

D I A L O G U E

U.S. AND GLOBAL METHANE REGULATION

SUMMARY

Methane is estimated to be responsible for one-third of the global rise in temperatures from greenhouse gases; it is shorter-lived but much more potent than carbon dioxide. The United States and the European Union (E.U.) launched the Global Methane Pledge at the 2021 United Nations Climate Change Conference (COP26). At COP28's Global Methane Pledge Ministerial last December, new strategies were announced, including the E.U.'s first-ever adoption of methane regulations and a final rule by the U.S. Environmental Protection Agency to reduce methane from the oil and gas industry. On January 31, 2024, the Environmental Law Institute hosted a panel of experts to analyze these regulations, discuss strategies other countries are employing to reduce emissions, and consider whether these efforts will meet 2030 goals. Below, we present a transcript of that discussion, which has been edited for style, clarity, and space considerations.

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Barry Rabe: I want to begin by offering a few overarching comments. It's so interesting to think about the issue of methane and its evolution as an environmental and climate policy issue, especially in recent years. If one examines media coverage in the United States and globally on climate change, or if one looks at published scholarship and the policy sciences and the social sciences, until recently it had been very easy to assume that all of climate change involved only carbon dioxide (CO₂). Yet, that has really changed in important and significant ways, as was particularly evident during the recent Conference of the Parties (COP) meetings.¹

At COP28, we heard about development of the Oil and Gas Decarbonization Charter,² and new developments

related to the relatively new global mechanisms to try to deal with methane, including the Global Methane Pledge.³ We also heard about new policy initiatives in the United States, the European Union (EU), and a number of other oil and gas producing countries, including such tools as performance standards, fees and taxes, and more precise measures of emissions disclosure. There's so much to weigh and think about as methane, particularly in the oil and gas sector, continues its move from relative obscurity to center stage in climate policy deliberations.

Also, an intriguing question for our panelists to consider and to each bring their own perspective on is: Can the new policies that are being proposed sub-federally and nationally in the United States and other nations around the world be formally adopted, implemented effectively, prove durable, and also deliver deep emission reduction that can be verified? Or do they struggle given technical, political, and legal issues?

Despite methane's growing visibility, it is hardly a new issue. Major oil and gas producing states, including Texas and North Dakota, devised initial policies involving regulation and taxation to curb methane venting and flaring many decades ago, largely over concern for waste of a non-renewable natural resource. But they rapidly backtracked on implementation in the face of withering industry resistance.⁴ Canada, Mexico, and other major oil and gas producing nations have faced similar challenges in moving

1. Barry G. Rabe, *Addressing Short-Lived Climate Pollutants After COP28*, BROOKINGS INST. (Jan. 23, 2024), <https://www.brookings.edu/articles/addressing-short-lived-climate-pollutants-after-cop28/>.

2. COP28, *Oil & Gas Decarbonization Charter Launched to Accelerate Climate Action*, <https://www.cop28.com/en/news/2023/12/Oil-Gas-Decarbonization-Charter-launched-to-accelerate-climate-action> (last visited Mar. 20, 2024).

3. Global Methane Pledge, *Home Page*, <https://www.globalmethanepledge.org/> (last visited Mar. 20, 2024).

4. Barry G. Rabe, *The Politics of Short-Lived Climate Pollutants and North American Methane Policy*, N. AM. COLLOQUIUM (Apr. 8, 2022), https://fordschool.umich.edu/sites/default/files/2022-04/NACP_Rabe_final.pdf.

beyond initial methane policy pronouncements into actual and effective implementation.⁵

So, this question of how we design methane policy is an intriguing one to weigh and consider—not only creating such a policy in the first place, but making it durable and producing evidence that it is effective. In turn, we should ask whether the United States is now prepared to assume a position of global leadership and will establish a model for other nations, or instead will continue to struggle in delivery.

Finally, I note that while methane, CH₄, plays such a large role in current levels of global warming, I do wonder why so much of our focus in terms of policy discussion is on methane that comes from the oil and gas sector, but we see far less engagement and perhaps progress when talking about other key sectors, including coal, landfills, agriculture, or livestock. Alongside our primary focus today on the oil and gas sector, I would encourage us to begin to think about some of these larger issues. Are there any takeaways from what we're seeing in oil and gas that could ultimately move us forward in those other sectors?

I'm delighted to turn to our group of panelists, for whom I'll provide a brief introduction. First, we're pleased to welcome Tomás Carbonell, deputy assistant administrator for stationary sources at the Office of Air and Radiation within the U.S. Environmental Protection Agency (EPA). Prior to joining EPA, Tomás served as an attorney in the Clean Air Program at the Environmental Defense Fund (EDF). Prior to that, he worked with Van Ness Feldman on a range of energy and environmental policy legal issues.

Tomás Carbonell: I'm pleased to have this opportunity to speak with you today about the work that we're doing in the Office of Air and Radiation to reduce methane emissions, particularly from the oil and natural gas sector. As you know, methane is a really potent climate pollutant that EPA estimates is responsible for about one-third of the global warming we're now experiencing.⁶ Controlling methane also comes with a range of other benefits, including reductions in health-harming pollutants that are often emitted with methane as well as the conservation of valuable energy resources.

The Joseph Biden-Kamala Harris Administration sees reducing methane emissions as an urgent priority as well as a major opportunity not just to achieve near-term climate progress, but also to protect public health, advance energy security, and generate economic benefits. Under this Administration, the United States has been taking bold regulatory actions in mobilizing resources to support ambitious global efforts on methane, including the Global Methane Pledge commitment that Barry mentioned in the

opening remarks, to reduce methane collectively by 30% from 2020 levels by 2030. EPA's work to achieve reductions in methane from the oil and natural gas sector is the cornerstone of U.S. efforts, because the oil and natural gas sector is the largest industrial source of methane emissions in the United States.

Over the past three years, we've been pursuing multiple steps under the Clean Air Act (CAA)⁷ and under the U.S. Congress' direction in the Inflation Reduction Act (IRA)⁸ to secure significant reductions in methane emissions from oil and natural gas operations. That work began in November 2021, when EPA proposed regulations under §111 of the CAA to reduce methane emissions from new and existing oil and natural gas operations.⁹ We recently issued a final rule, announced at COP28, that will sharply reduce methane emissions from these facilities.¹⁰

Then, in the IRA, which was signed into law in August 2022, Congress recognized and embraced this CAA rule-making and built a three-part framework of additional measures known as the Methane Emissions Reduction Program¹¹—or, as we affectionately call it, the MERP—to complement the CAA regulations and ensure further reductions in methane from this sector. The MERP includes more than \$1 billion in financial and technical assistance to support methane mitigation and monitoring from oil and gas operations. It includes a directive to EPA to update and improve methane emissions reporting requirements for oil and gas facilities. It also includes the Waste Emissions Charge (WEC) to incentivize reductions in methane emissions from high-emitting oil and gas facilities.

Together, these efforts are meant to reinforce and complement each other. They also, we believe, strengthen U.S. leadership in methane reduction from this industry. As I'll describe, EPA is really poised to support U.S. leadership in this area, through our partnerships and through our work internationally to provide technical assistance and to share some of the lessons learned from our own experience. I'll say a bit more about each of these prongs of EPA's work, starting with our work under the CAA to establish new regulations for methane from oil and natural gas operations.

