

**[ORAL ARGUMENT NOT YET SCHEDULED]**

**IN THE UNITED STATES COURT OF APPEALS  
FOR THE DISTRICT OF COLUMBIA CIRCUIT**

No. 15-1385 (consolidated with Nos. 15-1392,  
15-1490, 15-1491, and 15-1494)

---

MURRAY ENERGY CORPORATION,  
Petitioner,

v.

ENVIRONMENTAL PROTECTION AGENCY,  
Respondent.

---

On Petition for Review of Final Agency Action of the  
United States Environmental Protection Agency

---

**CORRECTED FINAL BRIEF OF THE INSTITUTE FOR POLICY  
INTEGRITY AT NEW YORK UNIVERSITY SCHOOL OF LAW AS  
AMICUS CURIAE IN SUPPORT OF RESPONDENT**

---

Richard L. Revesz  
Denise A. Grab  
Jack Lienke  
Michael A. Livermore  
Jason A. Schwartz  
INSTITUTE FOR POLICY INTEGRITY  
139 MacDougal Street, Room 319  
New York, NY 10012  
(212) 992-8932  
richard.revesz@nyu.edu  
*Counsel for Amicus Curiae*  
*Institute for Policy Integrity*

August 4, 2016

**CERTIFICATE AS TO PARTIES, RULINGS,  
AND RELATED CASES**

All parties, intervenors, and *amici* appearing in this case are listed in the opening briefs for Petitioners, except for the following *amicus curiae*: the American Thoracic Society, the California Air Resources Board, the Institute for Policy Integrity, the National Association of Home Builders, and the American Lung Association.

References to the rulings under review appear in Respondent's brief.

These consolidated cases were not previously before this Court or any other court, and counsel for *amicus curiae* are not aware of any related cases currently pending before this or any other court.

**STATEMENT REGARDING SEPARATE BRIEFING,  
AUTHORSHIP, AND MONETARY CONTRIBUTIONS**

Policy Integrity is aware that Circuit Rule 29(d) instructs it to join in a single brief with other amici curiae for Respondent to the extent practicable. D.C. Cir. Rule 29(d). Policy Integrity is also aware that the California Air Resources Board recently filed a notice of intent to participate as an amicus in support of Respondent in this case.

However, the California Air Resources Board has a pending motion for an extension of time to complete its brief. Additionally, the California Air Resources Board has indicated that its brief will likely be joined by state governments, in which case the brief would not be subject to the coordination requirement of Circuit Rule 29(d). *See* D.C. Circuit, Handbook of Practice and Internal Procedures 39 (2016) (noting that a “governmental entity is not required to file a joint brief with other amici” and that “a governmental entity includes . . . a state”). For these reasons, it is not practicable for Policy Integrity to join in a single brief with the California Air Resources Board.

Under Federal Rule of Appellate Procedure 29(c), the Institute for Policy Integrity states that no party’s counsel authored this brief in whole or in part, and no party or party’s counsel contributed money

intended to fund the preparation or submission of this brief. No person—other than the amicus curiae, its members, or its counsel—contributed money intended to fund the preparation or submission of this brief.

## **RULE 26.1 DISCLOSURE STATEMENT**

The Institute for Policy Integrity (“Policy Integrity”) is a not-for-profit organization at New York University School of Law. Policy Integrity is dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy. Policy Integrity has no parent companies. No publicly-held entity owns an interest of more than ten percent in Policy Integrity. Policy Integrity does not have any members who have issued shares or debt securities to the public.

## TABLE OF CONTENTS

CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES .	i
STATEMENT REGARDING SEPARATE BRIEFING, AUTHORSHIP, AND MONETARY CONTRIBUTIONS.....	ii
RULE 26.1 DISCLOSURE STATEMENT .....	iv
TABLE OF AUTHORITIES.....	vii
GLOSSARY OF ACRONYMS AND ABBREVIATIONS .....	ix
STATUTES AND REGULATIONS.....	1
INTEREST OF AMICUS CURIAE.....	1
SUMMARY OF ARGUMENT.....	3
ARGUMENT .....	6
I. CONSIDERING REGULATORY COSTS WOULD NOT LEAD TO A LESS STRINGENT STANDARD .....	6
A. EPA’s 70 Parts per Billion Standard Is Cost-Benefit Justified ..	7
B. An Ozone Standard Set by Reference to Cost-Benefit Analysis Would Be <i>More</i> Stringent, Not Less Stringent.....	10
II. THE ALTERNATIVE COST ANALYSIS CITED BY PETITIONERS IS NOT CREDIBLE .....	11
A. The NERA Report Exaggerates the Cost of “Unidentified Controls” .....	12
B. NERA’s Estimates of Job Losses and Other Market Impacts Are Speculative and Contaminated by Its Unfounded Cost Estimates	20
III. RECENT EMPIRICAL STUDIES CONTRADICT PETITIONERS’ CLAIM THAT REGULATORY STUDIES NEGATIVELY AFFECT PUBLIC HEALTH .....	25

CONCLUSION ..... 30

CERTIFICATE OF COMPLIANCE WITH WORD LIMITATION ..... 31

CERTIFICATE OF SERVICE

## TABLE OF AUTHORITIES

### Cases

<i>California v. Watt</i> , 712 F.2d 584 (D.C. Cir. 1983).....	24
<i>Chevron v. Natural Res. Def. Council</i> , 467 U.S. 834 (1984) .....	23
<i>Ctr. for Sustainable Econ. v. Jewell</i> , 779 F.3d 588 (D.C. Cir. 2015) .....	24
<i>Michigan v. EPA</i> , 135 S. Ct. 2699 (2015) .....	23
* <i>Whitman v. American Trucking</i> , 531 U.S. 457 (2001) ...	3, 5, 6, 7, 25, 26, 27

