the proposed regulation, which result in an inaccurate and biased cost-benefit analysis. This analysis cannot support the Proposal.

##### A. Background on the social cost of methane

The social cost of methane (SC-CH<sub>4</sub>) is the cost to society (in U.S. dollars) of adding 1-metric ton of CH<sub>4</sub> to the atmosphere in a particular year; it is intended to provide a

measure of the damages from global climate change. Framed alternatively, it is the avoided cost (or benefit) of reducing CH<sub>4</sub> emissions by the same amount in a given year. The SC-CH<sub>4</sub> is a critically important metric to estimate accurately, because U.S. EPA justifies its Proposed Rule, in large part, as providing net cost-savings—a conclusion that U.S. EPA can only reach by manipulating the SC-CH<sub>4</sub> value it applies to the analysis. Additionally, without an accurate estimation of the SC-CH<sub>4</sub>, U.S. EPA cannot provide the informed analysis required by law.

In 2008, the U.S. Ninth Circuit Court of Appeals set aside the National Highway Transportation Safety Administration's (NHTSA) 2006 Corporate Average Fuel Economy (CAFE) standard as arbitrary and capricious because it failed to monetize the benefits of GHG emission reductions.<sup>68</sup> There, the court characterized reductions in carbon emissions as "the most significant benefit of more stringent CAFE standards."<sup>69</sup> Subsequently, federal agencies have incorporated the social costs of GHGs, including carbon dioxide, methane, and nitrous oxide, into their analysis of regulatory actions in an effort to comprehensively account for the economic impact of regulations that impact GHG emissions.

Beginning in 2009, the President's Council of Economic Advisors and the U.S. Office of Management and Budget (OMB) convened the Interagency Working Group (IWG) on the Social Cost of GHGs (SC-GHG) to develop a methodology for estimating the social cost of carbon (SC-CO<sub>2</sub>) and other GHGs. This methodology relied on a standardized range of assumptions that could be used consistently when estimating the benefits of regulations across agencies. The IWG, comprised of scientific and economic experts, recommended the use of SC-CH<sub>4</sub> values based on three integrated assessment models (IAMs) developed over decades of global peer-reviewed research.<sup>70</sup> William Nordhaus, awarded the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel in 2018 and a member of the IWG,<sup>71</sup> defines IAMs as "approaches that integrate knowledge from two or more domains into a single framework."<sup>72</sup> IAMs used in the estimation of the SC-CH<sub>4</sub> combine models of the global economy and atmosphere to estimate geophysical and economic variables over

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<sup>68</sup> *Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1203 (9th Cir. 2008).

<sup>69</sup> *Id.* at 1199.

<sup>70</sup> See IWG, Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide, Aug. 2016 ("IWG Addendum"), available at [https://www.epa.gov/sites/production/files/2016-12/documents/addendum\\_to\\_sc-ghg\\_tsd\\_august\\_2016.pdf](https://www.epa.gov/sites/production/files/2016-12/documents/addendum_to_sc-ghg_tsd_august_2016.pdf).

<sup>71</sup> The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2018, <https://www.nobelprize.org/prizes/economics/2018/summary/>.

<sup>72</sup> William Nordhaus, Integrated economic and climate modeling, *Handbook of computable general equilibrium modeling*, ed. Peter Dixon and Dale Jorgenson, 2013, 1069–1131.

time.<sup>73</sup> Given the complexity of IAMs, the IWG provided guidance in transparency of methodology and assumptions as well as consistency across the input and models used to estimate the SC-CH<sub>4</sub>, issued as TSDs.<sup>74</sup> These models and methodologies have been modified and updated since first being utilized, and represent the best available science in the field.

U.S. EPA is bound to use the best available science when setting standards and analyzing alternatives. It is further directed by E.O. 12866 (as modified by E.O. 13563) to conduct a cost-benefit analysis for all economically significant regulations that is based on the “best available science,” use the “best available techniques” to quantify anticipated present and future benefits and costs, and use the best reasonably obtainable scientific, technical, and economic information.<sup>75</sup> OMB Circular A-4 further directs U.S. EPA actions in preparing regulatory analysis under E.O. 12866.<sup>76</sup> OMB Circular A-4 requires U.S. EPA to quantify anticipated benefits and costs of proposed rulemakings as accurately as possible using the best available techniques, and to ensure that any scientific and technological information or processes used to support their regulatory actions are objective.<sup>77</sup>

On March 28, 2017, the Presidential Executive Order on Promoting Energy Independence and Economic Growth, E.O. 13783, disbanded the IWG, withdrew the TSDs issued by the IWG, and instead directed all federal agencies to follow the guidance in OMB Circular A-4 when monetizing the value of changes in GHG emissions resulting from regulatory changes.<sup>78</sup> E.O. 13783 is internally contradictory: it withdrew the IWG’s peer-reviewed TSDs as no longer representative of governmental policy, while directing agencies to base their regulatory analysis on the best available science and economics and OMB Circular A-4 (which it noted was “issued after peer review and public comment and has been widely accepted for more than a decade as embodying the best practices for conducting regulatory cost-benefit analysis.”)<sup>79</sup>

The E.O.’s direction to disband the IWG and withdraw peer-reviewed and vetted scientific documents does not call into question the validity and scientific integrity of the IWG’s SC-GHG estimates, or the merit of independent scientific work in regulatory processes. This E.O. provided no rationale or defense of this withdrawal and offers no scientific or economic rationale for the changed SC-GHG valuations,

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<sup>73</sup> See IWG Addendum.

<sup>74</sup> See IWG Addendum.

<sup>75</sup> E.O. 12866, “Regulatory Planning and Review,” Sept. 30, 1993; Executive Order 13563, “Improving Regulation and Regulatory Review,” Jan. 18, 2011.

<sup>76</sup> OMB Circular A-4, Sept. 17, 2003, available at <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf>.

<sup>77</sup> OMB Circular A-4, Sept. 17, 2003, available at <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf>.

<sup>78</sup> 82 Fed. Reg. 16,093 (March 31, 2017).

<sup>79</sup> 82 Fed. Reg. 16,093 (March 31, 2017) at § 5(c), citing OMB Circular A-4.

which are counter to existing U.S. EPA Guidance and the consensus of experts.<sup>80</sup> E.O. 13783 requires agencies to follow contradictory statutory and executive mandates when monetizing the social cost of GHGs that simultaneously require using the best available science, while also purporting to prohibit the use of the best available science on the subject. The IWG's work remains relevant, reliable, and appropriate for use for these purposes. CARB supports continued use of the IWG SC-CH<sub>4</sub> values and strongly suggests that U.S. EPA support and promote the IWG SC-CH<sub>4</sub> values for transparency and consistency of regulatory analyses, including for the Proposed Rule.

**B. Application of "interim domestic" social cost of methane is unjustified, inappropriate, and outcome-seeking**

As noted above, the U.S. Ninth Circuit Court of Appeals set aside NHTSA's CAFE standard as arbitrary and capricious because it disregarded the benefits of GHG emission reductions.<sup>81</sup> The court held, "NHTSA . . . cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent [CAFE] standards."<sup>82</sup> U.S. EPA's SC-CH<sub>4</sub> analysis, presented in the preamble and RIA for the Proposed Rule, is undermined similarly by several fatal flaws: utilization of an inappropriate and poorly modeled "interim domestic" social cost of methane, and presentation of only two inappropriate discount rates (which are inconsistently applied). These errors lead to social cost values that are a fraction of those used in hundreds of regulatory proceedings at the federal level. The "interim domestic" SC-CH<sub>4</sub> is in direct violation of U.S. EPA's statutory mandates, Executive Orders 12866, 13563, and 13783, and Circular A-4.

In the NSPS RIA, U.S. EPA quantified the benefits of the proposed rule using the IWG SC-CH<sub>4</sub>. U.S. EPA's economic analysis showed that global climate benefits generally<sup>83</sup> outweigh the compliance costs, providing justification for the proposal based on this metric alone, though U.S. EPA identified other benefits.<sup>84</sup> The interim domestic SC-CH<sub>4</sub> used for the Proposed Rule, however, is between 6.6 and 8.2 times lower in value than the global SC-CH<sub>4</sub> for 2020 through 2025 based on U.S. EPA data for this

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<sup>80</sup> E.g., Drupp, Moritz, et al., Discounting Disentangled, *American Economic Journal: Economic Policy*, 10 (4): 109–34, 2018, available at <https://www.aeaweb.org/articles?id=10.1257/pol.20160240&&from=f>.

<sup>81</sup> *Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1203 (9th Cir. 2008).

<sup>82</sup> *Center for Biological Diversity*, 538 F.3d at 1203.

<sup>83</sup> Benefits outweigh compliance costs when a discount rate of 2.5% or 3% is used, but not when a discount rate of 5% is used.

<sup>84</sup> Regulatory Impact Analysis of the Final Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, May 2016, Docket ID No. EPA-HQ-OAR-2010-0505-7630, Table 1-2.

proposal.<sup>85</sup> This change is outcome-seeking; U.S. EPA is attempting to minimize quantification of the harms associated with the proposal.

**C. The “interim domestic” SC-CH<sub>4</sub> violates directives requiring use of the best available science**

The RIA for the Proposed Rule utilizes an “interim domestic” SC-CH<sub>4</sub> valuation that contradicts E.O. 13783’s directive for estimates used in regulatory analyses to be “based on the best available science and economics.”<sup>86</sup> The “interim domestic” SC-CH<sub>4</sub> also breaks with almost a decade of accepted peer-reviewed methodologies without rationale or justification and does not rely on the best available science and economics.

A domestic SC-CH<sub>4</sub> cannot follow the best available science because the existing IAMs used to estimate the SC-CH<sub>4</sub> are not calibrated for domestic-only valuations. In the 2010 TSD for the Social Cost of Carbon, the IWG states, “As an empirical matter, the development of a domestic SC-CO<sub>2</sub> is greatly complicated by the relatively few region- or country-specific estimates of the SC-CO<sub>2</sub> in the literature.”<sup>87</sup> The IWG determined that a range of values from seven to twenty-three percent of the global social cost value might be used to adjust the global SC-CO<sub>2</sub> to calculate domestic effects.<sup>88</sup> However, the IWG cautions, “[T]hese values are approximate, provisional, and highly speculative. There is no a priori reason why domestic benefits should be a constant fraction of net global damages over time.”<sup>89</sup>

In 2017, the National Academies of Sciences, Engineering, and Medicine released a report examining potential approaches for a comprehensive update to the social cost of carbon methodology to ensure resulting cost estimates reflect the best available science.<sup>90</sup> The report highlights the challenges in developing domestic SC-GHG estimates, given complex interactions related to migration, and economic and political destabilization.<sup>91</sup> Revising SC-GHG values to consider only domestic impacts without modifying the IAMs violates the expert recommendations of the National Academies:

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<sup>85</sup> Proposal RIA, Benefits and Tables OOOOa Reconsideration, Tab “SCCH<sub>4</sub>,” Docket ID No. EPA-HQ-OAR-2017-0483-0082, *available* at <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2017-0483-0082&attachmentNumber=1&contentType=excel12book>.

<sup>86</sup> 82 Fed. Reg. 16,093 (March 31, 2017), § 5(c).

<sup>87</sup> Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, Feb. 2010, *available* at [https://www.epa.gov/sites/production/files/2016-12/documents/scc\\_tsd\\_2010.pdf](https://www.epa.gov/sites/production/files/2016-12/documents/scc_tsd_2010.pdf).

<sup>88</sup> Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, Feb. 2010, at 11.

<sup>89</sup> Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, Feb. 2010, at 11.

<sup>90</sup> National Academies.

<sup>91</sup> National Academies.

“Estimation of the net damages per ton of [GHG] emissions to the United States alone, beyond the approximations done by the IWG, is feasible in principle; however it is limited by the existing SC-IAM methodologies, which focus primarily on global estimates and do not model all relevant interactions among regions.”<sup>92</sup>

**D. Use of a “domestic perspective” to calculate the SC-CH<sub>4</sub> is unjustified and inappropriate**

The “interim domestic” SC-CH<sub>4</sub> is inconsistent with the OMB Circular A-4’s guidance that analysis “should focus on benefits and costs that accrue to citizens and residents of the United States,” and “where . . . a regulation that is likely to have effects beyond the borders of the United States, these effects should be reported separately.”<sup>93</sup> GHGs create important impacts to the United States and U.S. citizens that do not stop at the U.S. border. These include impacts to U.S. citizens, including U.S. military service members, who live abroad and/or have significant investments abroad. The “interim domestic” SC-CH<sub>4</sub> also ignores impacts to national security through potential impacts to trade flows and global commodity markets. The Defense Authorization Act of 2018 acknowledges the global impacts of climate change, including some of the ways in which foreign impacts impose domestic costs, such as sea level rise that threatens U.S. military sites abroad and drought and famine that lead to failed states, “which are breeding grounds of extremist and terrorist organizations.”<sup>94</sup> The National Academies agree:

It is important to consider what constitutes a domestic impact in the case of a global pollutant that could have international implications that impact the United States. More thoroughly estimating a domestic SC-CO<sub>2</sub> would therefore need to consider the potential implications of climate impacts on, and actions by, other countries, which also have impacts on the United States.<sup>95</sup>

Because these impacts are not included in the domestic SC-CO<sub>2</sub> or SC-CH<sub>4</sub>, these values likely underestimate the true cost to the United States.

If the global SC-CH<sub>4</sub> is applied, rather than the interim domestic SC-CH<sub>4</sub>, the adverse climate impacts now more than offset any estimated compliance cost savings of the proposed rule, such that the benefits of the proposal no longer exceed the costs at

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<sup>92</sup> National Academies at 12.

<sup>93</sup> OMB Circular A-4, *but see California v. Bureau of Land Management*, 286 F.Supp.3d 1054, 1069-70 (N.D. Cal. 2018) (citing Circular A-4, along with Executive Order 13783, as a factual basis for the use of a domestic social cost of methane).

<sup>94</sup> Public Law 115-91, 131 Stat. 1283, § 335 (Dec. 12, 2017).

<sup>95</sup> National Academies, Conclusion 2-4. The social costs of methane have the same considerations as the social cost of carbon.

the 3% discount rate (Table 1).<sup>96</sup> Additionally, this along with proper quantification of other costs of the proposal (described in the next section) would result in an even worse benefit-cost ratio, indicating that this proposal is a bad decision in terms of economic efficiency.

Table 1: Comparison of benefits and costs for the proposal using the domestic versus global SC-CH<sub>4</sub><sup>97</sup> relative to the Current Regulatory Baseline

Analysis Item	7% discount rate		3% discount rate	
	Domestic	Global	Domestic	Global
Cost Savings to Industry	\$97	\$97	\$123	\$123
Costs—Forgone Climate Benefits <sup>98</sup>	\$13	\$96	\$52	\$402
<b>Net Benefits—SC-CH<sub>4</sub></b>	<b>\$83</b>	<b>\$1</b>	<b>\$70</b>	<b>-\$280</b>

*\*Values may not sum due to rounding.*

Further, the RIA acknowledges that the SC-CH<sub>4</sub> does not account for all potential harms and costs, including, for example, “direct health and welfare impacts associated with tropospheric ozone production by methane,” and U.S. EPA does not account for them in any other way.<sup>99</sup> These health impacts could adversely affect individuals in the United States, resulting in multiple costs for hospitalizations and emergency room visits, which ultimately could impose new costs on individuals, private businesses who employ these workers, private insurance companies, and government agencies who provide health services. Excluding these costs results in an incomplete and biased cost-benefit analysis.

#### E. Considering discount rates of only 3 and 7 percent is inappropriate

The RIA for the Proposed Rule incorporates only two discount rates (3 and 7 percent), which it incorrectly asserts complies with OMB Circular A-4, and applies them inconsistently. Circular A-4 suggests that utilizing discount rates of 3 and 7 percent is likely appropriate, at minimum and in general. However, regarding costs and benefits that arise across generations—the type of intergenerational discounting at play in

<sup>96</sup> Based on emissions reported in the RIA for this proposal and the domestic and global SC-CH<sub>4</sub> as included in U.S. EPA (2018). Benefits and Tables OOOOa Reconsideration.

<https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2017-0483-0082&attachmentNumber=1&contentType=excel12book>.

<sup>97</sup> U.S. EPA (2018). Benefits and Tables OOOOa Reconsideration. Tab “Option 3”

<https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2017-0483-0082&attachmentNumber=1&contentType=excel12book> At Tab “Option 3”. All data taken directly from the 2018 RIA supporting data.

<sup>98</sup> This does not include potentially significant additional costs that were not quantified, as described below.

<sup>99</sup> RIA, p. 3.13.

analysis and consideration of climate impacts—Circular A-4 suggests that discount rates ranging from 1 to 3 percent are more appropriate.<sup>100</sup> U.S. EPA's choice to examine discount rates of only 3 and 7 percent is also contrary to IWG recommendations, which utilize 2.5, 3, and 5 percent discount rates.<sup>101</sup>

The SC-CH<sub>4</sub> is highly sensitive to discount rates. Higher discount rates decrease the value today of future environmental damages. The analysis should follow the IWG SC-CO<sub>2</sub> and present results for the three discount rates of 2.5, 3, and 5 percent to represent varying valuation of future damages. These rates are based on peer-reviewed expert input. The value today of environmental damages in the future is higher under the 2.5 discount rates compared to the 3 or 5 percent rates, reflecting the trade-off of consumption today and future damages. The IWG estimates and presents results for the SC-CO<sub>2</sub> across the 2.5, 3, and 5 percent discount rates that encompass a variety of assumptions regarding the correlation between climate damages and consumption of goods and are consistent with Circular A-4.

