DIALOGUE

FOUNDATIONS OF THE ENDANGERMENT FINDING

SUMMARY

In 2009, the U.S. Environmental Protection Agency (EPA) published what is commonly referred to as the "endangerment finding." Prompted by the U.S. Supreme Court's landmark decision in *Massachusetts v. Environmental Protection Agency* (2007) and reflecting robust science, the finding determined that six key greenhouse gases qualify as air pollution under the Clean Air Act and pose a threat to the health and welfare of future generations. This authorized EPA to set emissions standards for motor vehicles and other major sources of greenhouse gases; however, the Agency recently announced the finding will undergo reconsideration of whether it "complies with the law and is based on sound science and policy." On May 22, 2025, the Environmental Law Institute hosted a panel of experts to discuss the legal and scientific foundations of the endangerment finding. Below, we present a transcript of that discussion, which has been edited for style, clarity, and space considerations.

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Phil Duffy is Chief Scientist at Spark Climate Solutions.
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Sarah Vican: Our moderator, Jonathan Cannon, is the Blaine T. Phillips Distinguished Professor of Environmental Law emeritus at the University of Virginia (UVA) School of Law. He joined the UVA law faculty in 1998 after a distinguished career at the U.S. Environmental Protection Agency (EPA) in addition to private practice. He is founding director of the law school's Program in Law, Communities, and the Environment.

Jonathan Cannon: Thanks so much. With me are our expert panelists, who will help us navigate the strengths and possible vulnerabilities of EPA's 2009 endangerment finding for greenhouse gas (GHG) emissions.[1] That finding is the linchpin of EPA's authority to regulate these emissions from domestic sources.

In March of this year, EPA Administrator Lee Zeldin put a bullseye on that finding, vowing to "driv[e] a dagger straight into the heart of the climate change religion."[2] It's a full inversion of science and religion, as my friend Bob Sussman has pointed out. The question today for our panel is, is this a vow that Zeldin has any reasonable hope of keeping?

Dr. Phil Duffy is a climate scientist who now serves as the chief scientist at Spark Climate Solutions. He was previously a senior adviser in the White House Office of Science and Technology Policy in the Joseph Biden and Barack Obama Administrations, and has held other senior positions in government as well as in climate-oriented nongovernmental organizations. He has written on the risks of climate change, and is the lead author of a 2019 article in the journal *Science* summarizing how science offers even stronger support for the endangerment finding that EPA had issued 10 years earlier.[3]

Lisa Heinzerling is the Justice William J. Brennan Jr. Professor of Law at Georgetown Law Center, a leading environmental law scholar, and also a gifted advocate. She was a principal drafter of the briefs in *Massachusetts v. Environmental Protection Agency*[4] that made the successful case for regulation of GHGs under the Clean Air Act (CAA), paving the way for the endangerment finding of 2009 and the EPA climate rules that followed. With Phil, Lisa is a coauthor of the *Science* article on the endangerment finding, and she has written extensively on regulations in administrative practice and statutory interpretation by the U.S. Supreme Court.

1. Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66496 (Dec. 15, 2009).
2. Press Release, U.S. EPA, EPA Launches Biggest Deregulatory Action in U.S. History (Mar. 12, 2025), https://www.epa.gov/newsreleases/epa-launches-biggest-deregulatory-action-us-history.
3. Philip B. Duffy et al., *Strengthened Scientific Support for the Endangerment Finding for Atmospheric Greenhouse Gases*, 363 Science eaat5982 (2019), https://www.science.org/doi/pdf/10.1126/science.aat5982.
4. 549 U.S. 497 (2007).

There seem to be at least three broad avenues for trying to get rid of climate regulation under the CAA, which is the current EPA Administrator's ultimate goal. First, the Agency could get rid of the ruling that GHG emissions are air pollutants under the Act. If they aren't, there's no occasion for an endangerment finding or anything else in that regard.

Second, EPA could reinterpret the endangerment standard that it used in its 2009 finding to include different considerations, which would be more amenable to a possible finding that endangerment does not exist.

Third, it could debunk the science. I'll leave that in short form because Phil is going to elaborate on that later. I'm going to give a historical, legal background relevant to these possible avenues of attack to put us all on the same page, and then I'm going to turn to Phil and Lisa for their expert analyses.

We begin with the Supreme Court's decision in *Massachusetts*. That decision was occasioned by an environmental group's petition asking EPA to regulate GHG emissions from motor vehicles under §202 of the CAA. Section 202 says the Administrator shall mandatorily set standards for the emission of any air pollutant, broadly inclusive, from new motor vehicles, "which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare."[5] That's the standard for the endangerment finding.

The George W. Bush EPA denied the petition, saying that GHGs were not air pollutants under the Act, and therefore that it lacked the authority to regulate them. In any event, even if the GHGs were air pollutants, it would not be wise, EPA said, not effective or appropriate, to reach a decision on endangerment at that time. EPA cited a number of policy arguments for this and also uncertainty about the causes and future extent of climate change.

By a 5-4 majority, the Supreme Court held that GHGs are air pollutants subject to regulation under the CAA, reciting the Act's capacious definition of the term "air pollutant." The Court further held that EPA was required to address the scientific merits of endangerment, yay or nay. It could not avoid making a decision for policy reasons not germane to the statutory criteria for the finding. Uncertainty was not a reason for not making a finding unless it was so great that it brought into question whether a finding could actually be made.

The majority's ruling on the definition of "air pollutant" as applied to GHGs was a facial reading, a plain-meaning reading of the statutory text. The dissenters, led by Justice Antonin Scalia—and this is ironic to me—relied on *Chevron*[6] to support the government's contrary interpretation.

Two years after *Massachusetts*, in 2009, the Obama EPA issued the first endangerment finding applying the standard set forth in §202. The Agency interpreted the endangerment finding as having two components, endangerment and the question of "cause or contribute" related to particular classes or sources of emissions.