### Statutes

42 U.S.C. § 112(n)(1) .....	23
42 U.S.C. § 7409(b) .....	25

### Federal Register

80 Fed. Reg. 65,292 (Oct. 26, 2015) .....	7
Exec. Order No. 12,866, 58 Fed. Reg. 51,735 (Oct. 4, 1993).....	7
Exec. Order No. 13,563, 76 Fed. Reg. 3821 (Jan. 21, 2011) .....	7

### Other Authorities

Raj Chetty et al., <i>The Association Between Income and Life Expectancy in the United States, 2001-2014</i> , 315 J. of the Am. Med. Ass'n 1750 (2016).....	28
EPA, <i>Economy-Wide Modeling: Social Cost and Welfare White Paper</i> , Prepared for the U.S. EPA Science Advisory Board Panel on Economy-Wide Modeling of the Benefits and Costs of Environmental Regulation (2015).....	22
EPA, <i>Guidelines for Preparing Economic Analyses</i> (2014) .....	9, 24
*EPA, <i>Regulatory Impact Analysis of the Final Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone</i> (2015).....	4, 8, 9, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23
EPA, <i>Responses to Significant Comments on the 2014 Proposed Rule on the National Ambient Air Quality Standards for Ozone</i> (2015).....	6, 12, 19

Jeremy Fisher et al., Synapse Energy Economics, <i>Clearing Up the Smog: Debunking Industry Claims that We Can't Afford Healthy Air</i> (2015).....	17, 18, 20
Ted Gayer & Emily Parks, Economic Studies at Brookings, <i>Cash for Clunkers: An Evaluation of the Car Allowance Rebate System</i> (2013).....	17, 19
Ichiro Kawachi et al., <i>Money, Schooling, and Health: Mechanisms and Causal Evidence</i> , 1186 <i>Annals of the N.Y. Acad. of Sci.</i> 56 (2010) .....	29
Michael A. Livermore & Richard L. Revesz, <i>Rethinking Health-Based Environmental Standards and Cost-Benefit Analysis</i> , 46 <i>Env'tl. L. Rep.</i> 10,674 (2016) .....	11
Michael A. Livermore & Richard L. Revesz, <i>Rethinking Health-Based Environmental Standards</i> , 89 <i>N.Y.U. L. Rev.</i> 1184 (2014) .....	2, 29, 30
NERA Economic Consulting, <i>Assessing Economic Impacts of a Stricter National Ambient Air Quality Standard for Ozone</i> (2014).....	18
NERA Economic Consulting, <i>Economic Impacts of a 65 ppb National Ambient Air Quality Standard for Ozone</i> (2015).....	4, 11, 12, 17, 18, 20, 21
Office of Mgmt. & Budget, <i>Circular A-4</i> (2003) .....	10, 25
James M. Poterba, Steven F. Venti & David A. Wise, <i>The Asset Cost of Poor Health</i> (Nat'l Bureau of Econ. Research, Working Paper No. 16,389, 2010) .....	28
Richard L. Revesz & Michael A. Livermore, <i>Retaking Rationality: How Cost-Benefit Analysis Can Better Protect the Environment and Our Health</i> (2008).....	2, 27
James P. Smith, <i>The Impact of Socioeconomic Status on Health over the Life-Course</i> , 42 <i>J. of Hum. Res.</i> 739 (2007) .....	28

\* Indicates sources on which brief chiefly relies

## GLOSSARY OF ACRONYMS AND ABBREVIATIONS

Pursuant to Circuit Rule 28(a)(3), the following is a glossary of acronyms and abbreviations used in this brief:

Brookings Report	Ted Gayer & Emily Parks, Economic Studies at Brookings, <i>Cash for Clunkers: An Evaluation of the Car Allowance Rebate System</i> (2013)
EPA	Environmental Protection Agency
NERA	NERA Economic Consulting
NERA Report	NERA Economic Consulting, <i>Economic Impacts of a 65 ppb National Ambient Air Quality Standard for Ozone</i> (2015)
Ozone Regulatory Impact Analysis	EPA, <i>Regulatory Impact Analysis of the Final Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone</i> (2015)
Policy Integrity	Institute for Policy Integrity
Responses to Comments	EPA, <i>Responses to Significant Comments on the 2014 Proposed Rule on the National Ambient Air Quality Standards for Ozone</i> (2015)
Synapse Report	Jeremy Fisher et al., Synapse Energy Economics, <i>Clearing Up the Smog: Debunking Industry Claims that We Can't Afford Healthy Air</i> (2015)

## STATUTES AND REGULATIONS

All applicable statutes and regulations are included in the Statutory Addendum to the Brief for Respondent.

## INTEREST OF AMICUS CURIAE

Pursuant to this Court's April 5, 2016 order (Doc. 1607246), the Institute for Policy Integrity at New York University School of Law<sup>1</sup> ("Policy Integrity") files this *amicus curiae* brief in support of Respondent.

Policy Integrity is a nonprofit think tank dedicated to improving government decisionmaking through advocacy and scholarship in administrative law, economics, and policy, focusing on environmental issues. Policy Integrity has produced scholarship on the legality, economics, and design of Clean Air Act regulation and has filed *amicus* briefs in this Court and the Supreme Court regarding the Environmental Protection Agency's ("EPA") Clean Air Act authority.