Further, the 3 and 7 percent estimates included in OMB Circular A-4 represent the before-tax rate of return to private capital and are not appropriate as the central estimates for an intergenerational valuation of the willingness-to-pay to avoid environmental damages, as the SC-CH<sub>4</sub> represents. The SC-CH<sub>4</sub> does not represent a 'private return to capital' and therefore the application of the 3 and 7 percent discount rates alone is inappropriate.

The 3 and 7 percent discount rates are also not in line with scientific or economic consensus. In a forthcoming peer-reviewed report, researchers surveyed 197 experts on the long-term social discount rates.<sup>102</sup> While there was much variation, the median preferred social discount rate is 2 percent, and 92 percent of experts surveyed preferred a social discount rate between 1 and 3 percent, lower than the lower of the two discount rates that U.S. EPA's analysis applies.<sup>103</sup>

In inaccurately purporting to follow the directive of Circular A-4 by applying the 3 and 7 percent discount rates, U.S. EPA's analysis does not even apply these two discount rates consistently. At least four tables provided in the proposal and RIA apply only the

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<sup>100</sup> OMB Circular A-4.

<sup>101</sup> IWG Addendum. U.S. EPA acknowledges some of the arguments for applying a 2.5 percent discount rate in an appendix to the RIA, but does not include the 2.5 percent discount rate in its analysis. RIA, p. A-7.

<sup>102</sup> Drupp, Moritz, et al., Discounting Disentangled, *American Economic Journal: Economic Policy*, 10 (4): 109-34, 2018, available at <https://www.aeaweb.org/articles?id=10.1257/pol.20160240&&from=f>.

<sup>103</sup> Drupp, Moritz, et al., Discounting Disentangled, *American Economic Journal: Economic Policy*, 10 (4): 109-34, 2018, available at <https://www.aeaweb.org/articles?id=10.1257/pol.20160240&&from=f>.

7 percent discount rate and omit the 3 percent discount rate without explanation or justification.<sup>104</sup>

**F. Potential updates to the best available science all point towards a higher, not lower, social cost of carbon**

It is critical to update estimates of climate damages as the science and economic understanding of climate change and its impact improve over time. There is an active discussion within government and academia about the role of SC-GHGs in assessing regulations, quantifying avoided climate damages, and the values themselves.

Recent peer-reviewed research suggests that the IWG SC-GHG estimates on sector-specific impacts may be too low as economic and scientific modeling have progressed over time and new data has been incorporated into IAMs. A 2017 report published in *Nature Communications* presented new damage functions based on current scientific literature and estimate that the agricultural impacts as estimated in the IWG SC-CO<sub>2</sub> are too low.<sup>105</sup> The report finds that the impacts in the agricultural sector increase from a net benefit of \$2.7 a tonne under the IWG SC-CO<sub>2</sub> to a net cost of \$8.50 per tonne using the latest available science. This update alone of the agricultural impacts would cause the total IWG SC-CO<sub>2</sub> to more than double.

A 2018 working paper from the University of Chicago used subnational data from 41 countries to improve the estimation of mortality impacts due within the IWG SC-CO<sub>2</sub>. The updated median willingness-to-pay to avoid excess mortality from warming could increase the IWG SC-CO<sub>2</sub> by up to \$39 per tonne.<sup>106</sup> These recent findings point to the IWG SC-GHG estimates as too low and that an updated estimate based on peer-reviewed science would be higher than the IWG values.

**V. U.S. EPA failed to quantify other costs of the Proposed Rule**

Besides the adverse climate impacts described above, U.S. EPA fails to quantify multiple harms that represent significant costs to individuals, private businesses, and government agencies in the United States. By relaxing NSPS requirements, the Proposal would result in financial savings to industry at the expense of increased emissions of methane, VOCs, and hazardous air pollutants (HAP).<sup>107</sup> These emissions

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<sup>104</sup> 84 Fed. Reg. at 50,280–81, Tables 10 and 11; RIA, Tables 2-11 and 2-13.

<sup>105</sup> Moore, Frances, et al., *New Science of Climate Change Impacts on Agriculture Implies Higher Social Cost of Carbon*, *Nature Communications*, Volume 8, Article number 1607, 2017, available at <https://www.nature.com/articles/s41467-017-01792-x>.

<sup>106</sup> Carleton, Tamma, et al., *Valuing the Global Mortality Consequences of Climate Change Accounting for Adaptation Costs and Benefits*, August 2018, available at [https://bfi.uchicago.edu/sites/default/files/file\\_uploads/WP\\_2018-51\\_0.pdf](https://bfi.uchicago.edu/sites/default/files/file_uploads/WP_2018-51_0.pdf).

<sup>107</sup> RIA.

increases result in health, environmental, and welfare harms that represent new costs to individuals, businesses, and government agencies in the United States. The RIA for the Proposed Rule identifies and quantifies all financial benefits to the oil and natural gas industry, but does not quantify the harms associated with emissions increases. These costs, if quantified, could easily outweigh the benefits described in the Proposed Amendments RIA. Their exclusion creates a biased analysis.

In particular, the costs associated with adverse health and environmental outcomes due to increased emissions and exposures to VOCs, HAPs, particulate matter (PM), and ozone are omitted. The Proposed Rule, if finalized, would cause a significant increase in VOC emissions, which are a precursor to both ozone and secondary particulate matter. In addition, the proposal would increase emissions of HAPs. These emissions increases could adversely impact the health of individuals and increase occupational exposure for workers, likely resulting in significant costs. These costs may be borne in various ways throughout society including by individuals, private businesses, private health insurance, or public funding of health programs.

U.S. EPA's attempt to justify its failure to quantify non-climate impacts, by citing uncertainty about the location of future emission sources and the difficulty in modeling local air quality, is unpersuasive. Some amount of uncertainty in forward-looking analyses always exists. To be compliant with the laws, Executive Orders, and policies described above, however, RIAs must address that uncertainty through the various quantitative methods available, especially where it concerns increased costs and adverse impacts on public health. A health impact analysis for PM and ozone is longstanding practice at U.S. EPA, and the methods are well established. For example, another recent U.S. EPA RIA performed a similar analysis and found that rolling back existing regulatory protections would increase emissions that would cause thousands of premature deaths and other health impacts across the United States, resulting in billions of dollars of increased costs to individuals, businesses, and society.<sup>108</sup>

The costs associated with the health impacts caused by the Proposed Rule are likely significant. VOCs serve as precursors to the formation of fine particulate matter, particles small enough to penetrate the lungs. In addition to reducing visibility, fine particulate matter worsens acute and chronic respiratory ailments, including asthma.<sup>109</sup> Other health effects of these emissions include increased asthma emergency room

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<sup>108</sup> Regulatory Impact Analysis for the Proposed Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guideline Implementing Regulations; Revisions to New Source Review Program, Aug. 2018, Docket ID No. EPA-HQ-OAR-2017-0355-21182.

<sup>109</sup> U.S. Environmental Protection Agency (2009) Integrated Science Assessment for Particulate Matter Final Report [http://www.epa.gov/ncea/pdfs/partmatt/Dec2009/PM\\_ISA\\_full.pdf](http://www.epa.gov/ncea/pdfs/partmatt/Dec2009/PM_ISA_full.pdf).

visits, hospital admissions for cardiopulmonary causes,<sup>110</sup> and premature death in adults.<sup>111, 112</sup> VOCs and methane (the main component of natural gas) are also precursors to the formation of ground-level ozone (smog), which contributes to asthma and other respiratory problems, and particularly impacts children and outdoor workers.<sup>113, 114</sup> Typical valuations for morbidity and mortality used by U.S. EPA can be found in Table 5-9 of the RIA for the 2012 PM National Ambient Air Quality Standards (NAAQS) revisions.<sup>115</sup> For each mortality, U.S. EPA estimates the value of a statistical life to be \$9.6 million dollars, and twelve other health outcomes valued by U.S. EPA vary from \$68 to \$200,000 per incidence.<sup>116</sup> Even minimal impacts on public health because of the proposal could easily offset any benefits to businesses, and an analysis of these impacts is necessary.

There are multiple metrics that U.S. EPA commonly uses to investigate the potential range of health impacts and the resulting costs from its proposed actions, and which U.S. EPA can and should use here. Circular A-4 describes multiple approaches to bound the potential impacts of a regulation where there is uncertainty in one or more outcomes.<sup>117</sup> U.S. EPA should apply these approaches to its current proposal to understand better the potential value of health impacts and the costs to individuals and society.

Additionally, U.S. EPA experts in the Office of Air Quality Planning and Standards published a paper on this very topic in July 2018.<sup>118</sup> U.S. EPA alleges that this study “does not yet supply the information needed to derive a VOC benefit per ton value suitable for a regulatory analysis.”<sup>119</sup> However, the study, entitled “Assessing Human Health PM<sub>2.5</sub> and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025,” expressly quantifies the impacts of oil and natural gas emissions, applying a

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<sup>110</sup> Bell ML, Ebisu K, Peng R D, Samet J M, Zeger S L, Dominici F. 2008. Seasonal and regional short-term effects of fine particles on hospital admissions in 202 US Counties 1999-2005 *Am J Epidemiol.* 168(11): 1301–10.

<sup>111</sup> Brook, R.D. et al. (2010) “Particulate matter air pollution and cardiovascular disease-an update to the scientific statement from the American Heart Association” *Circulation*, 121:2331-2378.

<sup>112</sup> Krewski, D. et al. (2009) “Extended follow-up and spatial analysis of the American Cancer Society Study linking particulate air pollution and mortality” Health Effects Institute Research Report Number 140.

<sup>113</sup> U.S. Environmental Protection Agency (2006) Air Quality Criteria for Ozone and Related Photochemical Oxidants (Final Report) <http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=149923>

<sup>114</sup> U. S. Environmental Protection Agency (2013) Integrated Science Assessment for Ozone and Related Photochemical Oxidants (Final Report) <http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=247492>

<sup>115</sup> Regulatory Impact Analysis for the Final Revisions to the National Ambient Air Quality Standards for Particulate Matter, Dec. 2012 (Revised Feb. 28, 2013), Docket ID No. EPA-HQ-OAR-2007-0492-10094.

<sup>116</sup> Regulatory Impact Analysis for the Final Revisions to the National Ambient Air Quality Standards for Particulate Matter, Dec. 2012, at Table 5-9.

<sup>117</sup> *E.g.*, OMB Circular A-4, p. 38.

<sup>118</sup> Fann, Neal, et al., Assessing Human Health PM<sub>2.5</sub> and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025, *Environ. Sci. Technol.* 2018, 52, 8095–8103, July 13, 2018.

<sup>119</sup> 84 Fed. Reg. at 50,279.

benefit-per-ton approach that is well established and has been widely used.<sup>120</sup> Rather than this approach, U.S. EPA writes, “to the extent that EPA were to quantify these ozone and PM impacts, it would estimate the number and value of avoided premature deaths and illnesses using an approach detailed in the Particulate Matter NAAQS and Ozone NAAQS Regulatory Impact Analyses.”<sup>121</sup> Despite identifying a viable approach, U.S. EPA still declines to estimate the adverse impacts of its Proposed Rule, asserting simply, “[W]e are unable to quantify these effects at this time.”<sup>122</sup> By refusing to estimate the costs of its Proposed Rule to human health, when the ability to estimate those costs has already been well demonstrated by its own experts, U.S. EPA refuses to consider an important aspect of the problem in violation of the CAA.

Similarly, RIA Table 3-1 attempts to rationalize U.S. EPA’s failure to quantify any costs of its Proposed Rule besides the “interim domestic cost of methane.”<sup>123</sup> For most of the adverse impacts that the agency failed to quantify, U.S. EPA blames “data limitations,” despite acknowledging that it has quantified the same impacts in other analyses.<sup>124</sup> CARB disagrees that data limitations could prevent U.S. EPA from estimating the impacts of its Proposal, given that the RIA provides estimates of the anticipated emissions increases, and the methodology of U.S. EPA’s own experts can readily be applied to these emissions to yield estimates for these endpoints.<sup>125</sup>

U.S. EPA not only fails to quantify the impacts of, but fails even to estimate and consider, methane’s role as a precursor for ozone and its impact on achieving ozone NAAQS. Methane emissions contribute to global background ozone concentrations.<sup>126</sup> Mitigating methane emissions can reduce ozone concentrations globally. One study calculated that anthropogenic methane emissions contributed about 4 ppb to surface ozone globally in 2030 under the baseline growth scenario.<sup>127</sup> In nitrogen oxides saturated environment such as Southern California, the surface ozone sensitivity to methane emissions can be twice the global mean. Another study estimated that reducing 50% of anthropogenic methane emissions globally reduced summer afternoon surface ozone concentrations by three parts per billion (ppb) over the US (based on model year 1995) and nearly halves the incidence of US high ozone events

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<sup>120</sup> Fann, Neal, et al., Assessing Human Health PM2.5 and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025, *Environ. Sci. Technol.* 2018, 52, 8095–8103, July 13, 2018.

<sup>121</sup> RIA, p. 3-2

<sup>122</sup> RIA, p. 3-2

<sup>123</sup> RIA, p. 3-3 et seq.

<sup>124</sup> RIA, p. 3-5.

<sup>125</sup> Fann, Neal, et al., Assessing Human Health PM2.5 and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025, *Environ. Sci. Technol.* 2018, 52, 8095–8103, July 13, 2018.

<sup>126</sup> West, J.J., Fiore, A.M., 2005, Management of tropospheric ozone by reducing methane emissions, *Environmental Science & Technology*, 39, 4685-4691.

<sup>127</sup> Fiore, A.M., West, J.J., Horowitz, L.W., Naik, V., Schwarzkopf, M.D. 2008, Characterizing the tropospheric ozone response to methane emission controls and the benefits to climate and air quality, *Journal of Geophysical Research*, 113, D08307, doi:10.1029/2007JD009162.

(i.e., defined as afternoon ozone concentrations greater than 70 ppb).<sup>128</sup> Another study estimated that reducing 20 percent of current global anthropogenic methane emissions will reduce ozone concentrations globally by 1 ppb.<sup>129</sup> Given the impact of methane emissions on global ozone concentrations, mitigating methane emissions can have significant global health benefits. For example, a study estimated that reducing 20 percent of current global anthropogenic methane emissions prevents 30,000 premature mortalities globally in 2030 and 370,000 cumulative mortalities between 2010 and 2030.<sup>130</sup> In 2017, Sarofim et al. estimated that 1 million metric ton decrease in methane emissions leads to 10–20 avoided mortality in the US and 200–300 avoided mortality globally on an annual basis.<sup>131</sup>

As global background ozone concentrations increase, meeting national ambient ozone standards becomes more difficult.<sup>132</sup> The public will benefit from more coordinated efforts globally on methane emission controls. Mitigating methane emissions can reduce ozone concentrations everywhere, which differs from other means of controlling emissions that have primarily local or regional impacts. US regulation on methane emissions will spur technological innovation and lead regulatory efforts in other countries. Global implementation of methane emission reductions will reduce global background ozone concentrations, achieve significant health benefits in the US and globally, and make it easier to achieve the national ambient ozone standards in the US.

Besides health impacts, there likely would be additional costs resulting from the Proposal that have not been quantified or monetized. These include adverse outcomes such as impacts to ecosystems, vegetation, and visibility.

The RIA for the Proposed Rule also does not quantify the governmental costs that result from the proposal. As a part of the Clean Air Act, the U.S. EPA sets NAAQS to protect public health. Many urban regions across the United States are in nonattainment for federal ozone and particulate matter NAAQS, meaning pollution levels are above limits the federal government deems safe, and states must implement

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<sup>128</sup> Fiore, A.M., Jacob, D.J., Field, B.D., Streets, D.G., Fernandes, S.D., Jang, C., 2002, Linking ozone pollution and climate change: the case for controlling methane, *Geophysical Research Letters*, 29, 1919, doi:10.1029/2002GL015601.

<sup>129</sup> West, J.J., Fiore, A.M., Horowitz, L.W., Mauzerall, D.L., 2006, Global health benefits of mitigating ozone pollution with methane emission controls, *Proceedings of the National Academy of Sciences of the United States of America*, 103, 3988–93.

<sup>130</sup> West, J.J., Fiore, A.M., Horowitz, L.W., Mauzerall, D.L., 2006, Global health benefits of mitigating ozone pollution with methane emission controls, *Proceedings of the National Academy of Sciences of the United States of America*, 103, 3988–93.

<sup>131</sup> Sarofim, M.C., Waldhoff, S.T., Anenberg, S.C., 2017, Valuing the ozone-related health benefits of methane emission controls, *Environmental Resource Economics*, 66, 45–63.

<sup>132</sup> West, J.J., Fiore, A.M., Horowitz, L.W., Mauzerall, D.L., 2006, Global health benefits of mitigating ozone pollution with methane emission controls, *Proceedings of the National Academy of Sciences of the United States of America*, 103, 3988–93.

programs, incentives, or regulations to reduce emissions. An increase in VOC emissions can increase ozone and particulate matter concentrations, which may make it more difficult for states to meet the federal standards. This may result in the need for states to develop new programs to address these emissions impacts. This would create new costs to plan, promulgate, implement, and enforce additional regulations, programs, and/or incentives that were not included in the RIA.