On the regulatory front, the CAA rule that EPA finalized in December of last year will significantly reduce emissions of methane and other harmful air pollution from oil and natural gas operations, including from existing sources nationwide for the first time. There are essentially two major components to the final rule. First, it includes what we call new source performance standards under §111(b)

5. Barry G. Rabe et al., *Taxing Flaring and the Politics of State Methane Policy*, 37 REV. POL'Y RSCH. 6 (2020).

6. Intergovernmental Panel on Climate Change (IPCC), *Summary for Policymakers*, in CLIMATE CHANGE 2023: SYNTHESIS REPORT. CONTRIBUTION OF WORKING GROUPS I, II AND III TO THE SIXTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (Hoesung Lee & José Romero eds., 2023), https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf.

7. 42 U.S.C. §§7401-7671q, ELR STAT. CAA §§101-618.

8. Inflation Reduction Act of 2022, Pub. L. No. 117-169, 136 Stat. 1818.

9. Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review, 86 Fed. Reg. 63110 (Nov. 15, 2021).

10. U.S. EPA, *EPA's Final Rule for Oil and Natural Gas Operations Will Sharply Reduce Methane and Other Harmful Pollution*, <https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-operations/epas-final-rule-oil-and-natural-gas> (last updated Mar. 19, 2024).

11. U.S. EPA, *Methane Emissions Reduction Program*, <https://www.epa.gov/inflation-reduction-act/methane-emissions-reduction-program> (last updated Mar. 14, 2024).

of the CAA to limit emissions of methane and small-forming volatile organic compounds from new and modified and reconstructed sources in the oil and natural gas sector. Second, it includes what we call emission guidelines under §111(d) of the CAA, which essentially require states to develop and implement plans to limit methane emissions from existing sources across the country.

Taken together, the standards and guidelines in this final rule comprehensively address the most significant sources of methane at new and existing oil and natural gas facilities. The standards draw from and build on proven and cost-effective solutions that leading oil- and gas-producing companies and states are using and have committed to use to reduce this harmful pollution.

Looking at the features of the rule, among other things, the standards require owners and operators to minimize or avoid methane emissions from equipment like process controllers, pumps, storage vessels, and compressors. The rule includes a requirement that owners and operators phase out over a two-year period the routine flaring of natural gas from new oil wells. It also includes requirements that owners and operators regularly monitor wells, compressor stations, and centralized production facilities for leaks and to repair any leaks found.

One thing we're very excited about is that the rule recognizes we are living through a period of incredible innovation when it comes to technologies for finding and reducing methane emissions—everything from new satellite technologies to aerial monitoring technologies to continuous monitoring technologies. We crafted the final rule to support and incorporate those technologies and to remain relevant and keep up with the pace of innovation over time. The rule allows owners and operators to use advanced technologies to meet requirements to monitor for leaks, including the technologies that I mentioned. It also creates a pathway for owners and operators to use new innovative technologies as they develop while still meeting the rule's requirements.

Another exciting feature of the rule is that it includes what we call the Super-Emitter Program, which leverages data collected by expert EPA-certified third parties to identify and remedy large leaks and releases that are responsible for as much as half of the methane emissions from oil and natural gas operations. We got a lot of feedback on our proposed rule in connection with the Super-Emitter Program. We made some important changes in the final rule that provide a strong oversight role for EPA in that program, to ensure that operators and the public have a high degree of confidence in the data that's being used and that the program operates with a high degree of transparency.

This final rule reflects more than one million comments that we received from a wide variety of stakeholders, including states, tribal nations, oil and gas companies, frontline communities, and environmental and public health non-governmental organizations. We really think that the final package incorporates and reflects that input to arrive at a final set of requirements that will deliver significant climate and public health benefits and that is also feasible and cost effective to implement.

To review some of those benefits, the final rule is expected to avoid an estimated 58 million tons of methane emissions from 2024 to 2038. That's a nearly 80% reduction compared to what emissions would be without the rule. To put those reductions in perspective, in 2030 alone the rule would achieve reductions in methane that are equivalent to the annual emissions of 28 million gasoline-powered cars.

In addition to those climate benefits, the rule will also achieve significant reductions in ozone-forming pollution that will have long-lasting benefits for public health, and will prevent up to 97,000 cases of asthma and 35,000 lost school days a year. We estimate that those climate and health benefits will be up to \$98 billion from 2024 to 2038, or about \$7 billion per year. And that's net benefits after accounting for the cost of compliance. In addition, the rule will achieve significant recovery of natural gas that would otherwise have been emitted to the atmosphere—enough to heat nearly eight million homes for the winter.

As I mentioned, the CAA rule that I've just described is only one part of what EPA has been doing to achieve reductions in methane from the oil and natural gas sector. I'll now provide more details on some of the programs that Congress included in the IRA and that we are also working to implement to go hand-in-hand with these new CAA protections.

The first is an important financial and technical assistance program under which Congress provided more than \$1 billion to accelerate the transition to no- and low-emitting oil and gas technologies, as well as to support methane monitoring and mitigation more broadly. EPA is partnering with the U.S. Department of Energy (DOE) to administer this funding. Just last year, we announced that the first round of funding, which is going to be distributed in the form of formula grants to states, had been awarded to 14 states. That was a total of \$350 million in funding that will be distributed by states to help oil and gas well owners and operators voluntarily and permanently reduce methane emissions from low-producing conventional wells.

As a follow-up to that, we are planning a second round of grants that will be distributed in the form of a competitive opportunity and that we expect to be opened in the coming weeks. That competitive grant opportunity is intended to make funds available to a variety of stakeholders for mitigating and monitoring methane emissions, not just from low-producing wells, but other oil and natural gas operations as well and related activities.

A second piece of the three-part framework that Congress included in the IRA relates to methane emissions reporting from oil and natural gas operations as required by Congress in the Act. Last August, EPA proposed changes to what we call Subpart W of our Greenhouse Gas Reporting Program.¹² These are regulations that require owners and operators of oil and natural gas facilities to report their

12. Greenhouse Gas Reporting Rule: Revisions and Confidentiality Determinations for Petroleum and Natural Gas Systems, 88 Fed. Reg. 50282 (Aug. 1, 2023).

methane emissions on an annual basis and that have been in place for some years.

The proposed revisions that we're making under the IRA would improve the accuracy of reported emissions of methane, which not only will support implementation of the WEC—which I'll say more about in just a minute—but also will enable the public to better track progress in reducing emissions for oil and natural gas operations.¹³ Some of the things included in the proposal include requirements to report methane from certain sources that are not currently covered under our existing Subpart W regulations.

We proposed updates to certain reporting methods to reflect the latest available data on oil and gas facilities and their emissions. We proposed new pathways for oil and gas facilities to report emissions that are based on empirical data, including through the use of advanced monitoring technologies. We're currently working through and reviewing comments on that proposal, and intend to finalize the revisions later this year, ahead of an August 2024 deadline that was included in the IRA, so that companies can begin implementing changes to their methane reporting practices starting in 2025.

The last piece of the IRA I want to discuss is the WEC. In the IRA, Congress directed EPA to collect the charge on wasteful emissions of natural gas from large oil and gas facilities that exceed certain emission thresholds that are specified in the Act. The WEC is intended to encourage the early deployment of available technologies and best practices to reduce methane emissions and other harmful pollutants while new CAA standards are taking effect.