---

<sup>1</sup>This brief does not purport to represent the views of New York University School of Law, if any.

Additionally, Policy Integrity's Director, Richard L. Revesz,<sup>2</sup> and Senior Advisor, Michael A. Livermore,<sup>3</sup> have written extensively on cost-benefit analysis and its application to the regulatory process. Their recent article *Rethinking Health-Based Environmental Standards* rebuts the conventional wisdom that cost-conscious National Ambient Air Quality Standards ("NAAQS") would necessarily be less environmentally protective than cost-blind standards. Michael A. Livermore & Richard L. Revesz, *Rethinking Health-Based Environmental Standards*, 89 N.Y.U. L. Rev. 1184 (2014).<sup>4</sup> Additionally, their book *Retaking Rationality* challenges the popular but unproven idea that regulatory costs, by reducing wealth, negatively affect public health. Richard L. Revesz & Michael A. Livermore, *Retaking Rationality: How Cost-Benefit Analysis Can Better Protect the Environment and Our Health* (2008). Policy Integrity's brief builds upon this scholarship to argue that objections to the 70 parts per billion ozone

---

<sup>2</sup> Lawrence King Professor of Law and Dean Emeritus, New York University School of Law.

<sup>3</sup> Associate Professor of Law, University of Virginia School of Law.

<sup>4</sup> Available at <http://www.nyulawreview.org/issues/volume-89-number-4/rethinking-health-based-environmental-standards>.

standard on cost-benefit analysis grounds are both legally and factually meritless.

### SUMMARY OF ARGUMENT

Industry Petitioners fault EPA for failing to consider the “adverse economic, social, and energy impacts” of its revised ozone NAAQS, implying that if EPA *had* considered such impacts, it would have selected a less stringent standard. Industry Pet’rs Br. 31–32. “Adverse impact” is, of course, a euphemism for costs, and the Supreme Court’s decision in *Whitman v. American Trucking* expressly precludes EPA from using implementation costs to justify a NAAQS that does not adequately protect public health. 531 U.S. 457, 471 (2001). But even if EPA *did* consider costs as part of the NAAQS-setting process, it would not, in this case, have grounds to set a less stringent standard. On the contrary, EPA’s Regulatory Impact Analysis shows not only that the benefits of a 70 parts per billion standard outweigh the costs, but also that the agency could generate even greater net benefits for society by setting a *more* stringent standard of 65 parts per billion. See EPA, *Regulatory Impact Analysis of the Final Revisions to the National*

*Ambient Air Quality Standards for Ground-Level Ozone at ES-15* (2015) [hereinafter “Ozone Regulatory Impact Analysis”].<sup>5</sup>

Perhaps recognizing that EPA’s cost projections are not favorable to their case, Industry Petitioners point instead to much higher cost estimates generated by NERA Economic Consulting (“NERA”) in a 2015 report for the National Association of Manufacturers. Industry Pet’rs Br. 35; NERA Economic Consulting, *Economic Impacts of a 65 ppb National Ambient Air Quality Standard for Ozone* (2015) [hereinafter “NERA Report”].<sup>6</sup> The conclusions of that non-peer-reviewed document, however, are the product of flawed and unscientific methodological choices, and, unlike EPA’s calculations, they are entitled to no deference by this court.

State Petitioners, meanwhile, argue that even if EPA cannot directly consider costs when setting standards, it must at least consider any negative impacts those costs will have on public health. State Pet’rs Br. 48–49. They claim their argument is supported by Justice Breyer’s

---

<sup>5</sup> Available at

<https://www3.epa.gov/ttn/naaqs/standards/ozone/data/20151001ria.pdf>.

<sup>6</sup> Available at [http://www.nam.org/Issues/Energy-and-Environment/Ozone/Economic-Impacts-of-a-65-ppb-NAAQS-for-Ozone-\(NERA\).pdf](http://www.nam.org/Issues/Energy-and-Environment/Ozone/Economic-Impacts-of-a-65-ppb-NAAQS-for-Ozone-(NERA).pdf).

concurrence in *Whitman*, which noted that efforts to restrict public health need not “lead to deindustrialization” because “[p]reindustrial society was not a very healthy society.” *Whitman*, 531 U.S. at 496 (Breyer, J., concurring). But the majority in *Whitman* expressly rejected the idea that EPA could work costs into the NAAQS-setting process by rebranding them as health risks. *Id.* at 466–69. And while Justice Breyer did not join that portion of the majority’s opinion, even he seemed to think consideration of cost-related health effects would be permissible only when necessary to avoid “extreme results” of a sort not posed by this rulemaking. *Id.* at 495–96. Furthermore, empirical studies conducted in the years since *Whitman* was decided have cast serious doubt on the view that regulatory costs can, by reducing wealth, negatively affect public health.

