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Reclassifying Methane And Ethane Could Overload EPA

By **Eric Groten** (April 29, 2021, 4:15 PM EDT)

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On April 6, more than 400 environmental nongovernmental organizations submitted a petition to the U.S. Environmental Protection Agency for a rulemaking to remove methane and ethane from the agency's "negligibly reactive" volatile organic compounds list.

If granted, the petition could have even greater consequence for Clean Air Act regulation than the endangerment finding the EPA issued for greenhouse gases in 2009, following the U.S. Supreme Court's 2007 ruling in Massachusetts v. EPA.

This is because the Clean Air Act was built to regulate volatile organic compounds, or VOCs, in ways it was not built to regulate greenhouse gases — and so, labeling methane and ethane as VOCs would effectively unleash the regulation of those two compounds under all available Clean Air Act programs. Existing regulatory programs are not equipped to bear that load.

How VOCs Fit Into Federal Regulations

In 1970, Congress used Title I of the Clean Air Act to obligate the EPA to adopt national ambient air quality standards, or NAAQS, for the so-called criteria air pollutants — those typically associated with localized urban air pollution. The CAA further compels each state to adopt and obtain EPA approval of implementation plans sufficient to bring each area within the state into attainment of those NAAQS.

In addition to controlling the existing source population in such a way as to demonstrate attainment of the standards, the state implementation plans also must include permitting programs to ensure: (1) that new and modified major sources in attainment areas do not cause significant air quality deterioration (so-called PSD permits), and (2) that new source construction in nonattainment areas is offset by further reductions emissions from the existing source population. The CAA also requires various levels of control technology review as a precondition of permit issuance.

It is the NAAQS for ozone — the EPA's chosen indicator for smog — that has proven most intractable.[1] Ozone is formed by the photochemical reaction of volatile organic compounds and nitrogen oxides in sunlight, so achieving the ozone NAAQS requires regulation of VOCs.

Given that it is the photochemical reactivity of an organic compound that justifies its regulation under Title I of the CAA, the EPA has long maintained a list of organic compounds that are not photochemically

reactive, so that they are excluded from regulation. The list includes such relative rarities as, for example, 2-amino-2-methyl-1-propanol, as well as all chlorofluorocarbons.[2]

But the rest of the list is swamped in terms of ubiquity and volume by just two — methane and ethane — which the EPA recognized as negligibly reactive as far back as 1977.

New Petition to Regulate Methane and Ethane as VOCs

The April 6 petition claims that the current exemption for methane and ethane no longer serves what the environmental NGOs describe as its intended functions: (1) focusing control efforts on regulation of the most ozone-inducing compounds, and (2) incentivizing industry to develop and use less reactive compounds to reduce ozone formation (e.g., switching to water-based paints).

While acknowledging that methane and ethane are indeed of negligible reactivity, the petition asserts that they nonetheless should now be regulated, because what they lack in potency, they make up for in volume. According to the NGOs, this volume of methane and ethane emissions "significantly contribute to ozone formation along Colorado's Front Range and other parts of the country."[3]

Further, the petition says, given the asserted nature of their origin in the atmosphere — from oil and gas extraction — the incentivization of substitutes is not a factor. It is not possible to drill for oil and gas that contain no organic compounds. Accordingly, say the NGOs, the exemption no longer serves its asserted purposes.

The Intended and Unintended Consequences of Regulating Methane and Ethane as VOCs

The petition presumably is motivated by its stated belief that methane and ethane should be counted as VOCs for purposes of advancing attainment of the ozone NAAQS. But whatever the merits may be of the claims that methane and ethane contribute to ozone formation, the cure the NGOs prescribe would not only fail, but have serious side effects.

Stated another way, it is not as though the exclusion of methane and ethane as VOCs has caused oil and gas production or any other emission source to remain unregulated or unregulatable.[4] But deeming nonvolatile organic compounds to be VOCs will confound every existing regulatory program, diverting public and private resources to "a glorious mess" of the type that then-Rep. John Dingell, D-Mich., rightly predicted in 2008, shortly before the EPA asserted its ability to use the Clean Air Act to regulate carbon dioxide, a constituent of clean air vital to life on Earth.

As the NGO petition itself acknowledges, there is no ability to substitute other, less volatile alternatives to oil- and gas-related emissions of methane and ethane. And because almost all methane and ethane streams are accompanied by listed VOCs, the regulation of those streams already is either required or at least allowed, or occurs as a inevitable consequence of regulating true VOCs.

Further, even assuming that adding methane and ethane to the definition of "VOC" would authorize new regulation, it is not at all clear what that regulation would be. They are not susceptible to additional control except by combustion, which many of these same NGOs oppose.

There would inevitably be other side effects of this futile prescription.

Distorting Air Quality Permitting Obligations

The Clean Air Act itself defines a major source as one with a potential to emit 100 or 250 tons per year, depending on the source category. If methane and ethane were included in that total — as they would have to be if these compounds were classified as VOCs — and depending on estimation techniques, every well pad could be deemed a major source, subject to appropriate preconstruction permitting.