#### **A. U.S. EPA failed to model emissions increases**

While U.S. EPA acknowledges that the emissions increases resulting from its proposal “may increase ozone formation, human exposure to ozone, and the incidence of ozone related health effects[,]” the agency declined to quantify related costs due to “complexity” and “uncertainty,” and declined to perform air quality modeling that would quantify the ozone-related costs due to “data limitations.”<sup>133</sup> Without such modeling, however, U.S. EPA claims, “we are unable to estimate the effect” of the proposal’s VOC emissions impacts on ambient ozone concentrations.<sup>134</sup> The agency makes the same claims about its decision not to estimate or model visibility impacts.<sup>135</sup>

However, U.S. EPA conducts large-scale modeling studies for the continental U.S. on a regular basis, and these studies can be designed to provide the type of information needed to assess the impact of increases in VOC emissions on ozone (and PM<sub>2.5</sub>) on a region-specific basis, while accounting for the complex non-linear chemistry of ozone formation. If U.S. EPA has resources to conduct multi-decadal coupled meteorology-air quality model simulations,<sup>136</sup> then they certainly have the resources needed to conduct a single model simulation with Direct Decoupled Method (DDM) analysis<sup>137</sup> to assess the ozone response to changes in VOC emissions. U.S. EPA does have the resources, expertise, and ability to conduct modeling to assess these impacts, but has chosen not to.

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<sup>133</sup> RIA at p. 3-15.

<sup>134</sup> RIA at p. 3-15.

<sup>135</sup> RIA at p. 3-19.

<sup>136</sup> E.g., Mathur, R., J. Xing, S. Napelenok, J. Pleim, C. Hogrefe, D. Wong, C.-M. Gan, and D. Kang (2016) Multiscale Modeling of Multi-decadal Trends in Ozone and Precursor Species Across the Northern Hemisphere and the United States. In: Steyn D., Chaumerliac N. (eds) Air Pollution Modeling and its Application XXIV. Springer Proceedings in Complexity. Springer, Cham.

<sup>137</sup> E.g., Napelenok, S. L., K. M. Foley, D. Kang, R. Mathur, T. Pierce, and S. T. Rao (2011) Dynamic evaluation of regional air quality model’s response to emission reductions in the presence of uncertain emission inventories, 45 (24), 4091–98. <https://doi.org/10.1016/j.atmosenv.2011.03.030>

## **B. The RIA fails to analyze impacts on “sub-populations of particular concern”**

Circular A-4 states that RIAs should describe how “both benefits and costs are distributed among sub-populations of particular concern.”<sup>138</sup> Without quantifying the adverse health and environmental impacts likely to result from the Proposed Rule, it is not possible to describe their distributional impacts. The Proposed Rule will likely impact a number of sub-populations of particular concern. Air pollution is known to affect disproportionately multiple groups including children, elderly, those with pre-existing cardiopulmonary diseases, and those with low socioeconomic standing.<sup>139</sup> As such, emissions increases may disproportionately harm these groups—but U.S. EPA failed to undertake this analysis.

### **1. Impacts on Children**

E.O. 13045 and Circular A-4 require additional analyses in the case that a regulation could produce environmental health risks that disproportionately impact children.<sup>140</sup> E.O. 13045 requires Federal agencies to “make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children.”<sup>141</sup> In addition, E.O. 13045 requires each regulatory action to evaluate the environmental health or safety effects on children, and explain why the proposal is preferable to other potentially effective and reasonably feasible alternatives.<sup>142</sup>

U.S. EPA claims that the proposed action is not subject to E.O. 13045 because the Proposed Rule is “not economically significant as defined in Executive Order 12866.”<sup>143</sup> However, E.O. 13045 applies to proposed actions that are not economically significant but that would have adverse material effects on the environment, public health, or governments or communities.<sup>144</sup> U.S. EPA was therefore required to evaluate the potential impacts on children, and did not.

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<sup>138</sup> OMB Circular A-4.

<sup>139</sup> *E.g.*, U.S. EPA, Integrated Science Assessment for Particulate Matter, EPA/600/R-08/139F, 2009, available at <https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=216546>.

<sup>140</sup> OMB Circular A-4, p. 44; E.O. 13045, April 21, 1997.

<sup>141</sup> E.O. 13045, April 21, 1997.

<sup>142</sup> E.O. 13045, April 21, 1997.

<sup>143</sup> 84 Fed. Reg. at 50,282.

<sup>144</sup> E.O. 13045 applies to “any substantive action in a rulemaking . . . that is likely to result in a rule that may: (a) be ‘economically significant’ under Executive Order 12866 (a rulemaking that has an annual effect on the economy of \$100 million or more or would adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities); and (b) concern an environmental health risk or safety risk that an agency has reason to believe may disproportionately affect children.” E.O. 13045, April 21, 1997, sec. 2-202 (emphases added).

Additionally, U.S. EPA suggests that children will continue to be adequately protected by “applicable local, state, or federal permitting or air quality management programs that will continue to address areas with degraded air quality and maintain the air quality in areas meeting current standards,”<sup>145</sup> ignoring both the impact of increased VOC and methane emissions on areas in non-attainment with NAAQS and U.S. EPA’s many concurrent efforts to undermine and avoid its other regulatory obligations.<sup>146</sup> The Proposed Rule have the potential to cause environmental harm that disproportionately impacts children, and U.S. EPA has not met its obligation to analyze these impacts.

## 2. Environmental Justice Impacts

E.O. 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, requires additional analyses in the case that a regulation could produce environmental health risks with environmental justice impacts.<sup>147</sup> E.O. 12898 requires agencies to evaluate proposed actions for “disproportionately high and adverse human health or environmental effects on minority populations, low-income populations and/or indigenous peoples.”<sup>148</sup> Additionally, § 601 of Title VI of the Civil Rights Act of 1964 prohibits discrimination under covered programs and activities.<sup>149</sup>

U.S. EPA proffers its “belief,” but no evidence, that the Proposal is unlikely to impose disproportionate risk on minority populations, low-income populations, and/or indigenous peoples.<sup>150</sup>

Additionally, U.S. EPA claims that these populations will continue to be adequately protected by “existing NAAQS and other mechanisms in the CAA,”<sup>151</sup> ignoring both the impact of increased methane and VOC emissions on areas in non-attainment with NAAQS and U.S. EPA’s many concurrent efforts to undermine and avoid its other

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<sup>145</sup> 84 Fed. Reg. at 50,282.

<sup>146</sup> *E.g.*, “Proposed Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks,” 83 Fed. Reg. 42,986 (Aug. 24, 2018); “Call for Information on Adverse Effects of Strategies for Attainment and Maintenance of National Ambient Air Quality Standards,” 83 Fed. Reg. 29,784 (June 26, 2018); Guidance Memorandum, “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act,” 83 Fed. Reg. 5,543 (Feb. 8, 2018); “Proposed Repeal of Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units,” 82 Fed. Reg. 48,035 (Oct. 16, 2017).

<sup>147</sup> E.O. 12898, Feb. 11, 1994.

<sup>148</sup> E.O. 12898, Feb. 11, 1994.

<sup>149</sup> *But see Alexander v. Sandoval*, 532 U.S. 275 (2001) (private right of action to enforce § 601 is limited to intentional discrimination).

<sup>150</sup> 84 Fed. Reg. at 50283.

<sup>151</sup> 84 Fed. Reg. at 50283.

regulatory obligations.<sup>152</sup> The Proposed Rule has the potential to cause environmental harm that disproportionately impacts environmental justice communities, and U.S. EPA must perform an analysis of these impacts.

### C. Time Horizon

The time horizon for the economic analysis is a mere 6 years (2019-2025).<sup>153</sup> This may not fully capture the harms of the proposed regulation, which increase over time. The RIA for the proposed amendments shows that emissions of methane, VOCs, and HAPs increase linearly over the analysis period,<sup>154</sup> and this presumably would continue into future years (increasing the overall costs of the amendments).

The RIA for the Proposed Rule states that while “it is desirable to analyze impacts beyond 2025,” uncertainty precludes this analysis.<sup>155</sup> This argument is not compelling, as a sensitivity of potential impacts could be bounded using various assumptions. Uncertainty in future impacts is routinely projected using likely low to high range, or likely scenarios, of input variables. A well-known example of this approach is used in projecting future global temperature change in Intergovernmental Panel on Climate Change reports.<sup>156</sup>

Additionally, U.S. EPA begins its cost analysis in 2019, although the comment deadline on the Proposed Rule is not until November 25, 2019, and the proposal is unlikely to be finalized for at least several months thereafter. Given the short six-year regulatory horizon considered in the RIA, using an inaccurate timeline further diminishes the information provided to the public regarding future impacts of the Proposal. This may also distort the analysis from a cost-benefit analysis perspective, to the extent that the relative magnitudes of cost and benefits vary over time.

### D. Labor Impacts

Rather than providing an informative analysis of potential labor and employment impacts as part of its RIA, U.S. EPA asserts that vaguely defined uncertainties prevent

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<sup>152</sup> *E.g.*, “Proposed Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks,” 83 Fed. Reg. 42,986 (Aug. 24, 2018); “Call for Information on Adverse Effects of Strategies for Attainment and Maintenance of National Ambient Air Quality Standards,” 83 Fed. Reg. 29,784 (June 26, 2018); Guidance Memorandum, “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act,” 83 Fed. Reg. 5,543 (Feb. 8, 2018); “Proposed Repeal of Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units,” 82 Fed. Reg. 48,035 (Oct. 16, 2017).

<sup>153</sup> RIA at 2-21.

<sup>154</sup> RIA at Table 2-3.

<sup>155</sup> RIA at 5-12.

<sup>156</sup> *E.g.*, IPCC, Special Report on Global Warming of 1.5°C, 2018, figure SPM.1(a), available at [https://report.ipcc.ch/sr15/pdf/sr15\\_spm\\_final.pdf](https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf).

any quantitative assessment of the employment impacts. An appropriate RIA must address that uncertainty through the various quantitative methods available, especially where it concerns potential employment impacts.

The RIA for the OOOOa NSPS included a quantitative partial employment analysis, finding that the one-time labor requirement for the affected sector to be about 270 full-time equivalents (FTE) in 2020 and 2025, and the annual labor requirement was estimated to be about 1,100 FTEs in 2020 and 1,800 FTEs in 2025.<sup>157</sup> One approach EPA could have used is to compare the Proposed Rule to the 2016 NSPS OOOOa and made a quantitative estimate of how these estimated FTEs may change as a result of this proposal.

## VI. The Proposed Rule violates Clean Air Act section 307(d)

Clean Air Act section 307(d) lays out procedural requirements for most rulemaking under the Act, including New Source Performance Standards.<sup>158</sup> It requires that a Notice of Proposed Rulemaking be “accompanied by a statement of its basis and purpose.”<sup>159</sup> This must include:

[A] summary of (A) the factual data on which the proposed rule is based; (B) the methodology used in obtaining the data and in analyzing the data; and (C) the major legal interpretations and policy considerations underlying the proposed rule . . . . All data, information, and documents referred to in this paragraph on which the proposed rule relies shall be included in the docket on the date of publication of the proposed rule.<sup>160</sup>

The Notice of Proposed Rulemaking fails to meet these standards in several respects. U.S. EPA solicits data that *would* support amendments, presently unjustified, that the agency is already proposing<sup>161</sup>; and rejects its own data, analyses, and duly-promulgated NSPS because of vague “uncertainties”.<sup>162</sup> Additionally, as noted above, U.S. EPA possesses an immense amount of directly-relevant data provided by the regulated facilities themselves, as a consequence of the NSPS and related ICR.<sup>163</sup> Strikingly, U.S. EPA scarcely references any of this compliance data, and does not place any of the reports in the docket.

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<sup>157</sup> RIA at p. 4-6.

<sup>158</sup> 42 U.S.C. § 7607(d)(1)(A)(C).

<sup>159</sup> 42 U.S.C. § 7607(d)(3).

<sup>160</sup> 42 U.S.C. § 7607(d)(3).

<sup>161</sup> *E.g.*, 84 Fed. Reg. at 50,273–74.

<sup>162</sup> *E.g.*, 84 Fed. Reg. at 50,273–74.

<sup>163</sup> 81 Fed. Reg. 35,824 (June 3, 2016); U.S. EPA ICR 2523.01c, RIN 2060-AS30, available at [https://www.reginfo.gov/public/do/PRAViewDocument?ref\\_nbr=201807-2060-002](https://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=201807-2060-002).

The Regulatory Impact Analysis (RIA) for the Proposed Rule repeatedly violates the additional requirement of Clean Air Act section 307(d) that the statement of basis and purpose “set forth or summarize and provide a reference to any pertinent findings, recommendations, and comments by . . . the National Academy of Sciences, and, if the proposal differs in any important respect from any of these recommendations, an explanation of the reasons for such differences.”<sup>164</sup> In 2017, the National Academies of Sciences, Engineering, and Medicine released a report examining potential approaches for a comprehensive update to the methodology for estimating the social cost of GHGs to ensure resulting cost estimates reflect the best available science.<sup>165</sup> The report makes several “pertinent findings, recommendations, and comments” with which the RIA for the Proposed Rule fails to engage.

As discussed above, the Proposed Rule relies on U.S. EPA’s outcome-seeking application of an “interim domestic” social cost of methane (SC-CH<sub>4</sub>), rather than the global value traditionally employed, to minimize the monetized costs of the increased methane emissions that would result from the Proposal. The National Academies report notes that domestic-only values for the social costs of GHGs have not been adequately researched and are not yet appropriate for application: “Estimation of the net damages per ton of [GHG] emissions to the United States alone, beyond the approximations done by the [Interagency Working Group], is feasible in principle; however it is limited by the existing [Social Cost-Integrated Assessment Model] methodologies, which focus primarily on global estimates and do not model all relevant interactions among regions.”<sup>166</sup> U.S. EPA merely acknowledges the National Academies’ caveat,<sup>167</sup> which does not meet the statutory requirement to, “if the proposal differs in any important respect from any of these recommendations, [provide] an explanation of the reasons for such differences.”<sup>168</sup>

## **VII. U.S. EPA cannot require pollutant-specific significant contribution findings for an already listed source category**

U.S. EPA should not upend its long-standing, well-reasoned interpretation to require pollutant-specific significant contribution findings for additional pollutants from a source category. Section 111(b) of the Clean Air Act is clear and unambiguous: U.S. EPA must include a category of stationary sources if that *source* “causes, or contributes significantly to, air pollution.”<sup>169</sup> Nothing in that requirement suggests that

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<sup>164</sup> 42 U.S.C. § 7607(d)(3).

<sup>165</sup> National Academies of Science, Engineering, and Medicine, *Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide*, 2017, *available at* <http://www.nap.edu/24651> (“National Academies”).

<sup>166</sup> National Academies at 12.

<sup>167</sup> RIA at 3-14.

<sup>168</sup> 42 U.S.C. § 7607(d)(3).

<sup>169</sup> 42 U.S.C. § 7411(b)(1)(A).

a source could be in the list with respect to some pollutants, but not in the list with respect to other pollutants—indeed, section 111 contemplates a single “list” of categories of stationary sources.<sup>170</sup>

Once a category of stationary sources is added to the section 111 list, U.S. EPA must promulgate regulations establishing standards of performance for new (section 111(b)) and existing (section 111(d)) sources. Section 111 defines “standard of performance”<sup>171</sup> and in doing so, does not permit U.S. EPA to make any sort of “pollutant-specific significant contribution finding” nor exclude sources with respect to pollutants based on any such finding. Once a category of sources is identified, U.S. EPA has the power and obligation to regulate all air emissions from those sources, within the limitations set forth in section 111 for standards of performance and the need to demonstrate a rational basis for those regulations. This power and obligation extends to pollutants only later discovered to be problematic. And despite U.S. EPA’s implication in its Proposed Rule that it was unaware of the harm of greenhouse gases in the 1970s (when it first listed the source categories at issue here), by the 1970s the potential harm of greenhouse gases was well known to the scientific community.<sup>172</sup>

Furthermore, U.S. EPA is well aware of this distinction between listing a category and imposing standards of performance for sources that fall within already listed categories. Indeed, U.S. EPA practice is typically to list source categories without first making specific “contribute significantly” findings for specific pollutants.<sup>173</sup> It is disingenuous for U.S. EPA to claim ignorance of this history by pointing to a 1977 guideline document that did not undergo the thorough public scrutiny required for regulations.<sup>174</sup> Nor is it convincing when U.S. EPA quotes a House Conference Committee Report summarizing the 1977 Clean Air Act amendments: “In all future rulemaking in these areas, the Administrator could regulate any air pollutant from those sources, the emissions of which ‘in his judgment cause or contribute to air pollution . . . .’”<sup>175</sup> Beside the fact that a single legislative report cannot overcome the plain meaning of the statute, U.S. EPA ignores the plain meaning of the quote in question. The phrase “the emissions of which” modifies the word “sources,” not “air pollutant,” and so the quotation at issue is properly read to mean: “the Administrator could regulate any air pollutant from those sources, the emissions of a source that ‘in his judgment cause or contribute to air pollution . . . .’” In other words, this Committee

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<sup>170</sup> 42 U.S.C. § 7411(b).

<sup>171</sup> 42 U.S.C. § 7411(a)(1).

<sup>172</sup> See, e.g., Danny Lewis, *Scientists have been talking about greenhouse gases for 191 years*, SMITHSONIAN.COM (Aug. 3, 2015), available at <https://www.smithsonianmag.com/smart-news/scientists-talking-about-greenhouse-gases-191-years-180956146/>.