## ARGUMENT

### I. CONSIDERING REGULATORY COSTS WOULD NOT LEAD TO A LESS STRINGENT STANDARD

Petitioners acknowledge that, pursuant to the Supreme Court's ruling in *Whitman v. American Trucking*, 531 U.S. 457 (2001), "EPA cannot consider the costs of implementation when establishing or revising NAAQS." Industry Pet'rs Br. 31. But they nevertheless argue that the agency is required to consider "the overall adverse economic, social, and energy impacts of the standards." *Id.* As the government's brief rightly notes, such "adverse impacts" are simply costs by another name, and *Whitman* forbids EPA from using them to justify a NAAQS that is insufficiently stringent to protect the public health. *See* EPA Br. at 120–23. Indeed, as EPA explained in the rulemaking process, the agency carefully avoided considering costs in setting the NAAQS standard because to do so would be reversible error under *Whitman*. *See* EPA, *Responses to Significant Comments on the 2014 Proposed Rule on the National Ambient Air Quality Standards for Ozone* 353 (2015) (noting that "EPA has not considered the costs suggested by the

commenters” due to the prohibition in *Whitman*, 531 U.S. at 47[1] n.4) [hereinafter “Responses to Comments”].<sup>7</sup>

But even if EPA *were* able to consider regulatory costs when determining the appropriate stringency of NAAQS, those costs would not, in this case, lead the agency to impose a weaker standard. On the contrary, EPA’s Regulatory Impact Analysis for the revised ozone NAAQS revision shows that a 65 parts per billion standard would likely generate greater net benefits than a 70 parts per billion standard.<sup>8</sup> In other words, a standard set by reference to cost-benefit analysis would be *more* stringent than the one EPA selected.

**A. EPA’s 70 Parts per Billion Standard Is Cost-Benefit Justified**

Although EPA does not take regulatory costs into account when setting or revising NAAQS, the agency nevertheless prepares a

---

<sup>7</sup> Available at

[https://www3.epa.gov/ttn/naaqs/standards/ozone/data/2015\\_10\\_01\\_03naaqs\\_rtc.pdf](https://www3.epa.gov/ttn/naaqs/standards/ozone/data/2015_10_01_03naaqs_rtc.pdf).

<sup>8</sup> Note that, consistent with *Whitman*’s prohibition on considering costs, EPA did not consider the Regulatory Impact Analysis in setting the ozone NAAQS standards, going so far as to docket it separately from the rest of the NAAQS record. 80 Fed. Reg. 65,292, 65,444 (Oct. 26, 2015). EPA conducted the separate Regulatory Impact Analysis in order to satisfy regulatory review requirements under Executive Orders. See Exec. Order No. 12,866, 58 Fed. Reg. 51,735 (Oct. 4, 1993); Exec. Order No. 13,563, 76 Fed. Reg. 3821 (Jan. 21, 2011).

regulatory impact analysis for such rulemakings. In addition to fulfilling EPA's obligations under Executive Orders 12,866 and 13,563, these analyses are intended to aid states in identifying cost-effective strategies for NAAQS implementation. *See Ozone Regulatory Impact Analysis at ES-1 to ES-2.*

With respect to the 2015 revision of the ozone NAAQS, EPA found that, for all states other than California, a standard of 70 parts per billion would impose annual costs of \$1.4 billion as of 2025, while generating annual health benefits worth \$2.9 to \$5.9 billion. *Id.* at ES-15 tbl.ES-5. These projected benefits include the prevention of between 316 and 660 premature deaths from ozone and particulate matter exposure, as well as between 28 and 260 non-fatal heart attacks and 630 asthma-related emergency room visits. *Id.* at ES-16 tbl.ES-6.<sup>9</sup> EPA's methods for quantifying and monetizing these benefits are based on peer-reviewed economic studies and have been used in its rulemakings for decades, under administrations of both parties. *Ozone Regulatory Impact Analysis at 6-9* (noting that the approach to

---

<sup>9</sup> EPA also identified additional health benefits that could not be quantified due to data constraints, such as avoided emergency room visits and hospitalizations caused by direct exposure to nitrogen dioxide, an ozone precursor. *Id.* at 6-53 to 6-54.

calculating benefits in the Ozone Regulatory Impact Analysis “is the standard method that EPA uses . . . and has been used in several recent analyses published in the peer reviewed scientific literature as well”); EPA, *Guidelines for Preparing Economic Analyses* 1-1 (2014) (noting that agency’s current guidelines are the latest iteration of a document first issued in 1983).<sup>10</sup>

Because several areas in California are subject to significantly longer compliance timelines than the rest of the country, EPA prepared a separate analysis for that state and found that, under a 70 parts per billion standard, California would, post-2025, face annual costs of \$0.8 billion and generate annual benefits of between \$1.2 and \$2.1 billion. Ozone Regulatory Impact Analysis at ES-2 (explaining why California is subject to a separate analysis); ES-18 tbl.ES-9 (showing California-specific costs and benefits). Thus, in both California and the remainder of the United States, EPA found that the health benefits of a 70 parts per billion ozone standard would outweigh the costs of implementation.

---

<sup>10</sup> Available at [https://yosemite.epa.gov/ee/epa/erm.nsf/vwAN/EE-0568-50.pdf/\\$file/EE-0568-50.pdf](https://yosemite.epa.gov/ee/epa/erm.nsf/vwAN/EE-0568-50.pdf/$file/EE-0568-50.pdf).

**B. An Ozone Standard Set by Reference to Cost-Benefit Analysis Would Be *More* Stringent, Not Less Stringent**

In addition to showing that a 70 parts per billion standard is cost-benefit justified, EPA's Regulatory Impact Analysis suggests that the agency could have generated even greater net benefits by limiting ambient concentrations of ozone to 65 parts per billion.<sup>11</sup> Thus, had EPA calibrated the stringency of the NAAQS using cost-benefit analysis, as Petitioners urge, it likely would have set a *more* stringent standard.