Earlier this month, we announced a proposed rule to implement the WEC.¹⁴ Among other things, that proposed rule addresses how oil and gas companies would calculate the WEC based on their emissions, and clarifies how companies can use flexibilities and exemptions that Congress provided in the statute. This includes an exemption from the charge for facilities that are subject to and in compliance with the new CAA rules as well as provisions that allow multiple facilities that are owned by the same entity to net their emissions, and thereby reduce their WEC obligations.

Those are the three IRA-related pieces that are designed by Congress to work together with the CAA rules to ensure near-term reductions in harmful emissions. We think that, as a package, the set of measures EPA is working to implement will advance the adoption of clean and cost-effective technologies, reduce wasteful practices, and yield a range of economic and public health and climate benefits.

That brings me to the last topic, which is that, in addition to all the domestic benefits, these actions really reinforce U.S. leadership in efficiency, and improved per-

formance of oil and gas operations, as well as the development and deployment of innovative technologies and practices. EPA is poised to support that leadership through long-standing international partnerships that allow us to utilize the lessons and experience that we gained through our own domestic regulatory and voluntary efforts to support global action.

For many years, EPA has been partnering with the international community to share lessons learned on methane mitigation through the Global Methane Initiative (GMI).¹⁵ Through GMI, we have worked with about 49 country partners and hundreds of private-sector partners to provide training and technical expertise and analysis to support ambitious methane action not just in the energy sector, but also the waste and biogas sectors. That long-standing effort has only become more urgent and relevant. As we've seen, methane has really taken center stage in the global climate discussion as countries have ramped up their commitments to address methane. Obviously, the Global Methane Pledge was an important step in that evolution. A total of 155 countries have now joined the pledge to date, representing about 50% of man-made methane emissions globally.

One thing that's really encouraging to see is that, along with those commitments through the pledge, we are seeing major players step up to announce public commitments and actions to reduce methane. In November of last year, the EU agreed on its first-ever methane regulations, which include monitoring and abatement criteria for domestically produced and imported fossil oil, gas, and coal, and a plan to establish a methane import standard by 2030.

Also in November, China published a methane action plan. The United States and China reaffirmed their commitments to share information on technical solutions and to cooperate on capacity-building and policy discussions. Then at the COP in December, the United States, China, and the United Arab Emirates convened a summit on methane and other non-CO₂ greenhouse gases, where governments and philanthropies and the private sector joined together to announce more than \$1 billion in new grant funding for methane reduction, which more than triples current annual grant funding and will leverage billions of dollars of product investment in methane reduction. Barry mentioned the Oil and Gas Decarbonization Charter that was also announced at COP28, in which 50 companies responsible for 40% of global oil production committed to limiting methane pollution to 0.2% of their production operations by 2030 and to achieve net-zero operations by 2050 along with a set of specific measures to help reach those goals.

These are very exciting developments that reflect the evolution of methane as an urgent priority internationally. They are also part of a pattern that we're seeing in which actions and commitments are being taken within individual countries, including the United States, which is helping encourage actions at the international level.

13. See Patrick Reilly, *Fighting Methane Emissions With the False Claims Act*, 53 ELR 10814 (Nov. 2023), <https://www.elr.info/articles/elr-articles/fighting-methane-emissions-false-claims-act>.

14. News Release, U.S. EPA, Biden-Harris Administration Announces Proposed Rule to Reduce Wasteful Methane Emissions From the Oil and Gas Sector to Drive Innovation and Protect Communities (Jan. 12, 2024), <https://epa.gov/newsreleases/biden-harris-administration-announces-proposed-rule-reduce-wasteful-methane-emissions>.

15. GMI, *Home Page*, <https://www.globalmethane.org/> (last visited Mar. 20, 2024).

Barry Rabe: Thanks for taking us through the suite of different policy approaches that the federal government is pursuing as well as bringing in some of the international component.

I'm pleased to turn to Kyle Danish, who is a partner at Van Ness Feldman and a leader in the firm's energy transition practice. He is also a senior associate nonresident at the Center for Strategic and International Studies in their Energy Security and Climate Change Program. He serves on the editorial board of the *Carbon and Climate Law Review*, and has widespread legal and policy experience cutting across issues of climate, energy, and the environment.

Kyle Danish: I'm going to pick up where Tomás left off in his very clear description and summary of the suite of federal methane policies. I'm going to talk about some of the legal and compliance issues with those rules and policies, covering the sort of conversations I'm having with clients and others. I'm going to start with the CAA §111 rules, which include the new source performance standards for new oil and gas facilities and the emission guidelines for existing sources.

Deputy Assistant Administrator Carbonell brought up the Super-Emitter Program, which is clearly a very important element of those rules. This is the program by which the Agency is going to certify third parties that can extend the compliance assurance aspects of the rule by independently monitoring for super-emitter events through the use of satellites and other advanced measurement methods. Super-emitter events are the very large methane emission events that occur at oil and gas wells, compressor stations, and other facilities.

This program was a very controversial part of the proposed rule because, as formulated, these third-party monitoring entities were going to have a much more unmediated role in both identifying and publicly naming potential violators. I think it was a sort of independence and deputization that people felt might be stretching at the boundaries of the legal authority that the Agency has to delegate its powers.

In the final rule, the Agency took over more of this program so that Super-Emitter Program reports will go directly to EPA, and action will be assessed and taken by EPA. This approach puts the program back into a more confined box within the Agency's authorities to gather information from third-party sources. But I expect the legality of the Super-Emitter Program will be something that will be explored through the inevitable litigation that comes with EPA regulatory actions.

It may well be that more legal controversy applies not in the challenge to the underlying program, but in the case-by-case application of it. There may be disputes that arise when EPA uses information from a third-party entity to attribute specific responsibility for a large leak in a large oil and gas production basin, which is still pretty hard to do. These technologies are improving very rapidly, but to identify whose well within a basin was responsible for what could be a short-term but major event will still have some challenges. If the Agency is going to move forward to

enforce and hold entities responsible for violations on the basis of satellite-generated data, this will be an area where I expect there will be more disputes.

Deputy Administrator Carbonell also mentioned the integration of these advanced methane measurement methods in the rule, including allowing them to be used by regulated operators to meet their "leak detection and repair" (LDAR) obligations. This is one of the very innovative things that the Agency is doing in this rule. The technologies for monitoring and identifying methane emissions, while still evolving, are improving very rapidly. There are many reasons to believe that, in a lot of cases, they will work much better than what the Agency has identified as the underlying "best system" for detection of fugitive methane emissions, which primarily consists of a type of handheld camera called an optical gas imaging camera.

The abilities of satellites, aerial surveys, and continuous monitors to identify and sometimes measure leaks are expanding. Therefore, the Agency's establishment of a system to review and approve the use of these technologies by regulated operators will further the long-run objectives of the methane regulations. Many operators are already using these technologies in the field. The Agency has created an avenue that allows for the approval of these methods. Once approved, they can be used by any operator. EPA has created some basic criteria for approval in the final §111 rules.