Consistent with this interpretation, the Agency found in its endangerment finding that six GHGs taken in combination endangered the public health and welfare of current and future generations. That's the general endangerment finding. Also, that the combined emissions of these GHGs from new motor vehicles contributed to the GHG air pollution that endangers public health and welfare. That's the more specific source of the cause or contribute analysis.

EPA interpreted the endangerment language of §202 as broadly precautionary and preventive, citing an earlier U.S. Court of Appeals for the District of Columbia (D.C.) Circuit decision, *Ethyl Corp. v. Environmental Protection Agency*,[7] interpreting similar language under another provision of the CAA when looking at regulation of gasoline additives. It is important in this setting because it interprets a similar provision. It read "endanger" in a different statutory setting to reach a similar result.

EPA declined to consider things like adaptation and mitigation, the effectiveness of possible regulation, or the benefits of activities that require GHG emissions to make its determination of whether endangerment exists. On review of this endangerment finding in *Coalition for Responsible Regulation*, the D.C. Circuit upheld the finding, noting that it was not arbitrary and capricious.[8] Among other things, the court affirmed EPA's precautionary reading of §202 and its refusal to take into account collateral considerations like the effectiveness of possible regulations or the effects of adaptation. It concluded that there was substantial evidence to support the Agency's marshaling of the science.

The D.C. Circuit's ruling on the endangerment finding was not reviewed by the Supreme Court (although other issues in *Coalition for Responsible Regulation* were). Subsequent Supreme Court decisions bolstered *Massachusetts*' core ruling of EPA's authority over GHGs even while, in some cases at least, scaling back the reach of that authority.

In *American Electric Power Co. v. Connecticut* (*AEP*),[9] the Court determined that the CAA, as interpreted by *Massachusetts* to cover GHG emissions, displaced federal common-law actions on climate change. The vote was 8-0, although two of the dissenters in *Massachusetts*, Justices Clarence Thomas and Samuel Alito, noted their continued disagreement with *Massachusetts*.

In *Utility Air Regulatory Group v. Environmental Protection Agency*,[10] the Court acknowledged EPA's presumptive authority to regulate GHG emissions under the CAA, while qualifying *Massachusetts* to hold that "air pollutant" could not be read to include GHGs in every statutory setting.

5. 42 U.S.C. §7521(a)(1).
6. Chevron U.S.A., Inc. v. Natural Res. Def. Council, 467 U.S. 837 (1984).
7. 541 F.2d 1 (D.C. Cir. 1976).
8. Coalition for Responsible Regul., Inc. v. Environmental Prot. Agency, 684 F.3d 102 (D.C. Cir. 2012), *aff'd in part, rev'd in part by* Utility Air Regul. Grp. v. Environmental Prot. Agency, 573 U.S. 302 (2014).
9. 564 U.S. 410 (2011).
10. 573 U.S. 302 (2014).

Other recent Supreme Court decisions not implicating the holding in *Massachusetts* have established new interpretive doctrines that will likely affect EPA efforts to reinterpret §202 and related provisions. Chief among those is *Loper Bright Enterprises v. Raimondo*,[11] which certainly will play into the analysis of the issues that Lisa will be exploring.

Against this dense background of legal and scientific support for the endangerment finding, how might EPA go about rescinding it, and what's the likely outcome if it does? I'm going to start with Phil speaking from the science side, although there is an inevitable overlap here between the science and the law.

Phil Duffy: I'm going to talk about the science supporting the endangerment finding. As Jonathan mentioned, the relevant language in the CAA is the phrase "may reasonably be anticipated to endanger the public health or welfare." I'm going to argue that the scientific evidence is more than sufficient to clear that bar. That was true in 2009, and it's even more true now. In making the case for this, as EPA did in 2009, I will rely heavily on existing syntheses of climate science, principally the Intergovernmental Panel on Climate Change (IPCC) and the National Climate Assessment.

Before I do, I want to note that, while most of the evidence for endangerment and most of the discussions of the endangerment finding are based on climate change, there are mechanisms independent of climate change by which GHGs are harmful. Therefore, these independent mechanisms provide additional evidence to support a finding of endangerment.

I'm thinking of two things here. The first is that carbon dioxide (CO_2) emissions cause ocean acidification. That's not a consequence of climate change. It's simply a consequence of elevated CO_2 in the atmosphere. Ocean acidification harms ocean ecosystems generally, and harms shellfish, which is an important industry in the United States and elsewhere. I want to note that in 2020, during the first Donald Trump Administration, EPA issued a report summarizing the economic costs of ocean acidification.[12] It found that those costs are quite substantial and will be quite substantial in the future.

The second mechanism by which GHG emissions are directly harmful independent of their role in climate change is that emissions of methane contribute to poor air quality. Methane is an ozone precursor. Tropospheric ozone causes respiratory ailments, heart disease, cancer, and strokes. A recent study estimated that by 2050, as many as 690,000 premature deaths per year may be attributable directly to methane emissions under a high emissions scenario.[13] A separate study by the International Energy Agency found that methane abatement in the fossil fuel sector could avoid nearly one million premature deaths by 2050.[14]

Turning to the endangerment finding, the finding in 2009 was based upon impacts to human health and societal impacts of climate change in six sectors: food production and agriculture; forestry; water resources; sea-level rise and coastal areas; energy, infrastructure, and settlements; and ecosystems and wildlife. I want to point out that the choice of those sectors is not specified in the CAA, and that they aren't the only possible sectors upon which an endangerment finding could be based.

As I mentioned, to establish endangerment in 2009, EPA leaned heavily on existing syntheses of climate science, particularly the IPCC and the National Climate Assessment. It was appropriate for them to do that because those are very authoritative sources. The authoritative nature of those sources comes from the processes by which they're produced. Both the IPCC and the National Climate Assessment are contributed to by hundreds of authors. They're subjected to multiple rounds of peer review, and they are approved by governments. The processes for producing the IPCC reports and the National Climate Assessment are thorough. They're very inclusive, and they're also very transparent.