As discussed above, EPA found that the benefits of a 70 parts per billion standard substantially outweighed the costs. More specifically, the midpoint of EPA's projected range of annual net benefits was \$0.85 billion in California and \$3 billion in the remainder of the country. *See* Ozone Regulatory Impact Analysis at ES-15 tbl.ES-5 & ES-18 tbl.ES-9. But EPA also assessed the costs and benefits of an alternative standard of 65 parts per billion and projected even larger net benefits under that option. *Id.* In California, the midpoint of projected annual net benefits was \$1.75 billion, and in the remainder of the United States, the

---

<sup>11</sup> Net benefits are the difference between a rule's projected benefits and its projected costs. Office of Mgmt. & Budget, *Circular A-4* at 10 (2003), *available at* [https://www.whitehouse.gov/sites/default/files/omb/assets/regulatory\\_matters\\_pdf/a-4.pdf](https://www.whitehouse.gov/sites/default/files/omb/assets/regulatory_matters_pdf/a-4.pdf).

midpoint was \$6.5 billion. *Id.* Thus, a standard set according to cost-benefit analysis criteria would have been *more* stringent than the one EPA chose, not less stringent. See Michael A. Livermore & Richard L. Revesz, *Rethinking Health-Based Environmental Standards and Cost-Benefit Analysis*, 46 *Envtl. L. Rep.* 10,674, 10,678 & tbl.2 (2016) (“Based on the agency’s analysis, a more stringent standard would be justified.”).

## **II. THE ALTERNATIVE COST ANALYSIS CITED BY PETITIONERS IS NOT CREDIBLE**

To support their contention that a cost-conscious ozone NAAQS would be weaker than the purely health-based standard set by EPA, Petitioners cite a 2015 study by NERA Economic Consulting. Industry Pet’rs Br. 35. That study, which NERA prepared for the National Association of Manufacturers, estimated that a 65 parts per billion standard would have regulatory costs over six times larger than EPA’s estimates. NERA Report at 9–10. The NERA Report is, first of all, irrelevant to the standard adopted in this case, because it examines the effects only of a 65 parts per billion ozone standard, not the 70 parts per billion standard that EPA ultimately finalized. NERA Report at 1. NERA’s non-peer-reviewed document also lacks credibility because its

cost estimates are the product of flawed and unscientific methodological choices. As a result, EPA properly found NERA's analysis to be meritless. *See Responses to Comments* at 353–54 (noting that NERA's analysis considered “impacts of standards stricter than the one EPA is adopting,” relied on a “proprietary model that is not transparent,” and “made unreasonable assumptions about control strategies available to states”).<sup>12</sup>

**A. The NERA Report Exaggerates the Cost of “Unidentified Controls”**

As the NERA Report acknowledges, the “primary difference in [its and EPA's] methodologies is the extrapolation method used to estimate the cost of ‘unknown’ controls,” which EPA refers to as “unidentified controls” in its final Regulatory Impact Analysis. NERA Report at 10; *see Ozone Regulatory Impact Analysis* at ES-7 n.6. NERA generated much higher cost estimates largely by assigning much higher costs to these controls, based on extrapolation from irrelevant data.

---

<sup>12</sup> EPA examined NERA's cost analysis only for the purpose of determining “whether there is a factual predicate for the commenter's assertion that a revised standard would lead to socio-economic disruption.” *See Responses to Comments* at 353.

To estimate the costs of a revised ozone standard, EPA first identified areas that would, under a business-as-usual scenario, have ozone concentrations above the new standard (that is, areas likely to be designated “nonattainment”). *See* Ozone Regulatory Impact Analysis at ES-5 to ES-8, figs.ES-1 & ES-2. Next, the agency estimated the volume of reduction of two types of ozone precursors—nitrogen oxides (“NO<sub>x</sub>”) and volatile organic compounds—that would be necessary to bring these areas into attainment. *See id.* at ES-6 to ES-7. Third, EPA estimated the portion of needed reductions that could be achieved through the use of “identified controls.” *See id.* at ES-7 to ES-9, tbls.ES-1 & ES-2. These identified controls (and the cost of implementing them) were drawn from EPA’s Control Strategy Tool database, which includes primarily “end-of-pipe” solutions, such as the use of selective catalytic reduction systems at electric generating units. *Id.* at ES-6 to ES-7, 3-10 tbl.3-1. Any remaining reductions were deemed to be achieved using “unidentified controls.” *Id.* at ES-9.

Petitioners characterize unidentified controls as those “which have yet to be developed,” Industry Pet’rs Br. 17, but EPA’s Regulatory Impact Analysis quite explicitly rebuts the notion that “all unidentified

control measures are currently not commercially available or do not exist,” Ozone Regulatory Impact Analysis at ES-9. Instead, unidentified controls are unidentified only in the sense that they are not included in EPA’s Control Strategy Tool database. The database, for instance, does “not include abatement possibilities from energy efficiency measures, fuel switching, input or process changes, or other abatement strategies that . . . [do not involve] the application of an end-of-pipe control.” *Id.* at ES-10.

EPA estimated that unidentified control measures would cost an average of \$15,000 per ton of NO<sub>x</sub> reduced. *Id.* at 4-7.<sup>13</sup> The agency noted that \$15,000 was well above the median control cost (\$10,400/ton) and emissions-weighted average cost (\$3,000/ton) of the 120,000 control opportunities that *were* in its database. *Id.* at 4-8 (noting average and median cost of identified controls); *see also id.* at 4-6 n.57 (noting number of observations in database). Indeed, 97 percent of the emissions reductions in the database were available at a cost of less than \$15,000/ton. *Id.* at 4-8.