Now, the question will be how long it will take for the Agency to work through the approval process, because there is great eagerness to use these methods as soon as possible, particularly for entities that have new facilities. For new facilities, LDAR surveys are a compliance obligation from day one. The final §111 rules provide that, if EPA takes more than 270 days to review a proposed method, operators may use the method on a conditional basis, which means that it can be used for compliance purposes unless and until the Agency rejects the technology. That is helpful, although it still puts operators at risk of investing in a compliance method that they may ultimately need to abandon. Therefore, I am not sure how many operators will take advantage of this provision.

Another factor to consider is that any approval of an advanced measurement method might also have to address how the method is used in specific basins or under specific weather conditions. Accordingly, much of the implementation of this part of the rules will turn on how these advanced methods are brought into play. In any event, I think the approval of advanced measurement methods is an important area to watch.

I also want to talk about the Subpart W reporting program and the WEC, because these two programs really do go together. The Subpart W program will essentially be the emissions accounting methodology that will be used for implementation of the WEC.

As I've looked at the way all these rules fit together, I think it's important to understand that what's going on with the WEC is somewhat different than the §111 rules. The §111 rules are mostly about replacing known leaky technology with better technology, phasing out routine

flaring, and putting in systems for LDAR. It's about chasing down leaks or avoiding them altogether.

At least on the face of it, the WEC program is aimed at measuring methane emissions all year long and determining whether the facility is above a specified annual threshold. I think that the Agency is in a challenging spot in implementing the WEC because, while advanced technologies are improving quite a bit, we don't have anything like we have, for example, in the electric power sector. Today, it is possible to obtain very precise and granular emissions data for a power plant by placing continuous monitors at the end of the stack.

That kind of granular, constant measurement seems to be what Congress was contemplating when it enacted the WEC provisions because these provisions institute a per-excess-ton charge, which implies a very accurate measurement of actual emissions. Congress even emphasized that measurement methods should be "empirical." Again, I think this puts EPA in a tough spot. In the Subpart W reporting provisions, the Agency still relies heavily on "emission factors," which are essentially across-the-board estimates for different types of facilities and components of facilities. If you have a particular type of component or technology at your facility, the emission factor approach says, we just assume it is emitting this much no matter what is actually happening at your facility and no matter what part of the country you're in.

These factors have been revised to be more conservative, because researchers found that the Agency was missing a lot of emissions. However, I think it is not ideal to impose a tax on an operator for every excess ton of emissions when the calculation of the operator's emissions relies substantially on estimations. I think the Agency missed an opportunity in its proposed Subpart W rule to make more use of the advanced measurement methods that are out there. Some of the methods, while still not perfect for calculating minute-by-minute facility-wide emissions, are getting quite good at identifying and measuring leaks at specific facility components.

Curiously, the Agency didn't integrate these advanced measurement methods into the Subpart W rule framework that will form the accounting backbone for the WEC, and instead opted to rely heavily on emission factors—even though EPA has approved their use under the §111 rules and even though Congress emphasized that EPA should use "empirical" approaches for the WEC. There's a chance, in the final version of the Subpart W rule, that the Agency may recalibrate to at least bring forward the use of some of these advanced methods. Then an operator could say: "Your emission factor assumed this amount of methane leakage, but I've had a continuous monitor facing that component for the whole year and it just didn't have a super-emitter event or have that level of leakage." That's something I'm looking for in the final version of the Subpart W rule.

The WEC implementation proposal that came out recently, as Deputy Assistant Administrator Carbonell pointed out, has some important exemptions in it that Congress created and that EPA has to interpret. One is the regulatory exemption that excuses a facility from the

WEC if the facility is in full compliance with the applicable §111 rules.

But the language in the statute, which I think EPA has interpreted appropriately, basically says this exemption is only available when the §111 rules are in effect in every state that has affected facilities. However, the Agency also has estimated that §111 rules will not fully be in place until sometime in 2027. The implication is that the WEC could apply all the way into 2027 before this exemption could be available.

Another concern that I have heard from facility operators is that EPA has proposed that the exemption should apply only if your facility is 100% in compliance with the applicable §111 rules. This may sound reasonable on its face, but it is very easy to end up with slight deviations from the requirements of the §111 rules, and these deviations could have minimal emission impacts.

Another thing to watch is how the Agency implements another feature of the WEC, which allows facilities under common ownership to "net" their emissions. The netting section in the statute provides that if you own a facility that may be in excess of the relevant threshold, you may net its emissions against another facility that you own that is below that threshold, thereby eliminating the exceedance and your liability for the fee. The Agency had to do a lot of interpretation of this netting provision in ways that I think ended up making it rather restrictive.

For example, the Agency has interpreted the requirement that the two facilities be under "common ownership and control" to mean that the same company is operating both facilities. However, the nature of this industry is that a lot of companies have multiple subsidiary business units that own and operate different facilities. Such companies would like to be able to roll up the netting concept to the parent company, thereby extending netting to a much larger group of facilities, even if those facilities are owned by different subsidiaries. That does not appear possible under EPA's proposed WEC implementation rule.

Another question is whether this suite of federal methane rules could be rolled back or reversed by a new president or Congress. We've seen that happen before. As I've thought through this and talked about it with people, it seems important to realize—again, without making any predictions—that the federal methane policies that we have described here are particularly well fortified.

First, even if you just look at the §111 rules, there is a pretty good record of Congress actually telling EPA it has to do these rules, which could complicate efforts by a new president to weaken or reverse them. Congress rolled back the Donald Trump EPA's effort to reverse the version of §111 rules promulgated under the Barack Obama Administration, and in doing so, Congress said they wanted EPA to develop rules that reach existing facilities.

Second, the IRA has created a redundancy that fortifies the §111 rules against action by a new president. If a new president rolled back the §111 rules or weakened them, the effect would be to remove the "regulatory exemption" under the WEC. One of Congress' conditions on the use of the WEC regulatory exemption is that the final §111

rules can be no less stringent than the version that EPA proposed back in November 2021. So, even weakening them increases the risk that operators are subject to the WEC in perpetuity.

Of course, there is a possibility that a new Congress will just change the law by removing the WEC altogether. However, it is important to realize that such a change in the law likely would require not only a sympathetic U.S. Senate and U.S. House of Representatives, but also a supportive president who would not veto the action. In the Senate, it might require a filibuster-proof majority, unless enacted through the budget reconciliation procedures.

For these reasons, I would say there is an unusual amount of stickiness to these methane policies. Could they be weakened? Could they be rolled back? Could they be changed in the courts? It's all possible. But of all the rules that are out there for attack, this suite of methane policies is relatively durable.

Barry Rabe: Thanks, Kyle, for providing context and a lot to think about with legal and compliance, and even political, issues as we ponder the United States bringing together these competing or even complementary policy tools to deal with the methane issue.

I'm pleased to turn to Isabel Mogstad, who currently leads BP's Policy and Federal Government Affairs Team and oversees BP's legislative and regulatory advocacy with the federal government. Prior to that, she served in various roles, including a number of years at EDF. She currently holds one of the more interesting titles I've heard in quite a while: a Millennium Fellow at the Atlantic Council.

Isabel Mogstad: I'm going to start with a couple of high-level reflections. We've heard a lot about the substantive details of the various policies and rules that are underway, principally at the domestic level in the United States. Tomás touched on international efforts, and I'll speak about those as well.

My goal for the next few minutes is to level-set from one industry perspective. Of course, there are going to be myriad and diverse perspectives within our industry on these various initiatives and how they come together, but I would offer that there are a couple of general themes that are converging in the policy space that are worth discussing going forward. I think it's worth level-setting on where we are with methane and how things are changing in this dynamic political environment.