As an example, the most recent IPCC report, the Sixth Assessment Report,[15] was contributed to by 720 authors representing 90 countries. There were two rounds of review, and in the summary statements, every single sentence was approved unanimously by all national governments. Again, it's a very authoritative report.

So, what's changed since 2009? The evidence for and harms from climate change have become both stronger and more diverse, more broadly based. In 2018, during the first Trump Administration when there were rumblings about possibly challenging the endangerment finding or overturning it, I and a number of colleagues, including Lisa, wrote a paper summarizing how the scientific evidence for endangerment had become stronger since the endangerment finding was issued in 2009.[16]

In the paper, we made a couple of high-level points. One was that in the societal sectors considered by the endangerment finding, which I just outlined, evidence tying societal impacts to climate change had become stronger. Also in those sectors, the severity of the impacts had become stronger since 2009.

We also noted that new areas had emerged with evidence supporting a finding of endangerment. Those new areas include national security, violence generally, and quantified economic harms. We also noted the emerging science of event attribution, which in a probabilistic way associates specific extreme weather events with human-

11. 603 U.S. 369 (2024).
12. Christopher Moore & Jasmine Fuller, *Economic Impacts of Ocean Acidification: A Meta-Analysis* (Nat'l Ctr. for Env't Econ., Working Paper No. 20-02, 2020), https://www.epa.gov/sites/default/files/2020-10/documents/2020-02.pdf.
13. Zosia Staniaszek et al., *The Role of Future Anthropogenic Methane Emissions in Air Quality and Climate*, 5 npj Climate & Atmospheric Sci. art. 21 (2022), https://doi.org/10.1038/s41612-022-00247-5.
14. International Energy Agency, The Imperative of Cutting Methane From Fossil Fuels (2023), https://www.iea.org/reports/the-imperative-of-cutting-methane-from-fossil-fuels.
15. IPCC, *Sixth Assessment Report*, https://www.ipcc.ch/assessment-report/ar6/ (last visited July 1, 2025).
16. Duffy et al., *supra* note 3.

caused climate change. We noted, too, that to establish endangerment, realization of harm is not needed. It's sufficient to reasonably anticipate that there will be harms.

What I want to do now is to read you some summary statements from recent IPCC reports and recent National Climate Assessments. Again, I note that these are authoritative sources because of the number and diversity of authors, the extent of peer review, and the approval that occurs. In the case of the IPCC, there is unanimous approval of summary statements by national governments.

The IPCC's sixth assessment report, the first piece of which was released in 2021, includes the following: "Observed warming is driven by emissions from human activities with [greenhouse gas] warming partially masked by aerosol cooling,"[17] and "[h]uman-induced climate change, including more frequent and intense extreme events, has caused widespread adverse impacts and related losses and damages to nature and people beyond natural climate variability."[18] These statements are saying two things: (1) that GHG emissions cause climate change, and (2) that climate change impacts society in ways that are harmful.

I want to turn now to the National Climate Assessment. This is similar to the IPCC; the main difference is that it focuses exclusively on the United States. Some people think about the National Climate Assessment as the IPCC for the United States. The most recent National Climate Assessment was released in November 2023.[19] As with the IPCC, this is contributed to by hundreds of authors. It had multiple rounds of review, public comment, and government approval. The summary statement from the Fifth National Climate Assessment is as follows:

> Emissions of greenhouse gases from human activities, fossil fuel use in particular, have unequivocally caused all global warming observed over the industrial era. . . . Climate changes are making it harder to maintain safe homes and healthy families; reliable public services; a sustainable economy; thriving ecosystems, cultures, and traditions; and strong communities.[20]

Again, this is saying two things: (1) that GHG emissions cause climate change, and (2) that climate change is causing societal harms.

I want to also go back to the Fourth National Climate Assessment, the previous edition of the climate assessment, that was released in 2018. The reason I want to go there is that that version of the National Climate Assessment was released during the first Trump Administration. So, the following language was released by the Trump White House in 2018:

> The warming trend observed over the past century can only be explained by the effects that human activities, especially emissions of greenhouse gases, have had on the climate. Climate change is transforming where and how we live and presents growing challenges to human health and quality of life, the economy, and natural systems that support us.[21]

This is saying GHGs cause climate change, and that climate change is endangering the health and welfare of the people. That's exactly consistent with the language in the CAA to support endangerment.

Finally, I'll mention that, since the endangerment finding, numerous other independent scientific bodies have further affirmed the dangers posed by GHG emissions and the dangers posed by climate change. These bodies include the National Academy of Sciences here in the United States, corresponding scientific academies in other nations, professional societies like the American Geophysical Union, and so on. There's really no significant disagreement among scientists at this point about the reality of climate change, that GHGs cause climate change, and that climate change is harmful. The evidence for endangerment was overwhelming in 2009, and it's even stronger now.

Overturning the endangerment finding using scientific arguments would be extremely difficult. If you want to try to argue that GHG emissions are harmless, you will have to first propose a plausible alternative explanation for the warming and so forth that we've observed over the past 100 years. You would further have to prove somehow that the more than 100 years of scientific understanding of the greenhouse effect is somehow wrong. You would further have to show that there are no harms from either real or anticipated ocean acidification and no air quality impacts from methane emissions. That would be extremely challenging.

Jonathan Cannon: We'll hear from Lisa now, and then we'll get into some back-and-forth.

Lisa Heinzerling: What Phil has just said makes us realize that it may be not a good idea for EPA to try to overturn the scientific basis of the endangerment finding or to disagree with it in the way that would be required to make it actually hold up in courts. What I'm going to talk about are the possible legal arguments that EPA might make in reconsidering the finding.

17. IPCC, 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 43 (Core Writing Team et al. eds., 2023), https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_FullVolume.pdf.
18. IPCC, Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change 9 (H.-O. Pörtner et al. eds., 2022), https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FullReport.pdf.
19. U.S. Global Change Research Program, Fifth National Climate Assessment (A.R. Crimmins et al. eds., 2023), https://nca2023.globalchange.gov/downloads/NCA5_2023_FullReport.pdf.
20. *Id.* at 3-35, 1-23.
21. U.S. Global Change Research Program, Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II, at 36 (D.R. Reidmiller et al. eds., 2018), https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf.