---

<sup>13</sup> EPA’s analysis assumes that no unidentified control measures will be used for emissions of volatile organic compounds. Ozone Regulatory Impact Analysis at 4-7 n.58.

EPA also explored alternative approaches to estimating the costs of unidentified control measures, such as examining the average annualized costs of NO<sub>x</sub> offsets in four regions. *Id.* at 4-31 to 4-32. In some nonattainment areas, new sources (or existing sources looking to expand) are required to offset any increase they will cause in local emissions, typically by purchasing emission reduction credits from others in the area. *Id.* EPA explained that, because offsets can be generated through reduction strategies other than the end-of-pipe technologies included in the agency's Control Strategy Tool database, offset prices might "serve as reasonable proxies for the costs associated with emissions reductions from unidentified measures or controls." *Id.* at 4-34. The agency found that average annualized offset prices ranged from \$1,000 in the New York area to \$10,000 on California's South Coast, *id.* at 4-34 tbl.4-8, bolstering EPA's conclusion that assuming a \$15,000 average cost was "both appropriate and conservative." *See id.* at 4-8.<sup>14</sup>

---

<sup>14</sup> In an appendix, EPA explored additional approaches for estimating the cost of unidentified control measures, all of which generated estimates below \$15,000/ton. *See generally* Ozone Regulatory Impact Analysis, Appendix 4A.

Finally, EPA “explore[d] how sensitive total costs [were] to [the \$15,000/ton] assumption” by re-running its analysis using two alternative assumptions of average cost for unidentified control measures: \$10,000/ton and \$20,000/ton. *Id.* at 4-38 to 4-39. Twenty-thousand dollars per ton was, EPA noted, the highest price paid for any offset in the regional markets it surveyed. *Id.* at 4-39 to 4-40. Notably, even using this higher estimate, the benefits of a 70 parts per billion standard would still exceed the costs.<sup>15</sup>

Even though EPA’s methodology for estimating the costs of unidentified controls—assuming a constant average cost and acknowledging uncertainty through sensitivity analysis—was recommended by a 2007 Science Advisory Board peer review process, Ozone Regulatory Impact Analysis at 4-36, the NERA Report dismisses it as arbitrary and purports to take a “more evidence-based approach.”

---

<sup>15</sup> EPA found that unidentified control costs would be \$220 million higher for California and \$230 million higher for the rest of the United States under an assumed average cost of \$20,000/ton. *See id.* at 4-40 tbl.4-9, 4-41 tbl.4-10. As discussed earlier, under its primary \$15,000/ton assumption, the midpoint of EPA’s projected net benefits was \$0.85 billion in California and \$3 billion in the remainder of the country. *See supra* p. 10. Thus, under a \$20,000/ton assumption, a 70 parts per billion standard would still generate net benefits of \$0.63 billion in California and \$2.77 billion in the rest of the country.

NERA Report at 3, 10. As others have pointed out, however, the only “evidence” underlying NERA’s estimates is a single study on a single federal program: the Car Allowance Rebate System, more commonly known as “Cash for Clunkers.” Jeremy Fisher et al., Synapse Energy Economics, *Clearing Up the Smog: Debunking Industry Claims that We Can’t Afford Healthy Air* 18 (2015) [hereinafter “Synapse Report”].<sup>16</sup>

Administered by the National Highway Transportation Safety Administration in the summer of 2009, Cash for Clunkers enabled consumers to exchange older, less fuel-efficient vehicles for a \$3,500 to \$4,500 voucher to put toward the purchase of a newer, more fuel-efficient vehicle. Ted Gayer & Emily Parks, Economic Studies at Brookings, *Cash for Clunkers: An Evaluation of the Car Allowance Rebate System* 1–2 (2013) [hereinafter “Brookings Report”].<sup>17</sup> Borrowing the methodology of a study that examined Cash for Clunkers’ effect on carbon dioxide emissions, NERA estimated that a similar program

---

<sup>16</sup> Available at

<http://earthjustice.org/sites/default/files/files/Clearing%20Up%20the%20Smog%20-%2009-10-15%20FINAL%20VERSION.pdf>.

<sup>17</sup> Available at

[http://www.brookings.edu/~media/research/files/papers/2013/10/cash-for-clunkers-evaluation-gayer/cash\\_for\\_clunkers\\_evaluation\\_paper\\_gayer.pdf](http://www.brookings.edu/~media/research/files/papers/2013/10/cash-for-clunkers-evaluation-gayer/cash_for_clunkers_evaluation_paper_gayer.pdf).

implemented in 2020 would expend about \$500,000 for each ton of NO<sub>x</sub> it reduced. NERA Economic Consulting, *Assessing Economic Impacts of a Stricter National Ambient Air Quality Standard for Ozone*, Appendix C, at C-10 to C-11 (2014).<sup>18</sup> (To arrive at this figure, NERA had to make a series of assumptions about the age of the vehicles that would be scrapped under the program, the size of rebate necessary to induce scrapping, the number of additional years and miles the vehicles would have been driven if not scrapped, and the NO<sub>x</sub> emission rates of both the scrapped vehicles and their replacements. *Id.*<sup>19</sup>) NERA then used this \$500,000/ton figure to extrapolate the marginal cost of all other unidentified controls. *Id.* at C-11.