Barry opened with a few reflections on the methane moment, and why now, and the significance of this topic on domestic and international stages. I would offer that natural gas has an important role to play in the energy transition. It provides an affordable, secure, lower-carbon source of an energy-dense alternative to other hydrocarbons. It has over the past several years contributed meaningfully to the United States' achievement of its greenhouse gas emissions reduction goals, and is doing so internationally as well. But ultimately, there's no question that unabated methane is really the Achilles' heel of natural gas. Some of the benefits

that are accrued to natural gas can be eroded if methane emissions are not only managed but minimized.

The other dynamic at play is that the United States recently has proposed and will finalize one of the strongest regulatory regimes for methane emissions globally. It not only aids the ability to maximize the climate advantages of natural gas as compared to other energy-dense alternatives, but makes sure that we're realizing the full benefits of the other positive attributes related to natural gas more broadly.

I mention this because we have this new political backdrop for the conversation today, which is important and ultimately shapes some of the conversations on the topic going forward: the recent announcement from the White House pausing the pending liquefied natural gas (LNG) export permits at DOE.¹⁶ I think that does impact and change the political landscape as we talk about the importance of reducing methane across the oil and gas sector and the ripple effects it has in global markets, in geopolitics and elsewhere, and how all of this ultimately converges.

There's been a bit of talk already about some of the progress that was made at COP28. I won't repeat the substance of the numerous initiatives and details that have already been laid out. I will note a couple of highlights that I think are particularly significant.

There was mention of the Oil and Gas Decarbonization Charter. Roughly 50 companies are covering 40% of oil and gas production globally, with a heavy tilt toward national oil companies as well as companies like BP and other publicly traded international oil companies. That charter is focused not only on sharing best practices, which is a key driver of change, but also on driving the industry toward net zero by 2050 or sooner. It's really geared toward the zeroing out of methane emissions from the sector altogether, eliminating routine flaring, and greater collaboration on technology, and best practice sharing to reduce emissions. Those types of initiatives are absolutely critical.

Similarly, COP28 also saw the launch of the new Global Flaring and Methane Reduction Partnership, which is housed at the World Bank.¹⁷ That is a \$250-million multi-donor trust fund that will aid particularly developing countries with grants and technical assistance, as well as policy and regulatory advisory services and mobilization of additional financing from governments and companies to help these industries help these countries drive down their methane emissions from the oil and gas sector as well.

It's important to know, with something like this new fund, that it's tied to similar programs that are going to keep everyone accountable to a high bar. That includes robust reporting and measuring of emissions to the Oil and Gas Methane Partnership 2.0, sort of a gold-standard

16. Fact Sheet, White House, Biden-Harris Administration Announces Temporary Pause on Pending Approvals of Liquefied Natural Gas Exports (Jan. 26, 2024), <https://www.whitehouse.gov/briefing-room/statements-releases/2024/01/26/fact-sheet-biden-harris-administration-announces-temporary-pause-on-pending-approvals-of-liquefied-natural-gas-exports/>.

17. World Bank, *Global Flaring and Methane Reduction Partnership (GFMR)*, <https://www.worldbank.org/en/programs/gasflaringreduction> (last visited Mar. 20, 2024).

framework for measuring and reporting emissions.¹⁸ Also, setting a goal of methane intensity of 0.20 by 2030 and continuing to keep the pressure on through the funding being contingent on zero routine flaring by 2030. We're seeing many of these numbers and many of these goals converge at the corporate ambition level.

We share many of these targets as well in the regulatory space, and now at these international initiatives. I would offer, as we think about where we go from here, that the vision is so important, but ultimately it's about implementation. 2030 is not that far away. Every year counts. So, with things like the Oil and Gas Decarbonization Charter, there's already work underway to formalize the frameworks and governance of that new charter to ensure that progress is being made quarter by quarter, not just in the run up to the next COP, but to achieve all of these ambitious goals by 2030.

I want to touch briefly on the regulatory side. We've heard a lot about the substance and details of the numerous rules that we have coming together in the United States. There are three themes that really stand out to me as we assess these rules piece by piece and how they're ultimately going to come together. One is timing. We've heard about the regulatory exemptions for the WEC. We're waiting for the final Subpart W, to inform how we calculate our emissions to inform the charge. We are waiting to see the final §111 rules in the *Federal Register* and what comes from there.

There is this open question about timing and how all of this comes together. When you're sitting in an operator seat thinking about long-term investment, having regulatory certainty is a key enabler and ingredient to investment decisionmaking. The timing and clarity that we need to inform our business decisions are key and something that we think about as all of these parts come together.

Along that line, I would offer the second key theme: harmonization. Kyle did a great job talking about how these rules mutually reinforce each other, or may in some instances create disincentives, but ultimately the goal is for these programs to harmonize in such a way that you have a streamlined methane reduction program in this country underpinned by well-designed policy and regulation. That's clear and predictable, and ultimately gives companies the signals and rules of the road to make decisions for the long term.

Finally, the third theme is globalization. This comes back to my comments at the beginning about our strong regulatory environment, the new developments with LNG. At the end of the day, in addition to the important environmental outcomes that most of these policies and regulations are intended to deliver, there is also an element of setting the U.S. natural gas industry up to be competitive for the long term.

We need our global partners to trust in the climate efficacy and attributes of U.S. domestic production, to have

confidence in the numbers and the data that we are putting out. So, when we were having these broader conversations about regulatory regimes in other countries, there's a recognition that what we are doing here is going to have significant implications for how we think about the role of U.S. natural gas in global markets and the importance of ensuring that global partners have confidence in and access to the robust and lower methane natural gas supplies that we have here.

Barry Rabe: Finally, I'd like to turn to Romina Picolotti, who is working extensively on a range of issues surrounding short-lived climate pollutants, including hydrofluorocarbons (HFCs), in Kigali Amendment implementation that includes the United States and 154 other nations in a very structured emissions reduction regime. She is the senior policy advisor for the Institute for Governance and Sustainable Development (IGSD), founder of the Center for Human Rights and Environment in Argentina, and formerly Secretary of Environment and Sustainable Development for Argentina.

Romina Picolotti: I will begin by reminding everybody why we're doing this, why methane is important. Methane is the second largest contributor to global warming after CO₂, responsible for nearly 45% of current net warming. Methane, unlike CO₂, is a short-lived climate pollutant. Therefore, cutting methane is the only way to slow the rate of warming in the near term.

There's robust science, including reports from the Intergovernmental Panel on Climate Change (IPCC), that confirms that without fast action to slow the rate of warming in the near term, warming will exceed the 1.5 degrees Celsius (°C) guardrail by the end of the current decade and 2°C by 2050. Therefore, if we are serious about tackling the climate emergency, we must reduce methane emissions. It is the single most effective strategy to keep within reach the goal of limiting warming to 1.5°C, limit overshoot, and at the same time, as other speakers said, improving public health and agricultural productivity.