<sup>173</sup> See List of Categories of Stationary Sources, 36 Fed. Reg. 5,931 (Mar. 31, 1971); Priority List and Additions to the List of Categories of Stationary Sources, 44 Fed. Reg. 49,222 (Aug. 21, 1979).

<sup>174</sup> Proposed Rule at 50,266.

<sup>175</sup> Proposed Rule at 50,264 (quoting H.R. Rep. No. 95-564, at 183–84 (1977)).

Report is at best ambiguous as to whether the source or the air pollutant must be the focus of the "cause or contribute" finding.

### **VIII. U.S. EPA should maintain its reporting requirements and ICR**

The NSPS and co-promulgated Information Collection Request (ICR) require sources to submit annual compliance reports to U.S. EPA, including reporting about regulated entities' compliance with the NSPS leak detection and repair requirements.<sup>176</sup> U.S. EPA assumes that omitting transmission and storage sources from the source category would rescind the reporting requirements and ICR, and does not provide justification for these proposed amendments. However, Clean Air Act section 114(a)(iii) authorizes reporting, monitoring, recordkeeping, and related requirements on any source or operator, that would help carry out any other non-vehicular provision of the Clean Air Act, regardless of whether those sources are listed under section 111.<sup>177</sup> Even if U.S. EPA finalizes its proposed removal of transmission and storage sources from the source category, it need not, and should not, repeal the reporting and recordkeeping requirements and ICR, which provide value to U.S. EPA, State, local, and Tribal regulators, and the public. Further, because removal of transmission and storage sources from the source category would not compel U.S. EPA to repeal the reporting and recordkeeping requirements and ICR for these sources, U.S. EPA must justify its proposal of these amendments, which it has failed to do.

### **Conclusion**

CARB reiterates its support of U.S. EPA's 2016 Oil and Gas New Source Performance Standards for New, Reconstructed, and Modified Sources, and cautions U.S. EPA that its proposal to rescind this standard is illegal, inappropriate, and contrary to its Clean Air Act obligations to protect public health and welfare.

Sincerely,



Richard W. Corey  
Executive Officer

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<sup>176</sup> 81 Fed. Reg. 35,824 (June 3, 2016); U.S. EPA ICR No. 2523.01c, RIN 2060-AS30, available at [https://www.reginfo.gov/public/do/PRAViewDocument?ref\\_nbr=201807-2060-002](https://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=201807-2060-002).

<sup>177</sup> 42 U.S.C. § 7414(a)(iii).

December 17, 2018

Andrew Wheeler  
U.S. Environmental Protection Agency  
Office of the Administrator  
1200 Pennsylvania Ave. NW, MC 28221T  
Washington, DC 20460

**Comments submitted electronically via <https://www.regulations.gov>**

**RE: Comments on Proposed “Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration,” 83 Fed. Reg. 52056, Docket Identification Number EPA-HQ-OAR-2017-0483**

Dear Acting Administrator Wheeler:

The California Air Resources Board (CARB) submits the enclosed comments on the Proposed “Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration.” CARB continues to support the United States Environmental Protection Agency’s (U.S. EPA) 2016 New Source Performance Standards (NSPS) for methane emissions in the oil and natural gas sector<sup>1</sup> and opposes U.S. EPA’s proposed amendments to the NSPS.

We strongly urge that U.S. EPA retain the current regulatory requirements, as they are consistent with the Agency’s statutory obligations, are well-supported by the record, and produce substantial benefits at limited cost. The Board agrees with U.S. EPA’s 2016 determination that full implementation of the NSPS is an important and necessary step to fulfill U.S. EPA’s duties to protect public health and the environment. CARB cautions U.S. EPA that its proposal to weaken this standard is arbitrary, illegal, inappropriate, and contrary to its Clean Air Act obligations to protect public health and welfare.

Sincerely,



Richard W. Corey  
Executive Officer

Enclosure: Comments of the California Air Resources Board on the Proposed “Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration,” 83 Fed. Reg. 52056 (Oct. 15, 2018).

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<sup>1</sup> Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources; Final Rule, 81 Fed. Reg. 35,824 (June 3, 2016), at 40 Code of Federal Regulations (CFR) part 60, subpart OOOOa.

## **Comments of the California Air Resources Board**

### **Responding to**

### **The United States Environmental Protection Agency**

### **Request for Comment on Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration: Proposed Amendments**

### **Docket No. EPA-HQ-OAR-2017-0483**

The California Air Resources Board (CARB)<sup>1</sup> submits the following comments on the United States Environmental Protection Agency (U.S. EPA), Notice of Proposed Rulemaking: "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration," 83 Fed. Reg. 52056, Docket Identification Number EPA-HQ-OAR-2017-0483 (hereafter "proposed amendments"). The substance and process of the proposed amendments disregard U.S. EPA's statutory obligations, endanger public health and the environment, and are arbitrary, capricious, and contrary to law.

California's Attorney General, along with several other jurisdictions' Attorneys General, will also be submitting comments opposing the proposed amendments. CARB agrees with the substance of those legal comments and focuses here primarily on the many technical problems with U.S. EPA's proposal. CARB previously submitted comments on U.S. EPA's notice of reconsideration and partial stay of the NSPS, proposed stays of NSPS compliance deadlines, and related Notices of Data Availability,<sup>2</sup> and incorporates those comments herein.

### **Introduction**

On June 3, 2016, U.S. EPA finalized its "Emission Standards for New, Reconstructed, and Modified Sources," 81 Fed. Reg. 35,824, at 40 Code of Federal Regulations (C.F.R.) part 60, subpart OOOOa (hereafter "New Source Performance Standards," or "NSPS"). The current NSPS is achievable, appropriate, and not in need of amendment, as California, other state and local regulators, and industrial actors are actively demonstrating.

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<sup>1</sup> CARB is the expert agency charged with overseeing all air pollution control efforts in California to attain and maintain health-based air quality standards. CARB's mission is to promote and protect public health, welfare, and ecological resources through effective reduction of air pollutants while recognizing and considering effects on the economy.

<sup>2</sup> See Docket ID No. EPA-HQ-OAR-2017-0346-0331, Aug. 9, 2017, commenting on 82 Fed. Reg. 25,730 (June 5, 2017); Docket ID No. EPA-HQ-OAR-2010-0505-12246, Aug. 9, 2017, commenting on 82 Fed. Reg. 27,641, 27,645 (June 16, 2017), and Docket ID No. EPA-HQ-OAR-2017-0346-0418, Dec. 8, 2017, commenting on 82 Fed. Reg. 51,794, 51,788 (Nov. 8, 2017).

The NSPS protects public health and the environment by reducing uncontrolled emissions of air pollutants, including toxic pollutants with carcinogenic and other health impacts; criteria pollutants that contribute to formation of smog and regional haze and endanger respiratory and cardiovascular health; and methane, a greenhouse gas (GHG) with approximately 86 times the heat-trapping power of carbon dioxide on a 20-year timeframe. The necessity of the methane reductions provided by the NSPS is underscored by the recent Fourth National Climate Assessment: Impacts, Risks, and Adaptation in the United States<sup>3</sup> and Intergovernmental Panel on Climate Change Special Report on Global Warming of 1.5 Degrees Celsius.<sup>4</sup>

The benefit provided by the NSPS significantly outweighs its limited and reasonable burden. The NSPS requirements are minimally costly, especially when viewed as a percentage of industry revenues or profits. They are consistent with actions that good industry operators are already taking, as all of the technologies or practices required in the NSPS are readily available and have been for years. Indeed, California's local air districts, like many regulators across the country, have been controlling volatile organic compounds (VOC) and other pollutants from the industry with these methods for decades. Industry is highly familiar with these approaches, has the necessary equipment, and can implement controls cost-effectively. Even with the implementation of these control measures over the years, California's oil and gas industry has flourished, with over 300 operators in the state, ranging from the very small "mom and pop" variety to large global companies. Methane-specific regulations like the NSPS build upon this long regulatory and industry experience.

State regulations demonstrate feasibility.

The feasibility and cost-effectiveness of California's Oil and Gas Regulation,<sup>5</sup> which is very similar to the NSPS, demonstrates that U.S. EPA and state governments can successfully regulate this sector and these emissions.<sup>6</sup> California's Oil and Gas Regulation went into effect on October 1, 2017, and is undergoing successful implementation with, for example, all 12 underground storage facilities in the state submitting their required underground storage facility monitoring plans<sup>7</sup> and about 650 facilities submitting equipment registrations to date.<sup>8</sup> Many of California's requirements

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<sup>3</sup> U.S. Global Change Research Program, Fourth National Climate Assessment, Vol. II: Impacts, Risks, and Adaptation in the United States: Overview, 2018, *available at* <https://nca2018.globalchange.gov>.

<sup>4</sup> Intergovernmental Panel on Climate Change (IPCC), Special Report on Global Warming of 1.5°C, 2018, *available at* <https://report.ipcc.ch/sr15/index.html>.

<sup>5</sup> Cal. Code Regs., tit. 17, §§ 95665-77.

<sup>6</sup> *Ibid.*

<sup>7</sup> *Id.* at § 95668(h)(2).

<sup>8</sup> *Id.* at § 95674(b)(2), requiring owners/operators of regulated facilities or equipment to register all of the covered equipment by reporting information to CARB or the local air district, including

are even more stringent than the NSPS. For example, California's Oil and Gas Regulation requires quarterly leak detection and repair (LDAR) inspections of all wells, regardless of production,<sup>9</sup> and quarterly inspections of wellhead-only well sites,<sup>10</sup> while the NSPS only requires semiannual inspections of well sites and exempts wellhead-only well sites from monitoring requirements.<sup>11</sup> However, strong national rules are needed to complement California's efforts. Approximately 90 percent of the natural gas consumed in California is imported from out-of-state, including from production on federal lands. The climate impacts of methane waste from out-of-state oil and gas operations are experienced by Californians, particularly the most vulnerable populations and communities.

Annual compliance reports also demonstrate that Leak Detection and Repair requirements are feasible.

The NSPS and co-promulgated Information Collection Request (ICR) require regulated entities to submit annual compliance reports to U.S. EPA, including reporting about regulated entities' compliance with the NSPS leak detection and repair requirements.<sup>12</sup> U.S. EPA has publicly released reports that represent only a small fraction of the facilities subject to the NSPS and ICR reporting requirements.<sup>13</sup> Despite this, a preliminary analysis of the released reports demonstrates that over 2,000 facilities reported meeting the NSPS LDAR requirements.<sup>14</sup> Like California and other jurisdictions' success in implementing similar or more rigorous regulations, this

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(a) the number of crude oil or natural gas wells; (b) identification of all pressure vessels, tanks, separators, sumps, and ponds at the facility, including the size of each tank and separator in units of barrels; (c) annual crude oil, natural gas, and produced water throughput; (d) identification of all reciprocating and centrifugal natural gas compressors; and (e) a count of all natural gas powered pneumatic devices and pumps.

<sup>9</sup> *Id.* at § 95669.

<sup>10</sup> *Ibid.*

<sup>11</sup> See 40 C.F.R. §§ 60.5397a(g); 60.5365a(i)(2).

<sup>12</sup> 81 Fed. Reg. 35,824 (June 3, 2016); U.S. EPA ICR No. 2523.01c, RIN 2060-AS30, available at [https://www.reginfo.gov/public/do/PRAViewDocument?ref\\_nbr=201807-2060-002](https://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=201807-2060-002).

<sup>13</sup> U.S. EPA made a small fraction of compliance reports publicly available in response to a Freedom of Information Act (5 U.S.C. § 552) request submitted by a number of jurisdictions, including California. See FOIA Online, FOIA Request EPA-HQ-2018-001886 Details, <https://www.foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-HQ-2018-001886&type=request>. A small number of reports that were submitted via U.S. EPA's Compliance and Emissions Data Reporting Interface are also available on U.S. EPA's public WebFIRE database. See also Letter from the State of California, CARB, et al., to Acting Administrator Wheeler (Nov. 19, 2018) (regarding a request for the remainder of the submitted compliance reports and a related extension of the deadline to comment on the proposed amendments).

<sup>14</sup> See FOIA Online, FOIA Request EPA-HQ-2018-001886 Details, <https://www.foiaonline.gov/foiaonline/action/public/submissionDetails?trackingNumber=EPA-HQ-2018-001886&type=request>.

widespread compliance undermines U.S. EPA's claims that NSPS compliance is infeasible or unduly burdensome.

**The proposed amendments violate Clean Air Act sections 111(b) and 307(d).**

U.S. EPA must demonstrate that any proposed amendments to the NSPS are consistent with Clean Air Act requirements. In particular, U.S. EPA must demonstrate that the standard or revision "reflects the degree of emission limitation achievable through the application of the best system of emission reduction," as required by Clean Air Act section 111(b).<sup>15</sup> U.S. EPA must also "consider the emission limitations and percent reductions achieved in practice."<sup>16</sup> U.S. EPA does not endeavor to explain how the proposed amended NSPS would meet either of these requirements – presumably because the proposed amendments do not. U.S. EPA bases its reconsideration and proposed amendments solely on the pursuit of cost savings for industry and ostensible cost-effectiveness of particular measures or emission reductions,<sup>17</sup> entirely ignoring its statutory mandate.

Clean Air Act section 307(d) lays out procedural requirements for most rulemaking under the Act, including New Source Performance Standards.<sup>18</sup> It requires that a Notice of Proposed Rulemaking be "accompanied by a statement of its basis and purpose."<sup>19</sup> This must include:

[A] summary of (A) the factual data on which the proposed rule is based; (B) the methodology used in obtaining the data and in analyzing the data; and (C) the major legal interpretations and policy considerations underlying the proposed rule . . . . All data, information, and documents referred to in this paragraph on which the proposed rule relies shall be included in the docket on the date of publication of the proposed rule.<sup>20</sup>

The Notice of Proposed Rulemaking fails to meet these standards in several respects. As discussed further in the technical comments below, U.S. EPA solicits data that *would* support amendments, presently unjustified, that the agency is already proposing<sup>21</sup>; rejects its own data, analyses, and duly-promulgated NSPS because of vague "uncertainties" and "potential overestimates"<sup>22</sup>; and solicits data that might allow the agency to finalize certain amendments, suggested by industry, that U.S. EPA would

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<sup>15</sup> 42 U.S.C. § 7411(a).

<sup>16</sup> *Id.* at § 7411(b)(1)(B).

<sup>17</sup> U.S. EPA's manipulation of its benefits quantification and resulting cost-effectiveness analysis are addressed below.

<sup>18</sup> 42 U.S.C. § 7607(d)(1)(A)(C).

<sup>19</sup> *Id.* at § 7607(d)(3).

<sup>20</sup> *Ibid.*

<sup>21</sup> *E.g.*, 83 Fed. Reg. at 52065-66;

<sup>22</sup> *E.g.*, *id.* at 52065-66, 52071.

prefer but lacked supporting data to propose.<sup>23</sup> Throughout, the document functions as an Advance Notice of Proposed Rulemaking<sup>24</sup> rather than a Notice of Proposed Rulemaking; it utterly flouts the requirements of Clean Air Act section 307(d).

Additionally, as noted above, U.S. EPA possesses an immense amount of directly-relevant data provided by the regulated facilities themselves, as a consequence of the NSPS and related ICR.<sup>25</sup> Strikingly, U.S. EPA does not reference any of this compliance data, place any of the reports in the docket, or even acknowledge the existence of this data in the preamble to the proposed amendments or supporting documents.

The Regulatory Impact Analysis (RIA) for the proposed amendments repeatedly violates the additional requirement of Clean Air Act section 307(d) that the statement of basis and purpose “set forth or summarize and provide a reference to any pertinent findings, recommendations, and comments by . . . the National Academy of Sciences, and, if the proposal differs in any important respect from any of these recommendations, an explanation of the reasons for such differences.”<sup>26</sup> In 2017, the National Academies of Sciences, Engineering, and Medicine released a report examining potential approaches for a comprehensive update to the methodology for estimating the social cost of GHGs to ensure resulting cost estimates reflect the best available science.<sup>27</sup> The report makes several “pertinent findings, recommendations, and comments” with which the RIA for the proposed NSPS amendments fails to engage.

Regarding the time horizon for which impacts are evaluated, for example, the National Academies report says, “The socioeconomic projections should extend far enough in the future to provide inputs for estimation of the vast majority of discounted climate damages.”<sup>28</sup> The RIA for the proposed amendments instead provides an economic analysis over a time horizon of only six years (2019-2025) without basis or

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<sup>23</sup> *E.g., id.* at 52064, 52075; see EPA Analysis of Well Site Fugitive Emissions Monitoring Data Provided by API, April 17, 2018, Docket ID No. EPA-HQ-OAR-2017-0483; EPA Analysis of Fugitive Emissions Data Provided by INGAA, Aug. 21, 2018, Docket ID No. EPA-HQ-OAR-2017-0483.

<sup>24</sup> “An ANPRM [Advance Notice of Proposed Rulemaking] is a ‘notice’ intended to solicit comments and/or information from all segments of the public interested in a particular issue prior to an agency determining whether an action will be proposed. As such, it does not propose or impose any regulatory requirements.” U.S. EPA Office of Policy, EPA’s Action Development Process: Guidance for EPA Staff on Developing Quality Actions, March 2011, p. 40, *available at* [https://yosemite.epa.gov/sab/5CSABPRODUCT.nsf/5088B3878A90053E8525788E005EC8D8/\\$File/adp03-00-11.pdf](https://yosemite.epa.gov/sab/5CSABPRODUCT.nsf/5088B3878A90053E8525788E005EC8D8/$File/adp03-00-11.pdf).