Obviously, we don't know yet what arguments it will make. But in announcing EPA's reconsideration of the endangerment finding, Administrator Zeldin seemed to hint that EPA has legal grounds for revisiting the finding. His announcement seemed to gesture toward what I see as three possible legal arguments.

The first possible legal argument is that, in deciding whether GHGs endanger public health or welfare, EPA should have considered the costs of the regulatory obligations that might be triggered by the finding. The problem with this argument is that it's inconsistent with the statutory language, judicial precedent, and long-standing regulatory practice.

The relevant statutory language comes, as we know from Jon's comments, from CAA §202(a)(1). The question that's posed to EPA on endangerment is whether air pollution may reasonably be anticipated to endanger public health or welfare. The sole focus of that part of the finding is the endangerment of health or welfare. There's not a single word about regulatory costs in this provision of the CAA.

The very next section, §202(a)(2), describes the standards or how the standards are to be set for motor vehicles once an endangerment finding has been made. That section does instruct EPA to consider costs. In fact, there are 14 references to costs overall in §202, but none in the section that is critical to the endangerment finding—§202(a)(1).

Indeed, the whole CAA reveals a similar pattern—it requires EPA to study the risks of pollutants and decide whether they're dangerous, and then requires the Agency to set standards to reduce emissions and to think about costs in setting those standards. So, not only is there the absence of costs in §202(a)(1), but the presence of it everywhere else suggests that costs are not part of the endangerment equation in §202(a)(1). Indeed, similar reasoning under the CAA persuaded the Supreme Court to unanimously declare that costs weren't part of the calculation in setting national air quality standards in *Whitman v. American Trucking Ass'ns*.[22] Thus, cost isn't in §202(a)(1). The only thing that's there is endangerment.

Second, not just the statutory language but judicial precedent, I think, forecloses the approach that EPA might take in reconsidering endangerment. That is the *Massachusetts* decision that Jon described. There, the Supreme Court called the decision about endangerment a scientific judgment. The Court held that EPA had erred, as Jon said, in citing extra-statutory policy considerations such as the assertion that regulation under the CAA would be inefficient in declining to regulate GHGs under §202. The Court said it wasn't deciding whether and to what extent EPA could consider what it called "other policy concerns" if EPA found endangerment, but it was clear according to the Court that these weren't to be part of the endangerment finding itself or the endangerment calculus.

In my view, the best reading of *Massachusetts* is that this part of the decision was a statutory holding. Therefore, it would be protected by something called statutory stare decisis, which is protection of precedent interpreting statutes. That's especially strong. The reasoning there is that, if the U.S. Congress disagreed with the interpretation, it could overturn the interpretation. Unlike, for example, constitutional interpretation. So, I think that's protected by statutory stare decisis. It's certainly a statutory case, and that's the way the opinion reads.

Looking at other judicial precedent, the D.C. Circuit, as Jon mentioned, upheld the endangerment finding and rejected the idea that EPA should have considered what it called "policy concerns and regulatory consequences" in making the finding. The D.C. Circuit explicitly rejected this argument as a statutory matter. Not as a matter of an agency's exercise of its discretion or a matter that might go either way, but as a statutory matter. The court said that arguments about costs and other policy concerns are foreclosed by the language of the statute in terms of the endangerment finding.

Administrator Zeldin often talks about EPA's approach in the endangerment finding being "authorized but not required." If he means that with respect to this aspect of the argument that EPA made, I think he's wrong. I think it's required. The approach that EPA took in not considering these other policy concerns was required.

Another piece of this argument with respect to costs is long-standing regulatory practice. As far as I can tell, EPA has not considered costs in other endangerment findings dating back 50 years. Indeed, the first endangerment finding under the CAA was related to the public health dangers of leaded gasoline, in *Ethyl Corp.*, which Jon mentioned. The finding was all about scientific evidence, not about regulatory costs.

The same has been true of other endangerment findings. So, in order to change this approach under the CAA, even if the statute allowed it—which I believe it does not—the Agency would have to explain why it's making this change. It would need to discuss any reliance interests that have arisen in the 50 years that EPA has taken this approach to the endangerment findings under the statute.

A second possible legal argument is that EPA should have been more precise about how GHG emissions from new U.S. motor vehicles lead to climate change and endanger public health. It's not exactly clear what the argument here is or might be, but the idea seems to be to target a small portion of the overall GHG pollution in determining whether there is endangerment of human health and welfare.

The same three problems come up here: statutory language, judicial precedent, and regulatory history. Under §202(a)(1), the whole point is to consider whether there is endangerment. A piece of it, as Jon mentioned, refers to air pollutants from new motor vehicles. The language is about the pollution actually causing or contributing to air pollution that endangers. I think EPA's argument, going forward, might be that you look at the industrial sector that causes the emissions, and make that as small as possible, and then figure out whether that sector endangers public health or welfare.

22. 531 U.S. 457 (2001).

In fact, EPA has pointed out that the section looks at the air pollution to which pollutants from a particular sector contribute, and that air pollution is what must endanger health and welfare. That is, indeed, the approach EPA took in the endangerment finding. That seems entirely consistent with the way the statute reads, which is about the air pollution endangering public health and welfare.

Indeed, this part, too, is protected by statutory precedent. The other parts of the statutory language refer only to cause or contribute. They don't specify any particular quantum of causation or standard for causation. The provision doesn't have "significant" modifiers that actually appear in other parts of the CAA. So it seems that here, too, the Agency correctly found, in making the endangerment finding, that the statute covered what it was doing.

There's also a precedent on this aspect of the potential legal arguments against the endangerment finding. In the *Ethyl* case, EPA faced the question about how to figure out whether lead in gasoline endangers public health and welfare. The Agency looked at it as the whole of the lead problem endangering public health and welfare. It didn't think that it was necessary under the statute to describe the exact percentage or amount contributed by lead in gasoline.