Methane mitigation is also crucial to slow down tipping points and feedback loops. This is very important for resilience, for the communities that are more exposed to extreme weather events due to the climate emergency. There's a human face behind what we're doing on methane mitigation, and I think it's important to remind everybody about that. If you want to learn more, IGSD just released a Methane Primer, which you can download for free from our website.¹⁹

The Climate and Clean Air Coalition (CCAC), which is an institution hosted by the United Nations Environment Programme, put together the first global methane assessment, and calculated that a strategy to reduce methane emissions by 40% to 45% by 2030 could avoid nearly

18. Oil and Gas Methane Partnership 2.0, *Home Page*, <https://ogmpartnership.com/> (last visited Mar. 20, 2024).

19. IGSD, A PRIMER ON CUTTING METHANE: THE BEST STRATEGY FOR SLOWING WARMING IN THE DECADE TO 2030 (2024), <https://www.igsd.org/publications/a-primer-on-cutting-methane-the-best-strategy-for-slowng-warming-in-the-decade-to-2030/>.

0.3 degrees by 2040 and 0.5 degrees in the Arctic, which is specifically important when we're talking about tipping points.²⁰ We know that if we lose the Arctic, it is game over. The IPCC report on climate solutions also put methane in the spotlight and reinforced that deep and rapid cuts to methane emissions are essential to limit warming in the near term and limiting overshooting 1.5°C degrees.²¹

Exceeding the 1.5°C guardrail increases the risk that self-amplifying feedbacks further accelerate rising temperatures and trigger a cascade of irreversible tipping points in the climate system.²² What is required is for us, and the whole world, to go back to a safe climate zone. Limiting warming to 1.5°C with no or limited overshoot requires reducing global anthropogenic (human-caused) methane emissions by 34% in 2030 and 44% in 2040 relative to modelled 2019 levels, in addition to cutting global CO₂ emissions in half in 2030 and by 80% in 2040, and deep cuts to other short-lived climate pollutants and nitrous oxide.²³ Obviously, these numbers change, first according to how effective we are in implementing these regulations to reduce methane, but also depending on how the climate system is reacting.

According to the CCAC, currently available measures could reduce anthropogenic methane emissions from energy production back toward the waste and agriculture sectors—basically the main sources—by 45% by 2040. Roughly 60% of the available target measures have low mitigation cost, and just over 50% of those have negative cost where the measures pay for themselves.²⁴

So, we have the science, we have the technology, and it's affordable. It's the only way to reduce the rate of warming in the near term, which is essential not only for life, but for everything that we value, including property and the economy. If we have a runaway climate crisis, we know we will be in a chaotic society.

The world, little by little, has acknowledged this importance of methane mitigation, and has moved to voluntary commitments. Already, 187 countries mention methane in their nationally determined contributions, with different

degrees of ambiguity. Tomás mentioned the Global Methane Pledge, where the leadership of the United States during the Biden Administration played a key role to increase the awareness of methane mitigation of countries around the world and jointly commit to a collective effort to reduce global methane emissions at least 30% by 2030 levels.

Also under Biden's leadership, a dialogue with China began again on climate. As a result, the two countries released a joint statement at COP26 that acknowledged the importance of working together on methane.²⁵ Due to that renewed climate dialogue, one month before COP28, a joint statement was issued at Sunnylands,²⁶ where again methane was discussed and China finally attended and presented its national action plan on methane. I think it's very important that these countries are collaborating on this issue. It shows the importance of methane mitigation to avoid a runaway climate crisis.

It is also important to note the Oil and Gas Decarbonization Charter. There are hundreds of voluntary commitments by sectors, by institutions, by countries, and by financial institutions. So, we're in a good political momentum on voluntary commitments. The question is, will these voluntary commitments provide the necessary action at the scale that we need to slow the rate of warming on time? It is essential to look a bit closer at what voluntary commitment has done in other areas but also, most importantly, how we can move from voluntary commitments to a global mandatory framework.

What else has happened? We have discussed regulations and national plans. China, the United States, Canada, the EU, Vietnam, Finland, Sweden, Norway, the Netherlands, the United Kingdom, Brazil, Iceland, and the Republic of Korea all have national plans already in place. Many countries are working on them: Egypt, Colombia, and so on. In November 2023, the Council of Europe reached a provisional agreement with the European Parliament on the final version of methane regulations, including monitoring, reporting, and verification measures, that should be applied by exporters to the EU by January 1, 2027, and maximum methane intensity values by 2030.²⁷ The imple-

20. CCAC, GLOBAL METHANE ASSESSMENT: BENEFITS AND COSTS OF MITIGATING METHANE EMISSIONS (2021), https://www.ccacoalition.org/sites/default/files/resources/2021_Global-Methane_Assessment_full_0.pdf.

21. IPCC, CLIMATE CHANGE 2022: MITIGATION OF CLIMATE CHANGE. CONTRIBUTION OF WORKING GROUP III TO THE SIXTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (Priyadarshi R. Shukla et al., eds. 2022), https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf.

22. Timothy M. Lenton et al., *Climate Tipping Points—Too Risky to Bet Against*, 575 NATURE 592, 594 (2019).

23. IPCC, *Summary for Policymakers*, in CLIMATE CHANGE 2022, *supra* note 20.

24. UNITED NATIONS ENVIRONMENT PROGRAMME & CLIMATE AND CLEAN AIR COALITION, GLOBAL METHANE ASSESSMENT: BENEFITS AND COSTS OF MITIGATING METHANE EMISSIONS 10:

Roughly 60 per cent, around 75 Mt/yr, of available targeted measures have low mitigation costs, and just over 50 per cent of those have negative costs—the measures pay for themselves quickly by saving money (Figure SDM2). Low-cost abatement potentials range from 60-80 per cent of the total for oil and gas, from 55-98 per cent for coal, and approximately 30-60 per cent in the waste sector. The greatest potential for negative cost abatement is in the oil and gas subsector where captured methane adds to revenue instead of being released to the atmosphere.

25. Press Release, U.S. Department of State, U.S.-China Joint Glasgow Declaration on Enhancing Climate Action in the 2020s (Nov. 10, 2021), <https://www.state.gov/u-s-china-joint-glasgow-declaration-on-enhancing-climate-action-in-the-2020s/>.

26. Press Release, U.S. Department of State, Sunnylands Statement on Enhancing Cooperation to Address the Climate Crisis (Nov. 14, 2023), <https://www.state.gov/sunnylands-statement-on-enhancing-cooperation-to-address-the-climate-crisis/>.

27. Press Release, Council of the EU, Climate Action: Council and Parliament Reach Deal on New Rules to Cut Methane Emissions in the Energy Sector (Nov. 15, 2023), <https://www.consilium.europa.eu/en/press/press-releases/2023/11/15/climate-action-council-and-parliament-reach-deal-on-new-rules-to-cut-methane-emissions-in-the-energy-sector/>.

The Council and the Parliament agreed on three implementation phases. The first phase will focus on data collection and the creation of a methane emitters global monitoring tool and a super-emitter rapid reaction mechanism. In the second and third phases, equivalent monitoring, reporting and verification measures should be applied by exporters to the EU by 1 January 2027, and maximum methane intensity values by 2030. The competent authorities of each member state will have the power to impose administrative penalties if these provisions are not respected.

mentation of these regulations and the methane clauses in the IRA will have an impact on markets.

We also have help from the sky with satellites, including Copernicus, the International Methane Emissions Observatory, and others that are monitoring methane leaks from space. Further, on the ground is monitoring with FLIR cameras and flight monitoring. We are improving on every single aspect.