<sup>25</sup> 81 Fed. Reg. 35,824 (June 3, 2016); U.S. EPA ICR 2523.01c, RIN 2060-AS30, *available at* [https://www.reginfo.gov/public/do/PRAViewDocument?ref\\_nbr=201807-2060-002](https://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=201807-2060-002).

<sup>26</sup> 42 U.S.C. § 7607(d)(3).

<sup>27</sup> National Academies of Science, Engineering, and Medicine, *Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide*, 2017, *available at* <http://www.nap.edu/24651> (“National Academies”).

<sup>28</sup> *Id.* at 64.

justification,<sup>29</sup> and does not acknowledge this aspect of the National Academies report at all.

Additionally, as discussed further below, the proposed amendments rely on U.S. EPA's outcome-seeking application of an "interim domestic" social cost of methane (SC-CH<sub>4</sub>), rather than the global value traditionally employed, to minimize the monetized costs of the increased methane emissions that would result from the proposed amendments. The National Academies report notes that domestic-only values for the social costs of GHGs have not been adequately researched and are not yet appropriate for application: "Estimation of the net damages per ton of [GHG] emissions to the United States alone, beyond the approximations done by the [Interagency Working Group], is feasible in principle; however it is limited by the existing [Social Cost-Integrated Assessment Model] methodologies, which focus primarily on global estimates and do not model all relevant interactions among regions."<sup>30</sup> U.S. EPA acknowledges the National Academies' caveat and pledges to address the disparity in the future.<sup>31</sup> However, this does not meet the statutory requirement to, "if the proposal differs in any important respect from any of these recommendations, [provide] an explanation of the reasons for such differences."<sup>32</sup>

**The specific proposed amendments are arbitrary, insufficiently explained, and unsupported by the record.**

An agency action is arbitrary and capricious, in violation of the Administrative Procedure Act,<sup>33</sup> "if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise."<sup>34</sup>

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<sup>29</sup> Regulatory Impact Analysis for the Proposed Reconsideration of the Oil and Natural Gas Sector Emission Standards for New, Reconstructed, and Modified Sources, Sept. 2018, Docket ID No. EPA-HQ-OAR-2017-0483-0082 ("Proposal RIA"), at 2-23. Additional issues with this limited time horizon are discussed below.

<sup>30</sup> National Academies at 12.

<sup>31</sup> Proposal RIA at 3-8-3-9, citing National Academies ("The SC-CH<sub>4</sub> estimates developed under E.O. 13783 will be used in regulatory analysis until improved domestic estimates can be developed, which will take into consideration the recent recommendations from the National Academies of Sciences, Engineering, and Medicine for a comprehensive update to the current methodology to ensure that the social cost of greenhouse gas estimates reflect the best available science.").

<sup>32</sup> 42 U.S.C. § 7607(d)(3).

<sup>33</sup> 5 U.S.C. § 552.

<sup>34</sup> *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

Changes in agency policy positions are permissible only when the agency provides reasoned justification for the change. This includes a reasoned explanation for its rejection of any previous factual findings: “In such cases it is not that further justification is demanded by the mere fact of policy change; but that a reasoned explanation is needed for disregarding facts and circumstances that underlay or were engendered by the prior policy.”<sup>35</sup>

U.S. EPA’s proposed amendments fail on multiple fronts. U.S. EPA demonstrates no factual basis for rejecting or revising the conclusions set forth in the rulemaking record for the NSPS. U.S. EPA entirely fails to consider important aspects of the issues, offers justifications that run counter to the evidence before the agency, and insufficiently explains the reasons for its change and rejection of earlier determinations.

U.S. EPA bases its revisions on data that it suggests it did not consider in 2016.

U.S. EPA relies on a 2011 study to justify many of its policy changes, suggesting that it was not aware of and did not consider the study in promulgating the NSPS in 2016. In the preamble to the proposed amendments, U.S. EPA asserts, “Following promulgation of the 2016 NSPS OOOOa, the EPA received information from one stakeholder which contained component level emissions information for well sites in the Dallas/Fort Worth area (herein referred to as the “Fort Worth Study”).<sup>36</sup> The Technical Support Document (TSD) for the proposed amendments also describes the study data as having been received “[f]ollowing promulgation of the 2016 NSPS OOOOa[.]”<sup>37</sup> In a memorandum to the rulemaking docket analyzing the Fort Worth Study data, U.S. EPA describes the Fort Worth study as “additional data that was provided subsequent to the promulgation of the 2016 NSPS OOOOa.”<sup>38</sup> As such, U.S. EPA suggests that its new consideration of this study justifies different conclusions than it reached in 2016.

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<sup>35</sup> *F.C.C. v. Fox Television Stations, Inc.*, 556 U.S. 502, 515–16 (2009) (internal citation omitted).

<sup>36</sup> 83 Fed. Reg. at 52,067, citing *The Natural Gas Air Quality Study (Final Report)*, prepared by Eastern Research Group, Inc., July 13, 2011, *available at* <http://fortworthtexas.gov/gaswells/air-quality-study/final/>.

<sup>37</sup> Background Technical Support Document for the Proposed Reconsideration of the New Source Performance Standards 40 CFR Part 60, subpart OOOOa, September 2018, Docket ID No. EPA-HQ-OAR-2017-0483-0040 (“Proposal TSD”), p. 13, citing *The Fort Worth Study, Natural Gas Air Quality Study (Final Report)*, prepared by Eastern Research Group, Inc., July 13, 2011, *available at* <http://fortworthtexas.gov/gaswells/air-quality-study/final/>.

<sup>38</sup> *Analysis of Low Production Well Site Fugitive Emissions from the Fort Worth Air Quality Study*, May 8, 2018, Docket ID No. EPA-HQ-OAR-2017-0483-0037, citing *The Natural Gas Air Quality Study (Final Report)*, prepared by Eastern Research Group, Inc., July 13, 2011, *available at* <http://fortworthtexas.gov/gaswells/air-quality-study/final/>.

In actuality, U.S. EPA included the Fort Worth study in its docketed list of data sources considered in promulgating the NSPS<sup>39</sup> and even cited the study in the final NSPS preamble.<sup>40</sup> “[T]he requirement that an agency provide reasoned explanation for its action would ordinarily demand that it display awareness that it *is* changing position.”<sup>41</sup> U.S. EPA does not manifest this awareness, let alone attempt to justify this change.

EPA relies on industry studies while ignoring non-profit research.

U.S. EPA largely bases its proposed amendments on comments from industry petitioners and data supplied by industry, while largely ignoring academic and non-profit research that may undermine its justifications for the proposal. Like the industry petitioners for reconsideration, to whom U.S. EPA granted reconsideration and in response to whose requests U.S. EPA proposed the NSPS amendments, several environmental organizations petitioned for reconsideration in August, 2016.<sup>42</sup> In addition to never responding to the organizations’ petition, U.S. EPA does not consider or address the petition comments or supporting data.

“In support of this reconsideration effort,” U.S. EPA commissioned a consulting firm “to identify readily-available studies/analyses with information related to the fugitive emissions from low production oil and natural gas well sites.”<sup>43</sup> The firm screened over 100 studies and other “readily-available documents related to oil and natural gas production,” plus websites of oil and gas producing states like Colorado, Wyoming, Texas, California, and Pennsylvania . . . to identify any potentially useful fugitive emissions data from well production facilities.”<sup>44</sup> The list of studies identified through that effort does not include the environmental organizations’ studies, but does include industry-identified studies that endeavor to refute the environmental organizations’ studies.<sup>45</sup>

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<sup>39</sup> Equipment Leaks Data: US EPA and Peer Reviewed Sources and Other Sources, Docket ID No. EPA-HQ-OAR-2010-0505-7589.

<sup>40</sup> 81 Fed. Reg. at 35,860 (“Based on a study conducted for the city of Fort Worth, Texas, we estimate that, on average, there are 22 well sites within a company’s specific geographic region. In this study, a total of 375 well pads were identified in the Fort Worth area, and these well pads were owned and operated by 17 different companies, or an average of 22 well pads per company.”), citing ERG and Sage Environmental Consulting, LP, City of Fort Worth Natural Gas Air Quality Study, Final Report, prepared for the City of Fort Worth, Texas, July 13, 2011, available at <http://fortworthtexas.gov/gaswells/default.aspx?id=87074> (link no longer active).

<sup>41</sup> *F.C.C. v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009).

<sup>42</sup> Environmental Defense Fund, Clean Air Task Force, et al., Petition for Reconsideration, August 2, 2016, Docket ID No. EPA-HQ-OAR-2017-0483-0017.

<sup>43</sup> Low Production Well Site Fugitive Emissions, Memorandum from Tanya Parise, SC&A, Inc., to Karen Marsh, U.S. EPA Office of Air Quality Programs and Standards, March 2, 2018, Docket ID No. EPA-HQ-OAR-2017-0483-0034.

<sup>44</sup> *Ibid.*

<sup>45</sup> *Id.* at 3.

Reducing monitoring frequency of non-low producing wells is contrary to U.S. EPA's own analysis.

Despite U.S. EPA's cherry-picking of the data it incorporated into its revised model plant analysis, the revised model plant analysis *still* demonstrates that semiannual monitoring of non-low production wells, as required under the NSPS, is cost-effective.<sup>46</sup> Unsatisfied with this result, U.S. EPA proposes to reduce the required monitoring frequency for non-low producing wells from semiannual to annual monitoring because their updated analysis "indicate[s] we may have overestimated the emission reductions and, therefore, the cost effectiveness, due to gaps in available data and factors that may bias the analysis toward overestimation of reductions."<sup>47</sup> U.S. EPA here overrides not only its prior determination and the factual underpinning, but even its own current analysis. Potential overestimates are not sufficient justification to reduce the monitoring frequency required by a rule that has already been in place for two years. U.S. EPA here "offer[s] an explanation for its decision that runs counter to the evidence before the agency."<sup>48</sup>

Instead, U.S. EPA proposes to amend the properly-promulgated requirement to annual monitoring because "petitioners have requested that we consider annual monitoring, which suggests that they are able to bear such costs."<sup>49</sup> Even if cost-effectiveness were a legitimate sole basis for gutting the NSPS requirements (which, given U.S. EPA's Clean Air Act obligations described above, it is not), this is not the reasoned justification required under the APA.

Additionally, California's Oil and Gas Regulation requires quarterly LDAR inspections of all wells,<sup>50</sup> demonstrating the feasibility of the semiannual inspections of well sites currently required by the NSPS.<sup>51</sup>

Reducing monitoring frequency of low producing wells is unsupported by data.

U.S. EPA proposes to divide the required monitoring frequency of low producing wells by four, from semiannual to biennial monitoring, which is half the monitoring frequency it proposes for non-low producing wells. While U.S. EPA claims that this proposed disparity is justified by the Fort Worth Study, the study demonstrates average methane emissions of 157 tons per year at non-low production wells versus 116 tons per year at low-production wells.<sup>52</sup> This average emissions difference of only 26 percent cannot justify U.S. EPA's proposal to require monitoring of low production wells only half as

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<sup>46</sup> 83 Fed. Reg. at 52,062.

<sup>47</sup> *Ibid.*

<sup>48</sup> See *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

<sup>49</sup> 83 Fed. Reg. at 52,065.

<sup>50</sup> Cal. Code Regs., tit. 17, § 95669.

<sup>51</sup> See 40 C.F.R. §§ 60.5397a(g); 60.5365a(i)(2).

<sup>52</sup> 83 Fed. Reg. at 52,068.

frequently as it proposes to require monitoring of non-low production wells, and a quarter as frequently as currently required.

U.S. EPA also revised its new model plant to reflect the lower equipment counts at low production well sites, basing its updated equipment counts exclusively on the Fort Worth Study. Baseline emissions from the updated model plants were estimated by U.S. EPA to be 5.91 tons per year for non-low production wells and 4.80 tons per year for low production wells.<sup>53</sup> This difference in baseline emissions of only 19 percent also does not reasonably justify U.S. EPA's proposal to reduce the frequency of required monitoring from semiannual to biennial for low production wells.

Even if low production wells have a relatively smaller number of components – U.S. EPA's primary argument for the disparate proposed requirements – they could still have one or more “super-emitter” components. These components leak hundreds or thousands of times more than a typical leaking component, and academic studies have demonstrated their prevalence.<sup>54, 55, 56, 57</sup> U.S. EPA acknowledges the existence of super-emitters in the preamble to the proposed amendments: “[A] few outliers were identified suggesting that low production well sites may have the potential for fugitive emissions greater than the estimates in the model plants.”<sup>58</sup> Rather than addressing these studies, however, U.S. EPA only mentions them as part of an industry petitioner's assertion that the existence of super-emitters undermines consideration of total well site emissions as a percentage of production.<sup>59</sup> In fact, the super-emitter studies support more frequent monitoring for all well sites in order to detect high emitting, low production wells that would be allowed to leak undetected for two years under the proposed amendments.

A study of oil and gas production pads in Texas, Colorado, and Wyoming found that only approximately 10 percent of the variation in emission rates between production

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<sup>53</sup> *Ibid.*

<sup>54</sup> Brandt, A.R., et al., Methane Leaks from North American Natural Gas Systems, *Science*, 343(6172), 2014, pp. 733-735, available at <http://science.sciencemag.org/content/343/6172/733.full>.

<sup>55</sup> Subramanian, R., et al., Methane Emissions from Natural Gas Compressor Stations in the Transmission and Storage Sector: Measurements and Comparisons with the EPA Greenhouse Gas Reporting Program Protocol, *Environ. Sci. Technol.*, 49, 2015, pp. 3252-3261, available at <https://pubs.acs.org/doi/abs/10.1021/es5060258>.

<sup>56</sup> Zavala-Araiza, D., et al., Toward a Functional Definition of Methane Super-Emitters: Application to Natural Gas Production Sites, *Environ. Sci. Technol.*, 49, 2015, pp. 8167-8174, available at <http://pubs.acs.org/doi/abs/10.1021/acs.est.5b00133>.

<sup>57</sup> Zimmerle, D.J., et al., Methane Emissions from the Natural Gas Transmission and Storage System in the United States, *Environ. Sci. Technol.*, 49, 2015, pp. 9374-9383, available at <https://pubs.acs.org/doi/abs/10.1021/acs.est.5b01669>.

<sup>58</sup> 83 Fed. Reg. at 52068.

<sup>59</sup> *Id.* at 52067.

sites was explained by variation in production levels.<sup>60</sup> The authors hypothesized that “[t]he weak correlation between emission and production rates may indicate that maintenance-related stochastic variables and design of production and control equipment are factors determining emissions.”<sup>61</sup> As the study data does not show a strong correlation between production and emissions,<sup>62</sup> this study further undermines U.S. EPA’s proposal to create disparate monitoring requirements for well sites on the basis of production.

U.S. EPA also acknowledges that the studies it cites “indicated that storage vessel thief hatches were a large source of fugitive emissions when compared to other fugitive emissions components, such as valves and connectors.”<sup>63</sup> The non-low and low production well site model plants, as revised by U.S. EPA for this action, each have one storage vessel.<sup>64</sup> Thus, the equipment count of the highest-emitting equipment, storage vessel thief hatches, is the same at non-low and low production wells, which also undermines U.S. EPA’s claimed justification for adding disparities to the existing requirements.

California’s successful implementation of its very similar Oil and Gas Regulation also undermines U.S. EPA’s justification for amending the current required monitoring frequencies for non-low and low production wells.<sup>65</sup> California’s Oil and Gas Regulation requires quarterly LDAR inspections of all wells, regardless of production.<sup>66</sup> Additionally, LDAR costs are correlated with the number of components,<sup>67</sup> so sites with a relatively smaller number of components would have a similarly low cost to implement. Accordingly, low production wells should be subject to a LDAR provision with equivalent monitoring frequencies to non-low production wells in order to find and repair leaking components.

If U.S. EPA finalizes a low-producing well subcategory with different monitoring requirements, which CARB opposes, the final rule must not allow non-low producing wells to become low producing wells (subject to less frequent monitoring) over time when their production changes. If a non-low producing well produces less over time and becomes a low producing well, it will likely maintain the same equipment at the site. One of U.S. EPA’s arguments for requiring less frequent monitoring of low producing

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<sup>60</sup> Brantley, H.L., et al., Assessment of Methane Emissions from Oil and Gas Production Pads using Mobile Measurements, *Environ. Sci. Technol.*, 48(24), 2014, pp. 14508-14515, available at <https://pubs.acs.org/doi/abs/10.1021/es503070q>.

<sup>61</sup> *Ibid.*

<sup>62</sup> *Ibid.*

<sup>63</sup> 83 Fed. Reg. at 52068.

<sup>64</sup> Proposal TSD.

<sup>65</sup> Cal. Code Regs., tit. 17, § 95669.

<sup>66</sup> *Ibid.*

<sup>67</sup> CARB Staff Report: Initial Statement of Reasons, Appendix B: Economic Analysis, May 2016, pp. 35-36, available at <https://www.arb.ca.gov/regact/2016/oilandgas2016/oilandgasappb.pdf>.

wells is the lower equipment count, which would not be valid for non-low producing wells that become low producing wells.

Exemption of wellhead only well sites from LDAR requirements is not justified.