The D.C. Circuit blessed that. Here again, it's important to think about the basis for it. It wasn't because EPA exercised its discretion in one way and it could have exercised it in another, but the court specifically said it was blessing that as this interpretation of the statute. It wasn't giving any deference to the Agency's interpretation. This was before *Chevron* had been decided, but it was nevertheless already a time when courts talked about deference to agencies' interpretations.

In any event, judicial precedent there, too, supports what EPA did in 2009. Indeed, maybe even compels that kind of generous understanding about how EPA should go about the endangerment finding. Here, too, the Agency would have to explain why it's not engaging in this approach anymore. It would have to explain, for example, what damage would be done to the purposes and underlying premises of the CAA if the Agency started to slice up different sectors and decide that it could only find harm based on those sectors standing alone. If it didn't find a global harm from one particular sector or one particular class of engines in one particular sector, it couldn't regulate them. It would have to explain how, in other words, that understanding doesn't disrupt the plan of the CAA.

The last argument that I expect EPA to consider is that intervening Supreme Court decisions since the endangerment finding was made have changed things so much that they render the endangerment finding legally vulnerable. There are three cases that Administrator Zeldin cites in his announcement of the reconsideration: *Michigan v. Environmental Protection Agency*,[23] *West Virginia v. Environmental Protection Agency*,[24] and *Loper Bright*.

I don't think these cases help EPA in this regard. In *Michigan*, the Supreme Court held that EPA had erred in not considering the costs of regulating toxic air pollutants when it was deciding whether to regulate them. That was under a provision of the CAA totally different from §202, which we've been talking about. The Court said that EPA needed to decide whether it was appropriate to regulate power plants under that section. EPA had not considered costs, and the Supreme Court said the Agency needed to consider costs.

That's a very different section from §202 and different from the endangerment finding. There's no word like "appropriate"—no open-ended term that gives EPA the authority to decide it's just not right, they don't like it, it's not their policy, and so forth under §202. I don't think *Michigan* helps the Agency.

West Virginia is a case in which the Supreme Court held that an agency can't resolve "major questions"—questions of great political and economic importance—without clear directions from Congress. That's not what happened in *Massachusetts*. It wasn't EPA that said, oh, please let us regulate GHGs. It was the Supreme Court that effectively ordered EPA to decide whether GHGs endanger public health or welfare. *West Virginia* is not germane, it seems to me. Indeed, the Supreme Court held in *Massachusetts* that the CAA is clear on the coverage of GHGs.

Loper Bright is the case that overruled *Chevron*, which held that courts should defer to the reasonable interpretations of the agencies that are charged with implementing a particular statute. The Court said that the courts have to tell us what the single best interpretation of a statute is without deferring to the agency's position on that statute.

The thing is, that's what the Court did in *Massachusetts*; the Court decided on its own, independently, what the CAA meant. Nothing in *Loper Bright* takes away the precedential authority of previously decided statutory cases. Indeed, in overruling *Chevron*, the Court made clear that it wasn't overruling the cases that had relied on *Chevron*. The only justices who relied on *Chevron* in *Massachusetts* were the conservative justices in dissent, as Jon pointed out.

It seems to me the work under *Loper Bright* has been done already. It was the Court's decision in *Massachusetts* that made an independent judgment about the meaning of the statute. I'll say, too, *Loper Bright* and the demise of the *Chevron* doctrine was, at least in large part, motivated by dissatisfaction with agencies' constant ping-ponging in statutory interpretation, taking one position and then taking another, and the destruction of reliance interests that that created. I think that if EPA relies on legal arguments in changing its mind about how the CAA approaches endangerment, *Loper Bright* actually undermines that project rather than supports it.

Jonathan Cannon: Thank you, Lisa. I concur in your comment about *Loper Bright*, as with your other comments. It's ironic that EPA would be citing *Loper Bright* as a sword to advance a different interpretation of §202 as if somehow that would give it cover. But it doesn't. It exposes the Agency to a court's inquiry: Why did you change an

23. 576 U.S. 743 (2015).
24. 597 U.S. 697 (2022).

interpretation that was adhered to before and approved by the D.C. Circuit? We should be a little concerned about that and, in any event, we're not going to give you any deference for your new determination.

Lisa disposed of a lot of the questions that I was going to ask about on the legal side of things. I did want to bring up one issue related to the *AEP* case. Does EPA or does Administrator Zeldin run some risk here by rescinding the endangerment finding? That in doing so, power companies, other companies that produce GHG emissions, will be exposed to federal common-law suits because the displacement rationale of *AEP* will no longer apply? Lisa, what are your thoughts?

Lisa Heinzerling: I think that the *AEP* case is pretty clear on this. The decision to delegate certain regulatory power to EPA is the thing that displaces federal common law. The Court even goes out of its way to include a whole separate section saying no matter what EPA does with that authority, whether it regulates or not, if it decides even not to regulate, that there would still be displacement. So it seems, to me at least, that undoing the endangerment finding would fit within the kinds of circumstances the Court talked about as not displacing federal common law.

Jonathan Cannon: I wonder whether that outcome would be different if the Administration took aim at *Massachusetts* itself and was successful in that.

Lisa Heinzerling: It should be different. *AEP* was premised on *Massachusetts*. The case relies on that decision. It was talking about EPA's statutory authority, even about forthcoming rules using that authority, although, again, it discounts the centrality of that. I think it should be different. Whether it would be is a different question.

Jonathan Cannon: I've got a long question for Phil. The endangerment inquiry is, as I understand it, a risk assessment. That is, trying to assess the risks of emissions of certain substances into the atmosphere both in the short term and in the longer term, including some speculative risks.