What are the elements of a global methane agreement? First, we need a Technological and Economic Assessment Panel (TEAP) that will tell countries based on experience what are the best technologies available, the more economic ones, and the ones that can be deployed at scale quickly and effectively. The CCAC put together the first-ever TEAP on methane and presented that at COP28.

Then, obviously finance is needed. At COP28, \$1 billion of funding was announced, including \$400 million from the philanthropic community. But we will need a specific finance mechanism if we're going to move to a global methane agreement.

We will need a scientific advisory panel. The CCAC put together the first-ever global methane assessment through their own scientific advisory panel. Maybe we can migrate part of that to a new mandatory methane agreement.

We need to think very carefully on the governance structure of that agreement. When I talk about a mandatory global methane agreement, I know many people will be skeptical. So, I want to share a story of success and why it is necessary to move toward a global methane agreement. This is a story that many people may know. The Montreal Protocol is the most successful environmental treaty ever agreed upon. It's also the most successful climate treaty because, while fixing the ozone, it has delivered immensely for climate protection. We would have already lost our fight against global warming if not for the Montreal Protocol.

So, these two great minds, Sherwood Rowland and Mario Molina, worked together and discovered that the ozone layer was being destroyed by specific chemicals that we were emitting. They were ridiculed by economic interests that, at that time, were making a lot of money from these chemicals. There were misinformation campaigns, they lost grants for research, and so on. It was not easy work, but the science was very strong. Yet, it was not enough at that time to push the international community and, on the contrary, they received a big backlash.

Clearly, there was a disinformation campaign from folks saying that the chlorofluorocarbons that we were putting in the atmosphere were not toxic, not corrosive, that they were harmless gases. There was a lot of disinformation to the public that this was not dangerous at all. But in 1985, the truth could not be hidden anymore. The whole world could see there was a big hole in our roof. There was a big hole over Antarctica, which was found by the British Antarctic Survey.

There was then a big reaction in the world. What happened? The same that is happening now. National regulations began to take place to phase out these chemicals. But soon the world realized that would not be enough to put the ozone layer on a path to recovery. We still needed

a global commitment to do so. We negotiated that agreement in an emergency mode because it was an emergency.

So, in 1985, it was the British survey that came into the public eye. And in 1987, the world put together the Montreal Protocol to protect the ozone layer and phase out ozone-depleting substances. Overall, it was a very difficult task, like it would be to put together a mandatory global methane agreement, but it's something that we have done before for chemicals, and we can do it again, but this time for methane.

At the beginning, there were only 86 governments that signed on to the Montreal Protocol, but the governance structure that was constructed was such a good one that it gained the necessary trust that governments could join and comply with a specific schedule to phase out these ozone-depleting substances and that there would be help under the process.

As a result, the Montreal Protocol was the first treaty in history to receive universal ratification—that is, all the countries of the world have signed and ratified the Montreal Protocol. The ozone layer is on the path to recovery. Again, voluntary commitments and national regulations to phase down ozone-depleting substances were important but not enough to put the ozone layer back into recovery. This is why we need a global methane agreement now; voluntary commitments and national regulations to mitigate methane are not enough to tackle the climate emergency that we are in.

Subsequently, Molina, Rowland, and Paul Crutzen received the Nobel Prize in Chemistry for this in 1995. But Molina specifically did not stop there. He worked with Durwood Zaelke and Stephen Andersen, and taught the world, through an amazing campaign, that we also needed to take care of HFCs, which are a super greenhouse gas. And the Montreal Protocol was amended, via the Kigali Amendment, to include HFCs. Now, we have a specific schedule, a mandatory schedule, on a super greenhouse climate gas to phase down HFCs under the protocol.

So, we did it not only once, but twice! We have global agreement on key issues and specifically with target measures, enforcement measures, and compliance measures in place. As I said, the Montreal Protocol is a treaty that really, really works on the ground. We can do that again, but this time on methane.

Barry Rabe: Thanks, Romina, for providing that invaluable take on how we might think about the international dimensions of methane policy, including possible ways of moving beyond the rather loose compilation of nonbinding pledges and voluntary actions that we've seen for carbon and now methane. The Montreal Protocol, and now the Kigali Amendment to it, remains the gold standard of enduring and effective climate policy, with many potential lessons for methane.

I want to share questions for each of our panelists, allowing for a little further dialogue. I've modified audience questions to try to account for at least a few of the topics that have emerged. First, Tomás, especially since you've set the groundwork for us on the U.S. landscape, one imme-

diate question that jumps out is the central role that state governments will be playing in many aspects of the state implementation plans (SIPs) and the like. Production states have long opposed expanded federal regulation applied to methane, reflected in waves of litigation and resistance to regulatory implementation.²⁸

Given that, I'm wondering how you see the role of federalism now, including EPA engagement for states in all areas of methane mitigation, including the SIP process. But more generally, does the Agency look at production states as partners when historically, whenever the federal government attempts to engage on methane, production states have seen it as the enemy and taken aggressive steps to thwart its efforts? Any thoughts that you'd like to share on that?

Tomás Carbonell: The authority that we are relying on for the existing source portion of our CAA rule is §111(d). It takes a classic cooperative federalism approach to regulation, in which states are responsible for developing plans to establish, implement, and enforce standards for existing sources with EPA approval and oversight.

As we were developing our CAA rule, we had a lot of engagement with states about how that process should work and what their needs might be. We paid a lot of attention in our proposal and in the final rule to key issues like deadlines, the kind of information that we are providing to guide the development of state plans, the kind of information that states would need to provide in their submissions to us, and what criteria might need to be put in place for approving state plans.

There were two different kinds of considerations that were important to balance. One, we recognized that we got a lot of feedback during the rulemaking process about how important it was to provide clarity and certainty for states—particularly states that maybe don't have well-developed regulations in place—as to what would constitute an approvable program.

In the rule, we tried to provide a lot of detail about the standards that we would consider to be presumptively approvable for states so that, if a state wanted to, it could essentially take the information that we've included in the rule off-the-shelf and use that as the basis of an approvable plan to regulate existing sources.

On the other hand, we also heard from states that they've already been regulating in the space for a while or already have approaches that work in their context. While there are certain constraints that we have to operate under when it comes to the CAA and the approvability of state plans, we did try to provide guidance on how we would evaluate existing state programs for consistency with our regulations and our guidelines, and also to provide information about flexibilities the states have to consider factors like remaining useful life when they're developing their plans, and how EPA will evaluate those.

Regardless of what circumstances states find themselves in, we are committed to working with them every step of the way. Our regional offices will be taking the lead in that process. We are planning to do a lot of engagement in the coming months as states start to begin that planning process.

Barry Rabe: Isabel, in the previous question, I was talking about what you do in a federal system where states take different positions and have a different capacity and the like to deal with these issues. On the corporate side, you have massive firms and you have smaller firms that are all in the business of producing oil and gas, especially in a context as vast and diverse as the United States. I'm wondering how you see that large-versus-small producer concept in thinking about all the challenges that have been discussed in terms of regulatory compliance.

There's also this question of actually being able to generate from all of those producers credible numbers—reliable and verifiable numbers on methane emissions after so many years where we have recognized that much of what emerges from industry, and then government estimates of what those emissions are, are off by large orders of magnitude. They tend to be in one direction, significantly underestimating releases. How do you see that larger kind of industry engagement in the future, particularly as we measure releases more accurately and firm performance likely differs markedly?