U.S. EPA proposes to eliminate the existing fugitive monitoring requirements for well sites from which “all major production and processing equipment” is removed, such that it becomes a new wellhead only well site.<sup>68</sup> U.S. EPA should not weaken the NSPS regarding wellhead-only well sites as proposed, but should instead strengthen it by removing the existing LDAR monitoring exemption for existing wellhead only well sites. Although wellhead-only well sites have less ancillary equipment and therefore fewer fugitive emissions components, the wellhead itself does have emissions and should be inspected for leaks. A study by Eastern Research Group, Inc. found that gas wellheads and oil wellheads comprise 12.6 percent and 4.1 percent, respectively, of VOC emissions from onshore production in Texas.<sup>69</sup> Successful implementation of California’s Oil and Gas Regulation, which requires quarterly inspections of wellhead only sites (like all well sites), demonstrates the feasibility of monitoring wellhead only well sites.<sup>70</sup>

Additionally, while the proposed amended regulatory text defines “major production and processing equipment” for these purposes as “compressors, glycol dehydrators, heater/treaters, pneumatic pumps, pneumatic controllers, separators, and storage vessels collecting crude oil, condensate, intermediate hydrocarbon liquids, or produced water,”<sup>71</sup> the preamble to the proposed amendments omits compressors from the definition.<sup>72</sup> To the extent that U.S. EPA may consider omitting compressors from the final amended regulatory definition, CARB notes that according to U.S. EPA’s study of equipment leaks in the natural gas industry, an average small gathering compressor<sup>73</sup> emits about as many cubic feet of methane per year as an average separator, heater, and dehydrator combined.<sup>74</sup> U.S. EPA provides no justification for including separators,

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<sup>68</sup> 83 Fed. Reg. at 52066 (“We are, therefore, proposing to define ‘major production and processing equipment’ as including separators, heater treaters, storage vessels, glycol dehydrators, pneumatic pumps, or pneumatic controllers.”).

<sup>69</sup> Emissions from Oil and Gas Production Facilities, TCEQ Contract 582-7-84003, Prepared by Eastern Research Group, Inc., August 31, 2007, *available at* [https://www.tceq.texas.gov/assets/public/implementation/air/am/contracts/reports/ei/5820784003FY0701-20090831-ergi-ei\\_from\\_old\\_gas\\_facilities.pdf](https://www.tceq.texas.gov/assets/public/implementation/air/am/contracts/reports/ei/5820784003FY0701-20090831-ergi-ei_from_old_gas_facilities.pdf). Wellhead emissions were estimated using emission factors, wellhead counts, and production data.

<sup>70</sup> Cal. Code Regs., tit. 17, § 95669.

<sup>71</sup> 83 Fed. Reg. at 52,106.

<sup>72</sup> *Id.* at 52,066.

<sup>73</sup> Located at onshore production facilities in the western U.S.

<sup>74</sup> U.S. EPA data shows average methane emissions of 97,729 standard cubic feet per compressor per year, compared to average annual methane emissions of 44,536 cubic feet per separator, 21,066 cubic feet per heater, and 33,262 cubic feet per dehydrator. Methane

heaters, and dehydrators in its amended definition while omitting compressors, nor an acknowledgement that this may be under consideration.

Reducing monitoring frequency of compressor stations is contrary to U.S. EPA's analysis.

U.S. EPA's co-proposals to reduce the required monitoring frequency for compressor stations from quarterly to semiannual or annual are unsupported by either data or reasoning. U.S. EPA rejects its own quantitative analysis, which supports maintaining existing quarterly monitoring requirements, because it *may overestimate cost-effectiveness*.<sup>75</sup> Aside from "uncertainty" and "[i]nab[ility] to conclude that quarterly monitoring is cost-effective for compressor stations," U.S. EPA identifies no data or evidence to support its co-proposed reductions in monitoring frequency from existing law.

U.S. EPA acknowledges in the preamble to its proposed amendments, "The unique operating characteristics of compressor stations may support more frequent monitoring of compressor stations as compared to well sites."<sup>76</sup> U.S. EPA also acknowledges that components at compressor stations are subject to vibration and temperature cycling, and the existence of studies demonstrating "that components subject to vibration, high use, or temperature cycling are the most leak-prone."<sup>77</sup> These arguments support more frequent monitoring of compressor stations, rather than the reduced monitoring frequency that U.S. EPA is co-proposing. In addition, California's Oil and Gas Regulation requires quarterly inspections for compressor stations,<sup>78</sup> demonstrating the feasibility of this approach.

The proposed leak repair timeline revisions are impermissibly vague.

U.S. EPA proposes to amend the NSPS leak repair timeline requirements, which currently require repair within 30 days, so that only a "first attempt at repair" must be made within 30 days, with complete repair required within 60 days. The proposed definition of "first attempt at repair," "an action taken for the purpose of stopping or reducing fugitive emissions of methane or VOC to the atmosphere,"<sup>79</sup> is impermissibly vague. U.S. EPA provides no example or indication that any action – no matter how

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Emissions from the Natural Gas Industry, Volume 8: Equipment Leaks, prepared by National Risk Management Research Laboratory, Research Triangle Park, NC, June 1996, Table 5-3, available at <https://nepis.epa.gov/Exe/ZyPDF.cgi/P1006YAT.PDF?Dockey=P1006YAT.PDF>.

<sup>75</sup> 83 Fed. Reg. at 52,070-71.

<sup>76</sup> *Id.* at 52,070.

<sup>77</sup> *Ibid.*, citing Canadian Association of Petroleum Producers, Best Management Practice. Management of Fugitive Emissions at Upstream Oil and Gas Facilities, January 2007.

<sup>78</sup> Cal. Code Regs., tit. 17, § 95669.

<sup>79</sup> 83 Fed. Reg. at 52,106.

minor, improperly targeted, or otherwise ineffective – would *not* qualify as a “first attempt at repair.”<sup>80</sup>

Not only does a required “first attempt at repair” within 30 days fail to provide any legal standard, it also fails in practice to limit emissions any more than U.S. EPA’s revised 60-day timeframe for repair completion. U.S. EPA endeavors to justify this proposed doubling of the required repair timeline as avoiding an “unintended noncompliance issue,” by which facilities could be penalized for good-faith but unknowingly unsuccessful attempts at repair completion within 30 days.<sup>81</sup> Rather than targeting this ostensible compliance concern with any particularity (whether through narrow regulatory amendment or enforcement discretion), U.S. EPA proposes a blanket doubling of the required repair completion timeline, and thereby a doubling of the pollution that these sources may emit unabated.

U.S. EPA should not weaken the NSPS leak repair timeline requirements; rather the agency should revise the original rule to require complete repair, including inspection to verify that the leak has been abated, within 30 days. This would eliminate the 30-day resurvey requirement that U.S. EPA cites as the source of its “unintended noncompliance issue.”<sup>82</sup> The feasibility of this change is supported by existing state regulations; of the various state LDAR rules that U.S. EPA proposes to deem equivalent to the proposed amended NSPS, all require complete repair of leaks within 30 days or less.<sup>83</sup> California’s Oil and Gas Regulation demonstrates the feasibility of a leak repair timeline even shorter than that required by the NSPS, let alone U.S. EPA’s proposed extensions. CARB is successfully implementing a regulation that requires leak repair to be *completed* within 5 to 14 days, depending on the measured leak concentration; the repair must be inspected to verify compliance during this 5 to 14-day period.<sup>84</sup>

The equivalency determinations used to establish an Alternative Means of Emission Limitation determination for some existing state programs are unjustified.

U.S. EPA proposes to determine that certain state programs are qualitatively equivalent to its weakened proposed amended NSPS, and therefore extend an Alternative Means

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<sup>80</sup> See *ibid.* U.S. EPA provides examples, such as tightening nuts and bolts, that “first attempts at repair include, but are not limited to[.]” *Ibid.*

<sup>81</sup> *Id.* at 52,075.

<sup>82</sup> See *ibid.*

<sup>83</sup> See *id.* at 52,079 et seq. and discussion below. For example, California’s regulation requires repair to be completed within 5 to 14 days depending on the measured leak concentration, and the repair must be inspected to verify compliance during the 5 to 14 days. A delay of repair up to 30 days may be granted by CARB if the owner or operator can provide proof that the parts or equipment required to make necessary repairs have been ordered. *Id.* at § 95669.

<sup>84</sup> *Id.* at § 95669. CARB may approve a repair delay of up to 30 days if the owner or operator can provide proof that the parts or equipment required to make necessary repairs have been ordered. *Ibid.*

of Emission Limitation (AMEL) designation to these states. As described in the remainder of this comment, the proposed NSPS amendments themselves are unlawful and impermissible, so U.S. EPA may not extend AMEL to state programs that are equivalent only to the proposed amendments but not the existing NSPS.

U.S. EPA makes no effort to quantify emission reductions from the states' rules and perform a more detailed comparison than qualitative program components, rendering the equivalency determinations unjustified. CARB has preliminarily assessed the state programs against the NSPS and determined that the Ohio rule is not likely to achieve equivalent emission reductions to the NSPS, and only the California, Colorado, Pennsylvania, Texas (within narrow parameters<sup>85</sup>), and Utah monitoring programs are likely to be equivalent. U.S. EPA should quantitatively evaluate the state rules to reach a final determination.

Despite its proposal to extend AMEL (reflecting the proposed amendments) to several states, U.S. EPA notes, "In most of the [state] programs, the affected fugitive components were different than our definition of fugitive emissions component."<sup>86</sup> As such, U.S. EPA is "proposing alternative standards that also require the owner or operator to survey [U.S. EPA's] entire list of fugitive emissions components, regardless of whether they are affected components in the state program."<sup>87</sup> This seems to acknowledge that some of the state programs proposed for AMEL may not, in fact, be equivalent to even U.S. EPA's diluted proposed requirements. U.S. EPA's own analysis shows that Ohio, Texas, and Utah do not regulate all of the components (at the same emission thresholds) that are subject to the weakened proposed amended NSPS.<sup>88</sup> If U.S. EPA finalizes AMEL determinations for states, it must also finalize standards requiring owners and operators to, at minimum, survey any components for which the state rule does not require surveys; compliance with the state rule cannot otherwise be equivalent even with the proposed amendments.

U.S. EPA proposes to extend an AMEL determination to Texas's rule regarding well sites if the leak definition used for "monitoring is an instrument reading of 2,000 parts per million (ppm) or greater."<sup>89</sup> Similarly, U.S. EPA's State Fugitives Memorandum

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<sup>85</sup> Only under an "Air Quality Standard Permit," for wellsite monitoring, and if a leak is defined as an instrument reading of 2,000 ppm or greater, as specified in the proposed amendatory text. See 83 Fed. Reg. at 52,096.

<sup>86</sup> *Id.* at 52,080.

<sup>87</sup> *Ibid.*

<sup>88</sup> Equivalency of State Fugitive Emissions Programs for Well Sites and Compressor Stations to Proposed Standards at 40 CFR Part 60, Subpart OOOOa, April 12, 2018, Docket ID No. EPA-HQ-OAR-2017-0483-0041, Table 2. Colorado requires annual monitoring for low-emitting wells (6-12 tons per year (tpy) VOC) and compressors (0-12 tpy VOC), and monthly monitoring for high-emitting wells (more than 20 tpy VOC or more than 50 tpy for wells with storage tanks) and compressors (more than 50 tpy VOC). Col. Reg. 7, § XVII.F.

<sup>89</sup> 83 Fed. Reg. at 52,096.

asserts that the 2,000 ppm leak definition required by Texas code is equivalent to the proposed NSPS.<sup>90</sup> However, the 2,000 ppm limit in Texas code only applies to pumps and compressors at 1) facilities located less than 500 feet from the nearest off-plant receptor with uncontrolled fugitive VOC emissions greater than or equal to 25 tons per year, or 2) facilities with uncontrolled fugitive VOC emissions greater than or equal to 40 tons per year.<sup>91</sup> At all other facilities, the Texas leak definition for components is 10,000 ppm.<sup>92</sup> CARB foresees a scenario whereby an operator in Texas might argue that by utilizing a leak threshold of 10,000 ppm they are complying with the state program and thus the NSPS, even though U.S. EPA's equivalency determination only applies to the 2,000 ppm leak threshold.

Additionally, U.S. EPA has declined to include Texas in its required analyses. U.S. EPA proposes an AMEL determination only for well sites in Texas using the "Air Quality Standard Permit for Oil and Gas Handling and Production Facilities."<sup>93</sup> However, the TSD for the proposed amendments acknowledges, "however, most operators within the state are subject to the requirements of the permit by rule, which are not considered to be equivalent."<sup>94</sup> Therefore, the RIA for the proposed amendments states, "Requirements in Texas are not included . . . in this analysis because they include a permit by rule, which we do not consider equivalent in terms of overall emissions reductions."<sup>95</sup> It elaborates, "We do not consider the permit by rule in Texas as equivalent for RIA purposes because they are self-certified permits and we currently have a lack of certainty on the degree of enforcement of these rules."<sup>96</sup>

Finally, while California's Oil and Gas Regulation is equally or more stringent than the 2016 NSPS, we note factual errors in U.S. EPA's summary of California's Oil and Gas Regulation requirements. The memorandum omits several components that are in fact subject to the LDAR requirements in California's Oil and Gas Regulation, including compressors, covers, closed vent systems, instruments, storage vessels, and thief

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<sup>90</sup> Equivalency of State Fugitive Emissions Programs for Well Sites and Compressor Stations to Proposed Standards at 40 CFR Part 60, Subpart OOOOa, April 12, 2018, Docket ID No. EPA-HQ-OAR-2017-0483-0041, Table 21, citing Texas Admin. Code, tit. 30, § 106.620.

<sup>91</sup> Texas Admin. Code, tit. 30, § 106.620.

<sup>92</sup> *Ibid.* This applies to 1) facilities located less than 500 feet from the nearest off-plant receptor with uncontrolled fugitive VOC emissions greater than or equal to 10 tons per year, but less than 25 tons per year, or 2) facilities located greater than or equal to 500 feet from the nearest off-plant receptor with uncontrolled fugitive VOC emissions greater than or equal to 25 tons per year.

<sup>93</sup> 83 Fed. Reg. at 52,096.

<sup>94</sup> Proposal TSD, Section 3.2.2.1.

<sup>95</sup> Proposal RIA at 2-10.

<sup>96</sup> *Id.*, note 24.

hatches.<sup>97</sup> We note these omissions both for the sake of accuracy and to note the possibility that U.S. EPA may have made errors in its analyses of other States' requirements. This degree of error would be concerning if U.S. EPA erroneously *included*, rather than *excluded*, requirements of other states' programs, making them appear more rigorous than they actually are.

**The economic analysis is biased, incomplete, and does not justify the proposed amendments.**

As discussed above, Clean Air Act section 111(b) requires U.S. EPA to demonstrate that any standard or revision it promulgates under the section, such as the proposed NSPS amendments, "reflects the degree of emission limitation achievable through the application of the best system of emission reduction,"<sup>98</sup> "consider[ing] the emission limitations and percent reductions achieved in practice."<sup>99</sup> Given this, U.S. EPA may not justify its proposed revisions on the basis of cost savings or cost-effectiveness, as it attempts to do. Even if this were legally permissible, however, U.S. EPA's RIA fails to demonstrate that the proposed amendments would provide overall benefits or improve the cost-effectiveness of the NSPS. The RIA uses multiple assumptions and methodologies to minimize quantification of climate harm, and does not quantify all costs and associated harms of the proposed regulation, which result in an inaccurate and biased cost-benefit analysis.

Social cost of methane background.

The social cost of methane (SC-CH<sub>4</sub>) is the cost to society (in U.S. dollars) of adding 1-metric ton of CH<sub>4</sub> to the atmosphere in a particular year; it is intended to provide a measure of the damages from global climate change. Framed alternatively, it is the avoided cost (or benefit) of reducing CH<sub>4</sub> emissions by the same amount in a given year. The SC-CH<sub>4</sub> is a critically important metric to accurately estimate because U.S. EPA justifies its proposed amendments, in large part, as providing net cost-savings – a conclusion that U.S. EPA can only reach by manipulating the SC-CH<sub>4</sub> value it applies to the analysis. Additionally, without an accurate estimation of the SC-CH<sub>4</sub>, U.S. EPA cannot provide the informed analysis required by law.

In 2008, the U.S. Ninth Circuit Court of Appeals set aside the National Highway Transportation Safety Administration's (NHTSA) 2006 Corporate Average Fuel Economy (CAFE) standard as arbitrary and capricious because it failed to monetize the

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<sup>97</sup> Equivalency of State Fugitive Emissions Programs for Well Sites and Compressor Stations to Proposed Standards at 40 CFR Part 60, Subpart OOOOa, April 12, 2018, Docket ID No. EPA-HQ-OAR-2017-0483-0041, Table 2, citing Cal. Code Regs., tit. 17, § 95669.

<sup>98</sup> 42 U.S.C. § 7411(a).

<sup>99</sup> *Id.* at § 7411(b)(1)(B).

benefits of GHG emission reductions.<sup>100</sup> There, the court characterized reductions in carbon emissions as “the most significant benefit of more stringent CAFE standards.”<sup>101</sup> Subsequently, federal agencies have incorporated the social costs of GHGs, including carbon dioxide, methane, and nitrous oxide, into their analysis of regulatory actions in an effort to comprehensively account for the economic impact of regulations that impact GHG emissions.