The problem with using the Cash for Clunkers program as a proxy for the marginal cost of NO<sub>x</sub> abatement is that the Cash for Clunkers

---

<sup>18</sup>Available at <http://www.nam.org/Issues/Energy-and-Environment/Ozone-Regulations/NERA-NAM-Ozone-Full-Report-20140726>. This July 2014 report analyzed the impacts of a different potential standard (60 parts per billion), but NERA used the same methodology for estimating the cost of unidentified control measures in the February 2015 report cited by Petitioners. *See* NERA Report at 2–4.

<sup>19</sup> Changing any of these assumptions would yield dramatically different cost estimates. For instance, NERA assumes that its hypothetical Cash for Clunkers-like program would accelerate vehicle retirements by four years. Synapse Report at 21. If it instead assumed a six-year acceleration, the estimate per ton cost of the program would drop by 30 percent. *Id.*

program was not designed to reduce NO<sub>x</sub> pollution. Instead, its primary goals were to stimulate the recession-afflicted U.S. economy and to improve the fuel efficiency of the nation's vehicle fleet. Brookings Report at 1. NO<sub>x</sub> reductions were merely an indirect benefit of the program, because newer cars are subject to tighter emission standards and thus emit NO<sub>x</sub> at lower rates. There is absolutely no reason whatsoever to believe that the "unidentified" control strategies will be as costly on a per ton basis as Cash for Clunkers. *See Responses to Comments* at 354 (noting that, while "[t]here are many options available to states to reach attainment with the standards," NERA "appear[ed] to have chosen some of the least cost-effective measures possible" for its analysis). The starting place for the NERA Report's cost estimate is a wild misapplication of data from one domain (Cash for Clunkers) to another (ozone control strategies) without any basis in fact or logic.

Furthermore, it is not even clear that the Cash for Clunkers program was itself as costly as the NERA analysis assumes. As discussed above, NERA derived its NO<sub>x</sub> reduction-cost estimate from a 2009 study, which pegged the implied cost of carbon dioxide reductions

under Cash for Clunkers at \$400/ton. Synapse Report at 21. But a 2012 study of Cash for Clunkers generated a significantly lower estimate of between \$105 and \$281 per ton of carbon dioxide. *Id.* Thus, NERA not only based its estimates of the cost of pollution reduction on a completely inappropriate extrapolation from a program that was not, in fact, designed to reduce pollution, it also cherry-picked a study that made that program look as costly as possible.

**B. NERA's Estimates of Job Losses and Other Market Impacts Are Speculative and Contaminated by Its Unfounded Cost Estimates**

On the basis of its grossly unfounded cost estimates for unidentified controls, NERA concluded that total compliance costs under a 65 parts per billion standard would be several times higher than EPA's projections. NERA Report at 9. NERA then purported to model how those compliance costs would ripple through the broader economy, predicting reductions in GDP, lost "job-equivalents," and declines in average annual household consumption. *Id.* at 11–12.<sup>20</sup> But,

---

<sup>20</sup> NERA could not directly estimate job impacts, because its model "is based on the assumption of full employment." Responses to Comments at 354. Instead, NERA "estimat[ed] changes in overall labor income and divid[ed] this by the average wage to estimate losses of so-called 'job equivalents'." *Id.* As NERA itself acknowledged, however, it would be

as with its cost estimates for unidentified controls, NERA's numbers for market and employment impacts do not withstand scrutiny.

NERA used a proprietary "integrated energy-economic macroeconomic model," also known as a Computable General Equilibrium model, to generate its estimates of market and employment impacts. NERA Report at 1. As EPA explained in its Regulatory Impact Analysis, Computable General Equilibrium models are "one possible tool for evaluating the impacts of a regulation on the broader economy," but they also present "serious technical challenges." Ozone Regulatory Impact Analysis at 4-42 to 4-43. For instance, while the models attempt to predict behavioral responses to the *costs* of a regulation and how those responses will impact the broader economy, most do not consider behavioral responses that are likely to result from the regulation's *benefits*. *Id.* As a result, they may produce biased results. *Id.*; see also EPA, *Economy-Wide Modeling: Social Cost and Welfare White Paper*, Prepared for the U.S. EPA Science Advisory Board Panel on Economy-Wide Modeling of the Benefits and Costs of Environmental Regulation

---

misleading to characterize this calculation as "a projection of numbers of workers that may need to change jobs and/or be unemployed," because "some or all of the [predicted income reductions] could be spread across workers who remain employed." NERA Report at 1 n.2.

64 (2015) (noting that there “are many parameters and design features of [Computable General Equilibrium] models that may have sizeable effects on social cost estimates” and that “the literature contains little guidance on how to address technical issues and challenges encountered” when using such models to assess the effects of air regulations).<sup>21</sup>

EPA recently established a new Science Advisory Board panel “to consider the technical merits and challenges of using [Computable General Equilibrium models] and other economy-wide modeling tools to evaluate costs, benefits, and economic impacts of air regulations.” Ozone Regulatory Impact Analysis at 4-43. The agency plans to use this panel’s recommendations “as an input into its process for improving benefit-cost and economic impact analyses.” *Id.* In the meantime, EPA chose to include a qualitative rather than quantitative analysis of market and employment impacts in the Regulatory Impact Assessment for the revised ozone NAAQS. *Id.* at 4-44. As part of that qualitative discussion, the agency noted that, given the information available, it