In its 2009 finding, EPA described its risk assessment process as requiring "[t]he Administrator to consider both current and future risks . . . to exercise judgment."[25] Here's the wording we haven't talked about much: "exercise judgment by weighing risks, assessing potential harms, and making reasonable projections of future trends and possibilities. . . . [W]hen exercising her judgment the Administrator balances the likelihood and severity of effects."[26]

All that is consistent with your account of the process and how it played out. My question is, are there plausible alternative risk assessment approaches or paradigms that could potentially lead to different outcomes here? I don't know enough about risk assessment to know, but I do know that risk assessment is hardly an area without some controversy and different approaches. I'm wondering whether there is some alternative lurking out there that could be employed to the advantage of the current Administration.

Phil Duffy: I think what's really evolved since the endangerment finding is the realization of climate impacts. Since 2009, it's become clear that we're experiencing impacts right now. Considerations of future risk, potential harms, and so forth really become less important when the impacts are happening right now.

Since 2009, the science has really advanced in terms of attributing both climate change itself and extreme weather to GHGs, and also attributing societal impacts. Things like impacts on crop yields and increases in wildfire risk. I think what's changed is that the impacts are here and they're happening now. It's less about potential harms and future trends than about the actual realized risk happening right here, right now.

Jonathan Cannon: We haven't talked about judgment much, but I think your answer in our discussion would indicate that at least in the best reading, the scope of judgment is constrained by the specific criteria that are being applied. That doesn't give a roving mandate or authority to the Administrator to pick up extraneous considerations.

Lisa, your remarks indicated, and I totally agree, that the basic holding in *Massachusetts* on GHGs as air pollutants is not in high danger of being overruled. But there are a couple of warning signs to suggest that there is some vulnerability there. They are more political than they are substantive.

None of the five justices in the majority in the *Massachusetts* decision is still on the Court. Three of the dissenters are still on the Court, and two of those dissenters—Justice Alito and Justice Thomas—have continued to voice disagreement with *Massachusetts*. Since *Massachusetts*, there have been other additions to the Court who might hold similar views. How strong is the precedential rule against reviewing statutory interpretations?

Lisa Heinzerling: I was careful not to say, and maybe I should have made this an introductory qualifier, but I'm not sure whether they will overrule *Massachusetts*. I was trying to make the arguments that EPA might make that don't seem to depend on overruling *Massachusetts*.

Do they have legal arguments? I think they could say some legal words, but I don't think they have good legal arguments. With respect to the decision about whether to overrule *Massachusetts*, clearly the Supreme Court is in a mood about the regulatory state and about administrative law. Not in a friendly sort of collegial mood. So, I don't know whether they would overrule *Massachusetts*.

If they were given a chance, the case would have to be teed up that raised that question. They would have to, I suppose, think that there would be no other way of getting at the kind of regulatory playing field that they want short of overruling *Massachusetts*. They're in the middle of overruling, quite honestly, a lot of precedent on the regulatory

25. Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. at 66505.
26. *Id.*

and administrative state. I don't know how much appetite they have for more.

The one thing I would note, and a lot of people don't really focus on this about *Massachusetts*, is that I think it's an example of a philosophy that the current Court exhibits. In *Massachusetts*, the five justices in the majority said the language of the statute was clear. That it clearly included GHGs as air pollutants. If you want to think about statutory purpose, the purpose is clear in trying to bring along pollutants that emerged after the original enactment of the statute.

The Court dissenters would have deferred under *Chevron*. They would have deferred even though the Agency had made a highly consequential determination that GHGs weren't even covered by the CAA; thus, ensuring no regulation by EPA. Under EPA's most powerful statute for air pollution, obviously, no regulation would ensue based on EPA's decision not to regulate.

The fact is the dissenters would have deferred to EPA's decision without even mentioning the major questions idea, which was kicking around then. So, the case does seem to illustrate the skew of that idea that agencies shouldn't answer major questions, that four conservative justices would have given EPA the power to say no to regulation. Those justices wouldn't have been inclined or wouldn't be inclined today to say yes to regulation.

Jonathan Cannon: That's reassuring. It is interesting that *Food & Drug Administration v. Brown & Williamson Tobacco Corp.*,[27] which was a precursor of the major questions doctrine that emerged in *West Virginia*, was mentioned by the majority opinion in *Massachusetts*, but it was kind of brushed aside. Of course, then the major questions doctrine wasn't fleshed out as it would be in *West Virginia*. In *Massachusetts*, the Court limited *Brown & Williamson* to the particular facts in its analysis. But it's made me wonder, if that argument came back today, how the Court would think about it.

Here's an audience question for the panel: If EPA is successful in dismantling CAA authority to regulate GHGs, wouldn't that undermine the federal government's attempt to preempt state climate action (e.g., the "state overreach" Executive Order[28])?

Lisa Heinzerling: I was looking at the language of the provision that preempts state regulation of auto emissions. That language is especially relevant for motor vehicles, which we've also been talking about today. The preemption of state law or state standards for motor vehicles applies for vehicles subject to regulation, I believe. It strikes me that there's at least some ambiguity about, if it happened, that there's no regulation of GHGs under the CAA, then would that preemptive authority kick in?

Jonathan Cannon: We have a science question for you, Phil. How exact is the current science on event attribution (i.e., if GHG emissions are elevated in a certain part of the country)? Has that been shown to have unique impacts in adjacent areas, or is the event attribution at a different level or scale?

Phil Duffy: Let me address what I think the question is trying to ask. Event attribution looks at particular extreme weather events. For example, Hurricane Harvey was one event for which several event attribution studies were performed. What event attribution tries to do is answer the question of how much more likely is this event, or an event like this, because of human-caused climate change versus what we call a pre-industrial climate, a climate without additional GHGs in the atmosphere?

For the purpose of event attribution or the purposes of societal impacts of climate change generally, it doesn't matter where the emissions occur geographically, because the gases quickly become more or less uniform everywhere in the atmosphere.

Event attribution is an emerging science. I think it's getting better. What I would say is, first of all, some of the events we've seen recently have been so extreme that they would have been virtually impossible without human GHG emissions. There was a heat wave, for example, several years ago in the Pacific Northwest where temperature records were broken by absolutely enormous, unprecedented margins.[29] Event attribution studies were done on that event, and concluded that an event like that would have been virtually impossible absent prior human GHG emissions.