Beginning in 2009, the President’s Council of Economic Advisors and the U.S. Office of Management and Budget (OMB) convened the Interagency Working Group (IWG) on the Social Cost of GHGs (SC-GHGs) to develop a methodology for estimating the social cost of carbon (SC-CO<sub>2</sub>) and other GHGs. This methodology relied on a standardized range of assumptions that could be used consistently when estimating the benefits of regulations across agencies. The IWG, comprised of scientific and economic experts, recommended the use of SC-CH<sub>4</sub> values based on three integrated assessment models (IAMs) developed over decades of global peer-reviewed research.<sup>102</sup> William Nordhaus, awarded the Sverigse Riksbank Prize in Economic Sciences in Memory of Alfred Nobel in 2018 and a member of the IWG,<sup>103</sup> defines IAMs as “approaches that integrate knowledge from two or more domains into a single framework.”<sup>104</sup> IAMs used in the estimation of the SC-CH<sub>4</sub> combine models of the global economy and atmosphere to estimate geophysical and economic variables over time.<sup>105</sup> Given the complexity of IAMs, the IWG provided guidance in transparency of methodology and assumptions as well as consistency across the input and models used to estimate the SC-CH<sub>4</sub>, issued as TSDs.<sup>106</sup> These models and methodologies have been modified and updated since first being utilized and represent the best available science in the field.

U.S. EPA is bound to use the best available science when setting standards and analyzing alternatives. It is further directed by E.O. 12866 (as modified by E.O. 13563) to conduct a cost-benefit analysis for all economically significant regulations that is based on the “best available science,” use the “best available techniques” to quantify anticipated present and future benefits and costs, and use the best reasonably

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<sup>100</sup> *Center for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1203 (9th Cir. 2008).

<sup>101</sup> *Id.* at 1199.

<sup>102</sup> See IWG, Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide, Aug. 2016 (“IWG Addendum”), available at [https://www.epa.gov/sites/production/files/2016-12/documents/addendum\\_to\\_sc-ghg\\_tsd\\_august\\_2016.pdf](https://www.epa.gov/sites/production/files/2016-12/documents/addendum_to_sc-ghg_tsd_august_2016.pdf).

<sup>103</sup> The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2018, <https://www.nobelprize.org/prizes/economics/2018/summary/>.

<sup>104</sup> William Nordhaus, Integrated economic and climate modeling, *Handbook of computable general equilibrium modeling*, ed. Peter Dixon and Dale Jorgenson, 2013, 1069-1131.

<sup>105</sup> See IWG Addendum.

<sup>106</sup> See *ibid.*

obtainable scientific, technical, and economic information.<sup>107</sup> OMB Circular A-4 further directs U.S. EPA actions in preparing regulatory analysis under E.O. 12866.<sup>108</sup> OMB Circular A-4 requires U.S. EPA to quantify anticipated benefits and costs of proposed rulemakings as accurately as possible using the best available techniques, and to ensure that any scientific and technological information or processes used to support their regulatory actions are objective.<sup>109</sup>

On March 28, 2017, the Presidential Executive Order on Promoting Energy Independence and Economic Growth, E.O. 13783, disbanded the IWG, withdrew the TSDs issued by the IWG, and instead directed all federal agencies to follow the guidance in OMB Circular A-4 when monetizing the value of changes in GHG emissions resulting from regulatory changes.<sup>110</sup> E.O. 13783 is internally contradictory: it withdrew the IWG's peer-reviewed TSDs as no longer representative of governmental policy, while directing agencies to base their regulatory analysis on the best available science and economics and OMB Circular A-4 (which it noted was "issued after peer review and public comment and has been widely accepted for more than a decade as embodying the best practices for conducting regulatory cost-benefit analysis.")<sup>111</sup>

The E.O.'s direction to disband the IWG and withdraw peer-reviewed and vetted scientific documents does not call into question the validity and scientific integrity of the IWG's SC-GHG estimates, or the merit of independent scientific work in regulatory processes. This E.O. provided no rationale or defense of this withdrawal and offers no scientific or economic rationale for the changed SC-GHG valuations, which are counter to existing U.S. EPA Guidance and the consensus of experts.<sup>112</sup> E.O. 13783 requires agencies to follow contradictory statutory and executive mandates when monetizing the social cost of GHGs that simultaneously require using the best available science, while also purporting to prohibit the use of the best available science on the subject. The IWG's work remains relevant, reliable, and appropriate for use for these purposes. CARB supports continued use of the IWG SC-CH<sub>4</sub> values and strongly suggests that U.S. EPA support and promote the IWG SC-CH<sub>4</sub> values for transparency and consistency of regulatory analyses, including for the proposed amendments.

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<sup>107</sup> E.O. 12866, "Regulatory Planning and Review," Sept. 30, 1993; Executive Order 13563, "Improving Regulation and Regulatory Review," Jan. 18, 2011.

<sup>108</sup> OMB Circular A-4, Sept. 17, 2003, *available at* <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf>.

<sup>109</sup> *Ibid.*

<sup>110</sup> 82 Fed. Reg. 16,093 (March 31, 2017).

<sup>111</sup> *Id.* at § 5(c), citing OMB Circular A-4.

<sup>112</sup> *E.g.*, Drupp, Moritz, et al., Discounting Disentangled, *American Economic Journal: Economic Policy*, 10 (4): 109-34, 2018, *available at* <https://www.aeaweb.org/articles?id=10.1257/pol.20160240&&from=f>.

Application of “interim domestic” social cost of methane is unjustified, inappropriate, and outcome-seeking.

As noted above, the U.S. Ninth Circuit Court of Appeals set aside NHTSA’s CAFE standard as arbitrary and capricious because it disregarded the benefits of GHG emission reductions.<sup>113</sup> The court held, “NHTSA . . . cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent [CAFE] standards.”<sup>114</sup> The SC-CH<sub>4</sub> analysis presented in the preamble and RIA for the proposed amendments is undermined by several fatal flaws, including the utilization of an inappropriate and poorly modeled “interim domestic” social cost of methane, and presenting only two inappropriate discount rates (which are inconsistently applied). These errors lead to social cost values that are a fraction of those used in hundreds of regulatory proceedings at the federal level. The “interim domestic” SC-CH<sub>4</sub> is in direct violation of U.S. EPA’s statutory mandates, Executive Orders 12866, 13563, and 13783, and Circular A-4.

In the NSPS RIA, the benefits of the proposed rule were quantified using the IWG SC-CH<sub>4</sub>. The economic analysis showed that global climate benefits generally<sup>115</sup> outweigh the compliance costs, providing justification for the proposal based on this metric alone, though other benefits were identified.<sup>116</sup> The interim domestic SC-CH<sub>4</sub> used for the proposed amendments, however, is between 6.6 and 8.2 times lower in value than the global SC-CH<sub>4</sub> for 2020 through 2025 based on U.S. EPA data for this proposal.<sup>117</sup> This change is outcome-seeking, attempting to minimize quantification of the harms associated with the proposal.

The “interim domestic” SC-CH<sub>4</sub> violates directives requiring use of the best available science.

The RIA for the proposed amendments utilizes an “interim domestic” SC-CH<sub>4</sub> valuation that contradicts E.O. 13783’s directive for estimates used in regulatory analyses to be “based on the best available science and economics.”<sup>118</sup> The “interim domestic” SC-CH<sub>4</sub>

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<sup>113</sup> *Center for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1203 (9th Cir. 2008).

<sup>114</sup> *Ibid.*

<sup>115</sup> Benefits outweigh compliance costs when a discount rate of 2.5% or 3% is used, but not when a discount rate of 5% is used.

<sup>116</sup> Regulatory Impact Analysis of the Final Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, May 2016, Docket ID No. EPA-HQ-OAR-2010-0505-7630, Table 1-2.

<sup>117</sup> Proposal RIA, Benefits and Tables OOOOa Reconsideration, Tab “SCCH<sub>4</sub>,” Docket ID No. EPA-HQ-OAR-2017-0483-0082, *available at* <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2017-0483-0082&attachmentNumber=1&contentType=excel12book>.

<sup>118</sup> 82 Fed. Reg. 16,093 (March 31, 2017), § 5(c).

also breaks with almost a decade of accepted peer-reviewed methodologies without rationale or justification and does not rely on the best available science and economics.

A domestic SC-CH<sub>4</sub> cannot follow the best available science because the existing integrated assessment models (IAMs) used to estimate the SC-CH<sub>4</sub> are not calibrated for domestic-only valuations. In the 2010 TSD for the Social Cost of Carbon, the IWG states, “As an empirical matter, the development of a domestic SC-CO<sub>2</sub> is greatly complicated by the relatively few region- or country-specific estimates of the SC-CO<sub>2</sub> in the literature.”<sup>119</sup> The IWG determined that a range of values from 7 to 23 percent of the global social cost value might be used to adjust the global SC-CO<sub>2</sub> to calculate domestic effects.<sup>120</sup> However, the IWG cautions, “[T]hese values are approximate, provisional, and highly speculative. There is no a priori reason why domestic benefits should be a constant fraction of net global damages over time.”<sup>121</sup>

In 2017, the National Academies of Sciences, Engineering, and Medicine released a report examining potential approaches for a comprehensive update to the social cost of carbon methodology to ensure resulting cost estimates reflect the best available science.<sup>122</sup> The report highlights the challenges in developing domestic SC-GHG estimates, given complex interactions related to migration, and economic and political destabilization.<sup>123</sup> Revising SC-GHG values to consider only domestic impacts without modifying the IAMs violates the expert recommendations of the National Academies: “Estimation of the net damages per ton of [GHG] emissions to the United States alone, beyond the approximations done by the IWG, is feasible in principle; however it is limited by the existing SC-IAM methodologies, which focus primarily on global estimates and do not model all relevant interactions among regions.”<sup>124</sup>

Use of a “domestic perspective” to calculate the SC-CH<sub>4</sub> is unjustified and inappropriate.

The “interim domestic” SC-CH<sub>4</sub> is inconsistent with the OMB Circular A-4’s guidance that analysis “should focus on benefits and costs that accrue to citizens and residents of the United States,” and “where . . . a regulation that is likely to have effects beyond the borders of the United States, these effects should be reported separately.”<sup>125</sup> GHGs

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<sup>119</sup> Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, Feb. 2010, *available at* [https://www.epa.gov/sites/production/files/2016-12/documents/scc\\_tsd\\_2010.pdf](https://www.epa.gov/sites/production/files/2016-12/documents/scc_tsd_2010.pdf).

<sup>120</sup> *Id.* at 11.

<sup>121</sup> *Ibid.*

<sup>122</sup> National Academies.

<sup>123</sup> *Ibid.*

<sup>124</sup> *Id.* at 12.

<sup>125</sup> OMB Circular A-4, *but see California v. Bureau of Land Management*, 286 F.Supp.3d 1054, 1069-70 (N.D. Cal. 2018) (citing Circular A-4, along with Executive Order 13783, as a factual basis for the use of a domestic social cost of methane).

create important impacts to the United States and U.S. citizens that do not stop at the U.S. border. These include impacts to U.S. citizens, including U.S. military service members, who live abroad and/or have significant investments abroad. The “interim domestic” SC-CH<sub>4</sub> also ignores impacts to national security through potential impacts to trade flows and global commodity markets. The Defense Authorization Act of 2018 acknowledges the global impacts of climate change, including some of the ways in which foreign impacts impose domestic costs, such as sea level rise that threatens U.S. military sites abroad and drought and famine that lead to failed states, “which are breeding grounds of extremist and terrorist organizations.”<sup>126</sup> The National Academies agree:

It is important to consider what constitutes a domestic impact in the case of a global pollutant that could have international implications that impact the United States. More thoroughly estimating a domestic SC-CO<sub>2</sub> would therefore need to consider the potential implications of climate impacts on, and actions by, other countries, which also have impacts on the United States.<sup>127</sup>

Because these impacts are not included in the domestic SC-CO<sub>2</sub> or SC-CH<sub>4</sub>, these values likely underestimate the true cost to the United States.

If the global SC-CH<sub>4</sub> is used in place of the domestic SC-CH<sub>4</sub>, the adverse climate impacts would offset a much larger portion of compliance cost savings of the proposed rule, as demonstrated using supplementary data provided in the 2018 RIA, compiled in Table 1 below.<sup>128</sup> This accounting, along with proper quantification of other costs of the proposal (described in the next section) would substantially change the cost benefit analysis.

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<sup>126</sup> Public Law 115-91, December 12, 2017, 131 Stat. 1283, § 335.

<sup>127</sup> National Academies, Conclusion 2-4. The social costs of methane have the same considerations as the social cost of carbon.

<sup>128</sup> Proposal RIA, Benefits and Tables OOOOa Reconsideration, Tabs “Option 1”, “Option 2”, “Option 3,” Docket ID No. EPA-HQ-OAR-2017-0483-0082, *available at* <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2017-0483-0082&attachmentNumber=1&contentType=excel12book>.

**Table 1. Comparison of benefits and costs for Option 3 using the domestic versus global SC-CH<sub>4</sub><sup>129</sup>**

<b>Analysis Item</b>	<b>7% discount rate</b>	<b>3% discount rate</b>
Cost Savings to Industry	\$380	\$484
Costs - Forgone Domestic Climate Benefits	\$13.5	\$53.5
Costs - Forgone Global Climate Benefits <sup>130</sup>	\$89.3	\$420.9
Net Benefits Using Domestic SC-CH <sub>4</sub>	\$367	\$431
Net Benefits Using Global SC-CH <sub>4</sub>	\$291	\$63

Further, the 2018 RIA acknowledges that the SC-CH<sub>4</sub> does not account for all potential harms and costs, including, for example, “direct health and welfare impacts associated with tropospheric ozone production by methane,” and U.S. EPA does not account for them in any other way.<sup>131</sup> These health impacts could adversely affect individuals in the United States, resulting in multiple costs for hospitalizations and emergency room visits, which ultimately could impose new costs on individuals, private businesses who employ these workers, private insurance companies, and government agencies who provide health services. Excluding these costs results in an incomplete and biased cost-benefit analysis.

Considering discount rates of only 3 and 7 percent is inappropriate.

The RIA for the proposed amendments incorporates only two discount rates (3 and 7 percent), which it incorrectly asserts complies with OMB Circular A-4, and applies them inconsistently. Circular A-4 suggests that utilizing discount rates of 3 and 7 percent is likely appropriate, at minimum and in general. However, regarding costs and benefits that arise across generations – the type of intergenerational discounting at play in analysis and consideration of climate impacts – Circular A-4 suggests that discount

<sup>129</sup> *Id.* at Tab “Option 3.” All data are taken directly from the Proposal RIA supporting data.

<sup>130</sup> This does not include potentially significant additional costs that were not quantified, as described below.

<sup>131</sup> Proposal RIA, Section 3.3.

rates ranging from 1 to 3 percent are more appropriate.<sup>132</sup> U.S. EPA's choice to examine discount rates of only 3 and 7 percent is also contrary to IWG recommendations, which utilize 2.5, 3, and 5 percent discount rates.<sup>133</sup>

The SC-CH<sub>4</sub> is highly sensitive to discount rates. Higher discount rates decrease the value today of future environmental damages. The analysis should follow the IWG SC-CO<sub>2</sub> and present results for the three discount rates of 2.5, 3, and 5 percent to represent varying valuation of future damages. These rates are based on peer-reviewed expert input. The value today of environmental damages in the future is higher under the 2.5 discount rates compared to the 3 or 5 percent rates, reflecting the trade-off of consumption today and future damages. The IWG estimates and presents results for the SC-CO<sub>2</sub> across the 2.5, 3, and 5 percent discount rates that encompass a variety of assumptions regarding the correlation between climate damages and consumption of goods and are consistent with Circular A-4.

Further, the 3 and 7 percent estimates included in OMB Circular A-4 represent the before-tax rate of return to private capital and are not appropriate as the central estimates for an intergenerational valuation of the willingness-to-pay to avoid environmental damages, as the SC-CH<sub>4</sub> represents. The SC-CH<sub>4</sub> does not represent a 'private return to capital' and therefore the application of the 3 and 7 percent discount rates alone is inappropriate.

The 3 and 7 percent discount rates are also not in line with scientific or economic consensus. In a forthcoming peer-reviewed report, researchers surveyed 197 experts on the long-term social discount rates.<sup>134</sup> While there was much variation, the median preferred social discount rate is 2 percent, and 92 percent of experts surveyed preferred a social discount rate between 1 and 3 percent, lower than the lower of the two discount rates that U.S. EPA's analysis applies.<sup>135</sup>

In inaccurately purporting to follow the directive of Circular A-4 by applying the 3 and 7 percent discount rates, U.S. EPA's analysis does not even apply these two discount rates consistently. At least four tables provided in the proposal and RIA apply only the 7 percent discount rate and omit the 3 percent discount rate without explanation or justification.<sup>136</sup>

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<sup>132</sup> OMB Circular A-4.

<sup>133</sup> IWG Addendum.

<sup>134</sup> Drupp, Moritz, et al., Discounting Disentangled, *American Economic Journal: Economic Policy*, 10 (4): 109-34, 2018, available at <https://www.aeaweb.org/articles?id=10.1257/pol.20160240&&from=f>.

<sup>135</sup> *Ibid.*

<sup>136</sup> 83 Fed. Reg. at 52,089, Table 4; Proposal RIA, Tables 1-3, 2-15, 2-16.

Potential updates to the best available science all point towards a higher, not lower, social cost of carbon.