Or consider that 100 tons per year is about 800 cows' worth of methane emissions — meaning that a typical Texas feed lot would exceed the major source threshold by a factor of about 50. The yearslong time frames and demonstrations required to get permitted as a major source or modification will overwhelm permitting bureaucracies almost as much as the decision to call CO2 a regulated air contaminant, which led to the so-called tailoring rule, and all of the litigation that rule fostered.

Efforts to adapt the CAA's prescribed permitting thresholds to include methane and ethane as pollutants may not receive a warm judicial reception. As former Supreme Court Justice Antonin Scalia warned in his opinion in Utility Air Regulatory Group v. EPA in 2014, which disposed of the last tailoring rule, the EPA "may not rewrite clear statutory terms to suit its own sense of how the statute should operate. We are not willing to stand on the dock and wave goodbye as EPA embarks on a multiyear voyage of discovery."

Reconsideration of all Existing VOC-Related Requirements Established Under Clean Air Act

A requirement to include methane and ethane as VOCs in any determination of VOC emissions would immediately put sources of methane and ethane out of compliance with the limits on VOC established in all rules and permits.

This would include not just the VOC limits established in state plans for achieving the ozone NAAQS, but in permits issued pursuant to the CAA, and in all of the new source performance standards adopted under Section 111 of the CAA, and any standards for hazardous air pollutants established under Section 112 that use VOC emissions as a surrogate for HAPS.[5]

The EPA might try to find some way of grandfathering or phasing in the new definition, but many of the same NGOs petitioning here have proven uncooperative partners in efforts to allow transition periods of compliance when obligations change — e.g., appealing permits when the standards applicable to issuing permits change weeks before the end of a years-long permits process. At the very least, the consideration of methane and ethane as VOCs will require a comprehensive review of the achievability of VOC limits, when adding in methane and ethane emissions.

These innumerable reconsiderations would occur in an atmosphere of uncertainty over whether, and how, to enforce the limits as originally intended, considering only truly volatile organic compounds is assessing VOC emissions. Amid such uncertainty, it is very likely that targeted citizen suits in favored federal district courts will advance enforcement claims.

The NGOs do not address these consequences in their petition, but no doubt they are aware of them. The petition also confirms that it is motivated as much by the desire to regulate methane and ethane as greenhouse gases as by the desire to affect tropospheric ozone concentrations.

Accordingly, the petitioners may view these side effects as a feature, not a bug, because they will lead to another "glorious mess" sufficient to motivate Congress to directly address GHGs in the CAA. And in the meantime, the regulated community will be open to citizen suits for having failed to obtain proper permits their methane and ethane emissions, and for methane and ethane emissions that cause their

sources to exceed limits on VOC emissions.

Possible Dispositions of the Petition

The EPA's stance on the low reactivity of these compounds has not changed since 1977, even as it adopted various models for measuring reactivity over the years. Accordingly, the agency is well positioned to deny the petition — and that seems the more likely disposition.

But EPA leadership may instead view the side effects to be beneficial to motivating a Congressional response. And it is aware that technical judgments, such as the definition of a pollutant, are given deference by reviewing courts. (The decision to call methane or ethane VOCs does not involve any strictly legal question.)

Accordingly, agency leadership may conclude that the redefinition of VOCs is the cleanest path to removing pending impediments and disputes concerning the scope of regulation of these two GHGs under the CAA. Further, even if the EPA denies the petition, we need look no further than 2007's Massachusetts v. EPA case for an example of how NGOs can get even the discretionary decision to deny a petition before the reviewing courts for surprising outcomes.

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[1] Although the EPA has identified five other criteria pollutants and established NAAQS for them (nitrogen oxides, lead, sulfur dioxide, carbon monoxide and particulate matter), relatively few remaining nonattainment areas remain for these pollutants. To the extent that areas remain in nonattainment, it is almost invariably because the agency has moved the goal posts by reducing the applicable NAAQS one or more times over the past 50 years.

[2] Chlorofluorocarbons are nonreactive in the lower atmosphere, allowing them to reach the stratosphere, and there to react with and break down stratospheric ozone, with deleterious effects on protection from ultraviolet radiation. As such, CFCs are instead regulated under Title VI of the Clean Air Act, and limited under international agreements.

[3] The petition cites only a law review article in support of this proposition.

[4] As but one clear example, the new source performance standards adopted for oil and gas operations consist of two separate subparts, Subpart OOOO to regulate VOCs, and Subpart OOOOa, added in 2015 to nominally regulate GHGs (methane and ethane). They do not in any meaningful way differ in what they require of the regulated source population; rather, the EPA adopted Subpart OOOOa for the primary purpose of declaring GHGs to be regulated, thereby triggering the obligation of states to adopt existing source performance standards for the upstream oil and gas industry.

[5] The limits for mobile sources under Title II of the Act might escape as drastic a revolution because they regulate "nonmethane organic compounds" instead of "VOCs," and the petition does not (yet) seek to disturb that definition.