Isabel Mogstad: I also saw an audience question about what industry is doing and why industry maybe is or isn't leading in this space. I'm happy to sync these two questions. I think one of the things you're rightly pointing out is that it is important to recognize that industry is definitely not monolithic. It is extremely diverse not only in the size of the companies, but also the geographies in which we operate, which ultimately does have a significant impact on what our emissions or carbon-intensity profile might look like, the availability of infrastructure, and the availability of electrification.

What a company like BP confronts in our operations and decarbonization goals might look and feel a bit different to what other companies are experiencing. To this point about why industry is either leaning in or in some instances leaning out, many of our companies, and BP certainly, see reducing methane as a strategic advantage, a competitive advantage, the right thing to do for the environment, but also the right thing to do for our business.

I'll give an example. Over the past several years, we have been implementing a billion-dollar program in the Permian Basin in West Texas to electrify our facilities, to take out infrastructure that was powered by natural gas and replace that with equipment that's either powered by electricity or air instruments. That requires significant investment, retrofitting of existing facilities, and planning for new, innovative infrastructure going forward. It's a build-out of a \$100-million substation out in West Texas that creates enough electricity that it could power something like 300,000 residential homes in Austin. We need

28. FRANK J. THOMPSON ET AL., *TRUMP, THE ADMINISTRATIVE PRESIDENCY, AND FEDERALISM* (Brookings Inst. Press 2020).

that investment to help drive electrification and ultimately lower emissions in our operations in that area. We already have no routine flaring in our operations.

I used some of these as examples because industry is in different phases in our journeys to get to near-zero methane emissions. Back to the question about big versus small, we can talk about each individual company's goals and objectives in this space. But then when it comes to the reputation of natural gas both domestically for the short-to-medium term and its relationship to the energy transition, and then this global macro conversation we're having about the role of the United States in global LNG and international markets, a BP molecule is ultimately right now not distinguishable in a natural gas market from a smaller operator.

There's a collective reputational good situation at play that's important, which is that it's in the collective interest of the natural gas industry to be a leader on methane, to drive down emissions collectively, and to have a strong regulatory floor that establishes our industry as potentially a sort of best in class when it comes to the global consumption of natural gas and in some cases LNG.

I think the politics of the big versus small are real. I would point out, for example, that with the WEC, the key thing is that there is a per-metric-ton threshold for companies that qualify or are covered by the charge. It's emitting more than 25,000 metric tons per year. So, if you're a company that reports less than that, you're not exposed to the program. I think there's a natural tension, and perhaps dichotomy, with big versus small that is important to recognize, but we also all benefit collectively from having strong, well-designed regulatory programs.

Barry Rabe: Kyle, the question of LNG's future in the United States, including continued expansion, has been prominent in recent days given the project approval pause that has been outlined by the Biden Administration. Could you talk about what comes next as we think about bringing in and trying to implement many new regulations in the United States while continuing to play a major global role in exporting gas? What happens next?

Kyle Danish: This pause that's underway is going to allow DOE to evaluate the increasing LNG exports in the United States and what the climate and geopolitical implications of those are. At least on the climate side, it seems to me one very simplistic way to look at it is what's being considered is a kind of supply-side policy. What if we restricted the amount of LNG exports from the United States? Would that have some helpful climate impacts?

It seems to me that question involves a counterfactual determination of what the potential importers would do if they did not receive the LNG from the United States. If you assume that the demand for energy in other countries is probably growing, then the would-be importers will substitute the LNG they would have received from the United States with some other type of fuel. One possibility is that the substitute is renewable energy, which would be great for the climate. Another possibility is that they substitute

coal-fired energy, which would not be worse for the climate than the U.S. LNG.

Another possibility is that the substitute is LNG imported from some other country. The United States may be the biggest exporter of LNG in the world, but it still supplies a relatively small percentage of the total natural gas that is being used in the world. The other exporters are about 80% of the rest of it.

It seems to me there is at least the possibility that what happens if you restrict U.S. LNG exports is you just get gas from other places. I think this goes to what we were talking about earlier, which is that EPA and Congress are rolling out these policies that EPA has determined will reduce methane emissions associated with U.S. gas by 80% between 2024 and 2038.²⁹ That's going to significantly decrease the whole life-cycle analysis of greenhouse gas emissions associated with U.S. exports.

If you just take U.S. exports and restrict them, it seems to me it's just as possible that you're going to get substitutes of gas from countries that are not trying as hard on their methane emissions. So, it's possible that you'll have more methane-intense gas substitutes for the U.S. LNG exports that are taken off the market—either more methane-intense gas or coal, which I think is generally considered to be higher-emitting from a life-cycle analysis standpoint, but particularly once you've reduced methane emissions from U.S. gas by 80%.

Again, I'm not an analyst of global fuels markets. I don't know how much you'll get from renewables. I don't know what the substitution effects would be. But if you think it's at least possible that it would have that array of outcomes, then I think you have to take pretty seriously whether the U.S. export of very-low-methane-intensity natural gas could be a good thing for the climate in a lot of places.

Barry Rabe: Romina, you raised the interesting model of Montreal and Kigali. I've long thought that one key element in its durability and sustained effectiveness has been its ability to link global trade provisions with domestic regulatory provisions, mixing varying kinds of tools in unique ways. We just have not seen anything like this for CO₂, methane, nitrous oxides, or other greenhouse gases.

You also talked about carbon border adjustments being led by the EU facing an uncertain future. I'm wondering how you might see the role of the United States in this. Going forward, the United States will be the only member of the Group of Seven (G7) that has no price on carbon. However, it is about to become the first member of the G7 that, with the new methane charge, will impose a price on methane emissions. The only other place where this is done, to my knowledge, is Norway in some form.

Does the methane pricing issue create momentum or leverage for some form of coordinated global action? Or

29. U.S. EPA, Fact Sheet: Key Things to Know About EPA's Final Rule to Reduce Methane and Other Pollution From Oil and Natural Gas Operations (Dec. 2, 2023), <https://www.epa.gov/system/files/documents/2023-12/key-things-to-know-about-epas-final-rule-for-oil-and-natural-gas-operations-fact-sheet.pdf>.

are we going to need to see other kinds of linkages to begin to move in the direction that you're talking about on the multinational or global scene for methane?

Romina Picolotti: I think we can see from the past four years that the United States' role on how the world will move on methane is pivotal. You cannot isolate the discussion only to the United States or to the G7. We have enough countries today with political momentum to sit at the table and plan how this global governance framework can take place.

That also will respond to what some of the industry is asking for: certainty. As Isabel was saying, we need some certainty because these investments are long-term. This is a good moment to at least ask the question of how our

national efforts intertwine and whether we can, from these national efforts, move to a regulatory framework, because we do know that voluntary commitments are not enough. We have been trying to do this for a long time, and we have not succeeded.

Well, we don't have more time to fail. The only option that we have is to succeed because there is not another planet that we can move to. So, it is time to have tough discussions that will lead the world to an enforcement mechanism, a mandatory mechanism like Montreal. We can do this, but we will need the United States at the table. Obviously, yes, we will need China. By the way, China did mention that they support an institutional international framework on methane. So, I think they are also seeing the need to move in that direction in the near future.