It is critical to update estimates of climate damages as the science and economic understanding of climate change and its impact improve over time. There is an active discussion within government and academia about the role of SC-GHGs in assessing regulations, quantifying avoided climate damages, and the values themselves. Recent peer-reviewed research suggests that the IWG SC-GHG estimates on sector-specific impacts may be too low as economic and scientific modeling have progressed over time and new data has been incorporated into IAMs. A 2017 report published in *Nature Communications* presented new damage functions based on current scientific literature and estimate that the agricultural impacts as estimated in the IWG SC-CO<sub>2</sub> are too low.<sup>137</sup> The report finds that the impacts in the agricultural sector increase from a net benefit of \$2.7 a tonne under the IWG SC-CO<sub>2</sub> to a net cost of \$8.50 per tonne using the latest available science. This update alone of the agricultural impacts would cause the total IWG SC-CO<sub>2</sub> to more than double.

A 2018 working paper from the University of Chicago used subnational data from 41 countries to improve the estimation of mortality impacts due within the IWG SC-CO<sub>2</sub>. The updated median willingness-to-pay to avoid excess mortality from warming could increase the IWG SC-CO<sub>2</sub> by up to \$39 per tonne.<sup>138</sup> These recent findings point to the IWG SC-GHG estimates as too low and that an updated estimate based on peer-reviewed science would be higher than the IWG values.

U.S. EPA failed to quantify other costs of the proposed amendments.

Besides the adverse climate impacts described above, U.S. EPA fails to quantify multiple harms that represent significant costs to individuals, private businesses, and government agencies in the United States. By relaxing NSPS requirements, the proposed amendments would result in financial savings to industry at the expense of increased emissions of methane, VOCs, and hazardous air pollutants (HAP).<sup>139</sup> These emissions increases result in health, environmental, and welfare harms that represent new costs to individuals, businesses, and government agencies in the United States. The RIA for the proposed amendments identifies and quantifies all financial benefits to the oil and gas industry, including new compliance cost savings not previously identified, but does not quantify the harms associated with emissions increases. These

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<sup>137</sup> Moore, Frances, et al., New Science of Climate Change Impacts on Agriculture Implies Higher Social Cost of Carbon, *Nature Communications*, Volume 8, Article number 1607, 2017, available at <https://www.nature.com/articles/s41467-017-01792-x>.

<sup>138</sup> Carleton, Tamma, et al., Valuing the Global Mortality Consequences of Climate Change Accounting for Adaptation Costs and Benefits, August 2018, available at [https://bfi.uchicago.edu/sites/default/files/file\\_uploads/WP\\_2018-51\\_0.pdf](https://bfi.uchicago.edu/sites/default/files/file_uploads/WP_2018-51_0.pdf).

<sup>139</sup> Proposal RIA.

costs, if quantified, could easily outweigh the benefits described in the Proposed Amendments RIA. Their exclusion creates a biased analysis.

In particular, the costs associated with adverse health and environmental outcomes due to increased emissions and exposures to VOCs, HAPs, particulate matter (PM), and ozone are omitted. The proposed NSPS amendments, if finalized, would cause a significant increase in VOC emissions, which are a precursor to both ozone and secondary particulate matter. In addition, the proposal would increase emissions of HAPs. These emissions increases could adversely impact the health of individuals and increase occupational exposure for workers, likely resulting in significant costs. These costs may be borne in various ways throughout society including by individuals, private businesses, private health insurance, or public funding of health programs.

In declining to quantify these impacts, U.S. EPA accurately notes that the NSPS RIA also discussed these impacts only qualitatively. In that case, the agency was contemplating public health and environmental benefits: VOC and HAP reductions resulting from the NSPS contribute to public health benefits, improve visibility, reduce adverse effects from particulate matter (PM) deposition, and reduce adverse vegetation and ecosystem effects.<sup>140</sup> Additionally, the NSPS RIA determined that methane reductions could decrease global background ozone levels, resulting in additional health benefits, which were acknowledged but were not quantified.<sup>141</sup> Additionally, U.S. EPA demonstrated that the primary methane benefits would outweigh the compliance costs.<sup>142</sup> For all of these reasons, it was reasonable for U.S. EPA to limit its efforts to quantify additional non-climate benefits in the NSPS RIA.

By contrast, U.S. EPA now proposes amendments that would increase the public health and environmental burden of methane, VOC, and HAPs pollution, for the primary purpose of increasing cost-effectiveness of the existing rule. However, U.S. EPA cannot logically determine that these proposed amendments are cost-effective without quantifying their costs. Where, as here, rulemaking is predicated on cost savings and cost-effectiveness, failure to quantify quantifiable costs of the rulemaking arguably amounts to “fail[ure] to consider an important aspect of the problem” in contravention of the Administrative Procedure Act.<sup>143</sup> Relatedly, U.S. EPA fails to acknowledge that it is proposing to *remove* protections from the books in this context: It analyzes the

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<sup>140</sup> Regulatory Impact Analysis of the Final Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, May 2016, Docket ID No. EPA-HQ-OAR-2010-0505-7630, Table 4-1.

<sup>141</sup> *Id.* at Section 4.3.

<sup>142</sup> *Id.* at p. 5-3.

<sup>143</sup> See *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983); see also *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1198 (9th Cir. 2008) (“Even if NHTSA may use a cost-benefit analysis to determine the “maximum feasible” fuel economy standard, it cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent standards.”).

purported issues as if they were abstract problems with a proposed rule, citing “foregone benefits,” rather than acknowledging that it is considering diluting a rule now in force based on these unproven concerns.

U.S. EPA’s attempt to justify its failure to quantify non-climate impacts by citing uncertainty about the location of future emission sources and the difficulty in modeling local air quality is unpersuasive. Some amount of uncertainty in forward-looking analyses always exists. To be compliant with the laws, Executive Orders, and policies described above, however, RIAs must address that uncertainty through the various quantitative methods available, especially where it concerns increased costs and adverse impacts on public health. A health impact analysis for PM and ozone is longstanding practice at U.S. EPA, and the methods are well-established. For example, another recent U.S. EPA RIA performed a similar analysis and found that rolling back existing regulatory protections would increase emissions that would cause thousands of premature deaths and other health impacts across the United States, resulting in billions of dollars of increased costs to individuals, businesses, and society.<sup>144</sup>

The costs associated with the health impacts caused by the proposed NSPS amendments are likely significant. Typical valuations for morbidity and mortality used by U.S. EPA can be found in Table 5-9 of the RIA for the 2012 PM National Ambient Air Quality Standards (NAAQS) revisions.<sup>145</sup> For each mortality, U.S. EPA estimates the value of a statistical life to be \$9.6 million dollars, and twelve other health outcomes valued by U.S. EPA vary from \$68 to \$200,000 per incidence.<sup>146</sup> Even minimal impacts on public health because of the proposal could easily offset any benefits to businesses, and an analysis of these impacts are necessary.

There are multiple metrics that U.S. EPA commonly uses to investigate the potential range of health impacts and the resulting costs from its proposed actions, and which U.S. EPA can and should use here. Circular A-4 describes multiple approaches to bound the potential impacts of a regulation where there is uncertainty in one or more outcomes.<sup>147</sup> These approaches should be applied to the current proposal to better understand the potential value of health impacts and the costs to individuals and society.

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<sup>144</sup> Regulatory Impact Analysis for the Proposed Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guideline Implementing Regulations; Revisions to New Source Review Program, Aug. 2018, Docket ID No. EPA-HQ-OAR-2017-0355-21182.

<sup>145</sup> Regulatory Impact Analysis for the Final Revisions to the National Ambient Air Quality Standards for Particulate Matter, Dec. 2012 (Revised Feb. 28, 2013), Docket ID No. EPA-HQ-OAR-2007-0492-10094.

<sup>146</sup> *Id.* at Table 5-9.

<sup>147</sup> *E.g.*, OMB Circular A-4, p. 38.

Additionally, U.S. EPA experts in the Office of Air Quality Planning and Standards published a paper on this very topic in July, 2018, months before U.S. EPA proposed its NSPS amendments.<sup>148</sup> U.S. EPA should apply this research, entitled “Assessing Human Health PM<sub>2.5</sub> and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025,” to its proposed amendments and release a revised RIA for additional comment.

Besides health impacts, there likely would be additional costs as a result of the proposed amendments that have not been quantified or monetized. These include adverse outcomes such as impacts to ecosystems, vegetation, and visibility.

The RIA for the proposed NSPS amendments also does not quantify the governmental costs that result from the proposal. As a part of the Clean Air Act, the U.S. EPA sets NAAQS to protect public health. Many urban regions across the United States are in nonattainment for federal ozone and particulate matter NAAQS, meaning pollution levels are above limits the federal government deems safe, and states must implement programs, incentives, or regulations to reduce emissions. An increase in VOC emissions can increase ozone and particulate matter concentrations, which may make it more difficult for states to meet the federal standards. This may result in the need for states to develop new programs to address these emissions impacts. This would create new costs to plan, promulgate, implement, and enforce additional regulations, programs, and/or incentives that were not included in the RIA.

The RIA fails to analyze impacts on “sub-populations of particular concern.”

Circular A-4 states that RIAs should describe how “both benefits and costs are distributed among sub-populations of particular concern.”<sup>149</sup> Without quantifying the adverse health and environmental impacts likely to result from the proposed NSPS amendments, it is not possible to describe their distributional impacts. A number of sub-populations of particular concern are likely to be impacted by the proposed NSPS amendments. Air pollution is known to disproportionately impact multiple groups including children, elderly, those with pre-existing cardiopulmonary diseases and those with low socioeconomic standing.<sup>150</sup> As such, emissions increases may disproportionately harm these groups, and this impact was not analyzed.

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<sup>148</sup> Fann, Neal, et al., Assessing Human Health PM<sub>2.5</sub> and Ozone Impacts from U.S. Oil and Natural Gas Sector Emissions in 2025, *Environ. Sci. Technol.* 2018, 52, 8095–8103, July 13, 2018.

<sup>149</sup> OMB Circular A-4.

<sup>150</sup> *E.g.*, U.S. EPA, Integrated Science Assessment for Particulate Matter, EPA/600/R-08/139F, 2009, available at <https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=216546>.

*Impacts on Children*

E.O. 13045 and Circular A-4 require additional analyses in the case that a regulation could produce environmental health risks that disproportionately impact children.<sup>151</sup> E.O. 13045 requires Federal agencies to “make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children.”<sup>152</sup> In addition, E.O. 13045 requires each regulatory action to evaluate the environmental health or safety effects on children, and explain why the proposal is preferable to other potentially effective and reasonably feasible alternatives.<sup>153</sup>

U.S. EPA claims that the proposed action is not subject to E.O. 13045 because the proposed amendments would not impose disproportionate risk, but provides no evidence for this position.<sup>154</sup> Indeed, U.S. EPA asserts that the proposed amendments’ potential harm to children is unnecessary to evaluate because “the potential decrease in emission reduction (and thus the benefit) from the proposed amendment is minimal compared to the overall emission reduction that would continue to be achieved under the amended [NSPS].”<sup>155</sup> This is not the proper analysis: the proposed amendments are not a less-beneficial regulatory option to compare to the NSPS, but a new and separate deregulatory action with new and significant impacts. U.S. EPA is required to analyze these impacts by comparison to the status quo, not a period before the NSPS was promulgated.

Additionally, U.S. EPA claims that children will continue to be adequately protected by “existing NAAQS and other mechanisms in the CAA,”<sup>156</sup> ignoring both the impact of increased methane and VOC emissions on areas in non-attainment with NAAQS and U.S. EPA’s many concurrent efforts to undermine and avoid its other regulatory obligations.<sup>157</sup> The proposed NSPS amendments have the potential to cause environmental harm that disproportionately impacts children, and U.S. EPA has not met its obligation to analyze these impacts.

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<sup>151</sup> OMB Circular A-4, p. 44; E.O. 13045, April 21, 1997.

<sup>152</sup> E.O. 13045, April 21, 1997.

<sup>153</sup> *Ibid.*

<sup>154</sup> 83 Fed. Reg. at 52,090.

<sup>155</sup> *Ibid.*

<sup>156</sup> *Ibid.*

<sup>157</sup> *E.g.*, “Proposed Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks,” 83 Fed. Reg. 42,986 (Aug. 24, 2018); “Call for Information on Adverse Effects of Strategies for Attainment and Maintenance of National Ambient Air Quality Standards,” 83 Fed. Reg. 29,784 (June 26, 2018); Guidance Memorandum, “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act,” 83 Fed. Reg. 5,543 (Feb. 8, 2018); “Proposed Repeal of Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units,” 82 Fed. Reg. 48,035 (Oct. 16, 2017).

*Environmental Justice Impacts*

E.O. 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, requires additional analyses in the case that a regulation could produce environmental health risks with environmental justice impacts.<sup>158</sup> E.O. 12898 requires agencies to evaluate proposed actions for “disproportionately high and adverse human health or environmental effects on minority populations, low-income populations and/or indigenous peoples.”<sup>159</sup> Additionally, § 601 of Title VI of the Civil Rights Act of 1964 prohibits discrimination under covered programs and activities.<sup>160</sup> U.S. EPA claims that the proposed action is not subject to E.O. 12898 because the proposed amendments would not impose disproportionate risk, but it provides no evidence for this position.<sup>161</sup> U.S. EPA also asserts that the proposed amendments’ potential harm to marginalized populations is unnecessary to evaluate because “the potential decrease in emission reduction (and thus the benefit) from the proposed amendment is minimal compared to the overall emission reduction that would continue to be achieved under the amended [NSPS].”<sup>162</sup> As above, this is not the proper analysis: the proposed amendments are not a less-beneficial regulatory option to compare to the NSPS, but a new and separate deregulatory action with new and significant impacts. U.S. EPA is required to analyze these impacts by comparison to the status quo, not a period before the NSPS was promulgated.

Additionally, U.S. EPA claims that these populations will continue to be adequately protected by “existing NAAQS and other mechanisms in the CAA,”<sup>163</sup> ignoring both the impact of increased methane and VOC emissions on areas in non-attainment with NAAQS and U.S. EPA’s many concurrent efforts to undermine and avoid its other regulatory obligations.<sup>164</sup> The proposed NSPS amendments have the potential to cause environmental harm that disproportionately impacts environmental justice communities, and U.S. EPA must perform an analysis of these impacts.

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<sup>158</sup> E.O. 12898, Feb. 11, 1994.

<sup>159</sup> *Ibid.*

<sup>160</sup> *But see Alexander v. Sandoval*, 532 U.S. 275 (2001) (private right of action to enforce § 601 is limited to intentional discrimination).

<sup>161</sup> 83 Fed. Reg. at 52,090.

<sup>162</sup> *Ibid.*

<sup>163</sup> *Ibid.*

<sup>164</sup> *E.g.*, “Proposed Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks,” 83 Fed. Reg. 42986 (Aug. 24, 2018); “Call for Information on Adverse Effects of Strategies for Attainment and Maintenance of National Ambient Air Quality Standards,” 83 Fed. Reg. 29,784 (June 26, 2018); Guidance Memorandum, “Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act,” 83 Fed. Reg. 5,543 (Feb. 8, 2018); “Proposed Repeal of Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units,” 82 Fed. Reg. 48,035 (Oct. 16, 2017).

### Time Horizon

The time horizon for the economic analysis is a mere 6 years (2019-2025).<sup>165</sup> This may not fully capture the harms of the proposed regulation, which increase over time. The RIA for the proposed amendments shows that emissions of methane, VOCs, and HAPs increase linearly over the analysis period,<sup>166</sup> and this presumably would continue into future years (increasing the overall costs of the amendments).

The RIA for the proposed amendments states that while “it is desirable to analyze impacts beyond 2025,” uncertainty precludes this analysis.<sup>167</sup> This argument is not compelling, as a sensitivity of potential impacts could be bounded using various assumptions. Uncertainty in future impacts is routinely projected using likely low to high range, or likely scenarios, of input variables. A well-known example of this approach is used in projecting future global temperature change in Intergovernmental Panel on Climate Change reports.<sup>168</sup>

### Competitiveness

The RIA for the proposed amendments notes that since the NSPS was finalized, some states and locales have adopted oil and gas regulations that are expected to achieve similar emission reductions.<sup>169</sup> However, U.S. EPA provides no analysis of the effect that its proposed amendments may have on the competitiveness of businesses operating in states that will now have more stringent requirements than the revised national baseline. E.O. 12866 requires an analysis of the costs that may impact “efficient functioning of the economy, private markets (including productivity, employment, and competitiveness), health, safety, and the natural environment.”<sup>170</sup> U.S. EPA’s refusal to consider competitiveness concerns fails to meet these requirements.

### **Conclusion**

CARB reiterates its support of U.S. EPA's 2016 Oil and Gas New Source Performance Standards for New, Reconstructed, and Modified Sources, and cautions U.S. EPA that its proposal to weaken this standard is illegal, inappropriate, and contrary to its Clean Air Act obligations to protect public health and welfare.

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<sup>165</sup> Proposal RIA at 2-23.

<sup>166</sup> *Id.* at Table 2-3.

<sup>167</sup> *Id.* at 2-9.

<sup>168</sup> *E.g.*, IPCC, Special Report on Global Warming of 1.5°C, 2018, figure SPM.1(a), available at [https://report.ipcc.ch/sr15/pdf/sr15\\_spm\\_final.pdf](https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf).

<sup>169</sup> Proposal RIA at 1-4.

<sup>170</sup> E.O. 12866, “Regulatory Planning and Review,” Sept. 30, 1993.