The other thing I'll reiterate is that the endangerment finding doesn't hinge upon the success or the fidelity of event attribution studies. That's way above the bar that's set by the CAA because, remember, the language is "may reasonably be anticipated to endanger the public health." Here, we're talking about not anticipated harms, but realized harms.

The evidence for realized harms also goes way beyond event attribution. If you look globally, there have been enormous increases in extreme weather events of all sorts. One can say that without delving into particular events and the origin or causes of particular events.

Jonathan Cannon: Here's a question on a topic that we haven't really dealt with: Can you comment at all on the potential effect that the new regulatory requirements of H.R. 1[30] that just passed the House would have? I certainly can't. I don't know the contents of the bill. It seems a mystery to me. Maybe others have a better idea.

27. 529 U.S. 129 (2000).
28. Protecting American Energy From State Overreach, Exec. Order No. 14260, 90 Fed. Reg. 15513 (Apr. 14, 2025).
29. *Western North American Extreme Heat Virtually Impossible Without Human-Caused Climate Change*, World Weather Attribution (July 7, 2021), https://www.worldweatherattribution.org/western-north-american-extreme-heat-virtually-impossible-without-human-caused-climate-change/.
30. One Big Beautiful Bill Act, H.R. 1, 119th Cong. (2025).

And there is a similar question related to the potential effect of the Inflation Reduction Act, which has been on the books for some time, although it's probably amended by H.R. 1. What effects would the Inflation Reduction Act have on any of the arguments that might be advanced by the new Administration for endangerment?

Lisa Heinzerling: I haven't seen the language that passed in H.R. 1. But with the Inflation Reduction Act, assuming this piece of it hasn't been changed and only the grants have gone away, it did define "air pollutant" under the amendments that that Act made to the CAA. It defined air pollutants as the six pollutants that EPA had looked at in the endangerment finding.

So, there's a way in which I think it's fair today to say that signals a congressional condoning of that definition or recognition, an acceptance of a definition of GHGs as air pollutants. Of course, it was passed through reconciliation, which can't actually change the law, but it could be a recognition about what the status of the law was and a kind of acceptance of it, I think.

Jonathan Cannon: I know there have been debates in the current reconciliation process about how far Congress might be able to go in making changes that might appear to be substantive. I don't know how that's affected the climate change arena, but it could. Congress is a wild card in all of this.

Another question: doesn't the endangerment language in the stationary source provisions of the CAA require a "significant" contribution to pollution endangering health or welfare? Isn't that a higher standard than for motor vehicles? That goes back to your earlier comments, Lisa, that at least in §202 there's no such language. What do we say about this sort of differentiation among types of sources in terms of the contribution language?

Lisa Heinzerling: I thought I remembered some of that was due to the kinds of sources that could be regulated under the stationary source provisions and that some of them could be quite small sources, where Congress added a little bit of an extra connection to air pollution that endangers. That's what I meant when I said that there's no qualifier in §202(a)(1). I meant the "significant" qualifier of other provisions.

In that sense, at the very least we can say that Congress chose not to even add that qualifier, which actually in EPA's hands hasn't been very restrictive on regulating. It doesn't even have that language in the language we've been talking about with respect to §202(a)(1) and the original endangerment finding.

Phil Duffy: I would add that from a scientific perspective, the GHG emissions from stationary sources in the United States have been a significant contributor to climate change. Cumulatively, the United States is, among the nations, the largest emitter of GHGs. So, even if there is a significance test in the law, I think the science would meet that test.

Jonathan Cannon: Here's one for Phil. Administrator Zeldin's congressional testimony this week leaned into the suggestion that EPA's finding was an error because it aggregated six well-mixed gases.[31] EPA treated all these gases as one rather than separating them out, although CO_2 and methane are the dominant ones. Do you see that argument having any potential force either legally or scientifically?

Phil Duffy: I think that's mainly a legal question, and maybe Lisa would want to opine on it. But the individual gases, CO_2 and methane certainly, have enough impact to have attributable harms. CO_2 was responsible for a little less than half of the warming we're experiencing today. Methane contributes somewhat less, about half a degree of warming. So, a substantial proportion of the warming that we're seeing today.

Lisa Heinzerling: I don't understand exactly what the argument is. There is something at least interesting about that choice by EPA, to talk about six well-mixed GHGs as the air pollutant of concern. But in any event, at least in my opinion, you'd be looking at whether the general pollution, not a single pollutant, causes endangerment. The D.C. Circuit actually didn't rule on this part of the endangerment finding because there was nobody who appeared to be injured by it.

Jonathan Cannon: Here's another question. Administrator Zeldin's approach to EPA's mission is articulated in the "Powering the Great American Comeback Initiative."[32] While it mentions protecting human health and the environment, it focuses on driving economic growth through energy dominance—not renewable energy—and permitting reform, giving more authority to states where there may be influences not to protect the environment, or health, or environmental justice, and bolstering the American auto industry but not electric vehicles.

Given this approach and that the Administration does not set legal approaches as a high priority, is there any real expectation that the endangerment finding will survive? In other words, is EPA's and the Administration's process simply a distraction? Not meaning to sound too pessimistic or dismissive of the perspectives offered, which are well-reasoned if EPA was serious about its role to protect human health and the environment.

This seems to raise questions about whether legal boundaries are constraining in the current environment. I'm not sure it's a question that lawyers or scientists are able to answer.

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31. Jean Chemnick, *Zeldin's New Attack on Endangerment Finding: It Combined 6 GHGs*, E&E News (May 23, 2025), https://www.eenews.net/articles/zeldins-new-attack-on-endangerment-finding-it-combined-6-ghgs/.
32. Press Release, U.S. EPA, EPA Administrator Lee Zeldin Announces EPA's "Powering the Great American Comeback" Initiative (Feb. 4, 2025), https://www.epa.gov/newsreleases/epa-administrator-lee-zeldin-announces-epas-powering-great-american-comeback.

Phil Duffy: There's a lot going on in that question. One thing that it touches on is that implicit in a lot of these arguments put forth by the Administration is that there is some inherent trade off between prosperity and a healthy environment. I don't think that there's actually any basis for making that assumption.

In fact, there's plenty of evidence, certainly in the long run, that a healthy climate—a safe and stable climate—is necessary to human welfare and necessary to human prosperity. I think it's important to challenge the underlying assumption that we can't have both a safe and stable climate and economic prosperity, that we can't respect the environment and also respect the need for prosperity.

I'm talking to you from the state of California, which for decades has been a leader in environmental protection and yet has had a very vibrant economy. So, both in theory and empirically, I don't think there's any basis for the assumption that there's an inherent trade off between a safe environment and a strong economy.

Lisa Heinzerling: It strikes me that it's possible that we could focus too much on something like the endangerment finding while other rules are being undone. The endangerment finding is kind of high-profile, sexy, applies to a large problem. It's a keystone decision that attaches to a lot of other decisions. I'm not taking any of that away from it.

But in the meantime, the Administration is also doing a lot of other things and not doing a lot of things. It's taking back a lot of other decisions that are also really important. I wonder whether it's possible to overfocus on this if it's to the exclusion of others.

Jonathan Cannon: It's important to recognize, as Phil mentioned, that there is a larger rhetorical context that's going on here. I once wrote a law review article on how presidents talk about the environment.[33] Across many administrations, until quite recently, the standard presidential rhetoric for both Republicans and Democrats was that we could have both a thriving economy and a healthy environment. The argument was that there was no contradiction. In fact, they were mutually supporting in the way that Phil has suggested.

That rhetoric, at least in recent administrations, certainly the current Administration, has dropped away. This adversarial confrontation between business interests and groups favoring the environment or environmental protection has become more intense.

Lisa Heinzerling: I would also add there's a tension between economics and environmental protection, but it seems very important to the new leadership at EPA to undo this scientific finding not just because it's a linchpin for other rules, but because it's an affront in a way. It feels like the very fact of the finding that humans are endangering public health and welfare with GHGs is something that needs to be rooted out.

Jonathan Cannon: I think that's clear. It's a symbolic campaign as well as a substantive campaign. It's clear from the language that Administrator Zeldin used: "a dagger straight into the heart of the climate change religion." I mean, it's like killing a vampire. It's a rhetoric that escalates the dispute into a metaphysical realm almost.

Phil Duffy: If I may, I can offer another anecdote related to the question I was riffing on earlier about potential trade offs between economics and regulation. I'm reminded of an analysis done by Art Rosenfeld, who was a member of the California Energy Commission a while ago.[34] He did a study of how home appliance energy standards affected the cost of refrigerators. He plotted over time the trajectory of these costs.

What the study showed is that the normalized inflation-adjusted costs of refrigerators peaked at the time that energy efficiency regulations were implemented. There was a series of these regulations, some federal and some state. The study clearly showed that the implementation of energy-efficiency standards completely changed the trend in refrigerator costs. Refrigerator costs had been going up, up, up in price and all of a sudden started going down, down, down in price, even as they became larger over time. This is over decades. The lesson he extracted from that, which I think applies more broadly, is that regulation can stimulate innovation. What was going on with refrigerators is that the appliance makers were selling refrigerators, they were making a healthy profit, and they had no reason to revisit the design. When they had to do that because efficiency standards were imposed, they found not surprisingly that the technology had advanced and they could do things more efficiently and do things better. It's actually cheaper and better for the consumer.

Again, I don't think there's empirical support for the notion that regulation has to increase costs and that there has to be this trade off between environmental protection and economic prosperity.

Jonathan Cannon: That's true, and Lisa's done a lot of work on this. There are studies that show that, in setting regulations, EPA regularly overstates the cost of the regulation on the regulated entity. That's for the exact reason that you just mentioned, Phil. Companies find ways to comply that are cheaper and more efficient and can lead to technological innovations and other benefits to society as well.

Maybe this brings this all crashing down to earth, but I have another question related to the earlier question about what constraints the law applies here and how the constraints will be made effective. It's a procedural point. Should we be concerned that EPA may circumvent ordi-

33. Jonathan Cannon & Jonathan Riehl, *Presidential Greenspeak: How Presidents Talk About the Environment and What It Means*, 23 Stan. Env't L.J. 195 (2004).

34. *See, e.g.*, Arlan Brucal & Michael J. Roberts, *Do Energy Efficiency Standards Hurt Consumers? Evidence From Household Appliance Sales*, 96 J. Env't Econ. & Mgmt. 88 (2019), https://doi.org/10.1016/j.jeem.2019.04.005.

nary procedures of notice-and-comment rulemaking? For example, by issuing an interim final rule before the Agency has taken comments into account and issued a response to comments and so forth—maybe by citing the "good cause" exemption under the Administrative Procedure Act. If so, how would that play out?

Lisa Heinzerling: I'm tempted to say, go for it. Try. Saying what? We have good cause? Because it's an emergency, we have to now change our 50-year approach to determining endangerment?

Just so everybody's on board with this discussion, the Administrative Procedure Act creates certain exceptions to the requirement of what's called informal rulemaking—the kind of rulemaking that requires notice and comment, public comment, before a rule is issued. One of the reasons for avoiding notice and comment is so-called good cause—that there's some kind of an emergency, as the courts have interpreted it.

The Trump Administration has started to make the case that an "unlawful" rule can be rescinded without notice and comment because there's good cause. That it's almost an emergency to have an unlawful rule and, therefore, they can undo it without the procedures required by law.

That's not the kind of argument that has fared very well in the courts. I think in a way, you want EPA to do this with all the required processes, and deliberation, and public input, and so forth. By the same token, if EPA doesn't do that process, my guess would be at least the lower courts would intervene. At least at the level of the D.C. Circuit, they would quickly be undone. The wild card, as always, is the Supreme Court.

Jonathan Cannon: Right. And the question of what might occur while this is all playing out.