---

<sup>21</sup> *Available at*

[https://yosemite.epa.gov/sab/sabproduct.nsf/LookupWebProjectsCurrentBOARD/07E67CF77B54734285257BB0004F87ED/\\$File/Social+Cost+and+Welfare+White+Paper+9-22-15.pdf](https://yosemite.epa.gov/sab/sabproduct.nsf/LookupWebProjectsCurrentBOARD/07E67CF77B54734285257BB0004F87ED/$File/Social+Cost+and+Welfare+White+Paper+9-22-15.pdf).

was not possible to “conclude the direction of price and quantity changes for any single market” or to reach any broader estimates of “changes in international trade, profits, closures, or social cost.” *Id.*

As the government has emphasized in its own brief, EPA is not only not required to consider regulatory costs when setting a NAAQS, but is, in fact, *forbidden* from compromising its standards on that basis. EPA Br. at 120. But even if the law were different and EPA did need to consider costs in some fashion, the agency would retain substantial discretion as to *how* to consider them. *See Michigan v. EPA*, 135 S. Ct. 2699, 2711 (2015) (finding that EPA “must consider cost . . . before deciding whether regulation is appropriate and necessary” under 42 U.S.C. § 112(n)(1) but noting that it would still “be up to the agency to decide (as always, within the limits of reasonable interpretation) how to account for cost”); *see also* 135 S. Ct. at 2726 (Kagan, J., dissenting) (“[W]hen Congress does not say how to take costs into account, agencies have broad discretion to make that judgment. . . . Far more than courts, agencies have the expertise and experience necessary to design regulatory processes suited to ‘a technical and complex arena.’” (quoting *Chevron v. Natural Res. Def. Council*, 467 U.S. 834, 863 (1984))). Even

where economic tools to estimate the costs and benefits of agency actions are far more well-established than Computable General Equilibrium models, courts have been found them sufficiently close to the “frontiers of scientific knowledge” that agencies are not *obligated* to use them. *Ctr. for Sustainable Econ. v. Jewell*, 779 F.3d 588, 612 (D.C. Cir. 2015) (quoting *California v. Watt*, 712 F.2d 584, 600 (D.C. Cir. 1983) (holding, in a challenge to the Department of Interior’s five-year leasing plan for offshore mineral resources, that an agency need not quantitatively estimate the information value of delay because tools to do so were not yet sufficiently “well established” that the failure to use them would be arbitrary or capricious).

Instead, the agency’s decision to monetize costs that it deems reasonably susceptible to quantification and to qualitatively discuss those that are not—an approach consistent both with its internal guidelines on cost-benefit analysis and with White House guidance dating to the George W. Bush administration—would be entitled to deference from the court. *See EPA, Guidelines for Preparing Economic Analyses* 7-49 (2014) (“When there are potentially important effects that cannot be quantified, the analyst should include a qualitative

discussion of benefits results.”); Office of Mgmt. & Budget, *Circular A-4* at 2 (2003) (noting that some costs “may be inherently too difficult to quantify or monetize given current data and methods”).

### **III. RECENT EMPIRICAL STUDIES CONTRADICT PETITIONERS’ CLAIM THAT REGULATORY COSTS NEGATIVELY AFFECT PUBLIC HEALTH**

In *Whitman*, the Supreme Court found that Section 109(b) of the Clean Air Act “unambiguously bars cost considerations from the NAAQS-setting process.” 531 U.S. at 471. While Industry Petitioners try to get around this holding by rebranding costs as “adverse impacts,” State Petitioners seek to skirt it by reframing costs as health risks. They argue that Section 109(b)’s health-focused mandate<sup>22</sup> leaves room for consideration of regulatory costs, because “costs imposed on industry and the States . . . influence the ‘standard of living’ in the community,” which, in turn, affects public health. State Pet’rs Br. 48–49. Petitioners seek support for this reading of the Act in Justice Breyer’s *Whitman* concurrence, which noted that efforts to protect public health need not “lead to deindustrialization” because “[p]reindustrial society was not a very healthy society.” *Whitman*, 531 U.S. at 496 (Breyer, J., concurring).

---

<sup>22</sup> NAAQS must be set at a level “requisite to protect the public health” with “an adequate margin for safety.” 42 U.S.C. § 7409(b).

The majority opinion in *Whitman*, however, expressly considered and rejected the idea that EPA could shoehorn costs into its NAAQS-setting process by reinterpreting them as health risks. The parties challenging EPA's standard in that case argued that "many more factors than air pollution affect public health" and that "the economic cost of implementing a very stringent standard might produce health losses sufficient to offset the health gains achieved in cleaning the air." *Id.* at 466 (majority opinion). The Court accepted this assertion as "unquestionably true," but concluded that the cost of implementation was "*both* so indirectly related to public health *and* so full of potential for canceling the conclusions drawn from direct health effects that it would surely have been expressly mentioned in [the NAAQS-related sections of the Clean Air Act] had Congress meant it to be considered." *Id.* at 466, 469.

While Justice Breyer did not join this portion of the majority's opinion, *see id.* at 490 (Breyer, J., concurring), he seemed to contemplate that EPA would have discretion to consider cost-related effects on public health only when necessary to avoid "extreme" economic impacts, like "deindustrialization." *See id.* at 495–96.

Petitioners do not and cannot reasonably contend that the new ozone standard heralds the “return of the Stone Age” to which Justice Breyer alluded in his concurrence. *Id.* at 496.

Furthermore, in the years since *Whitman* was decided, multiple peer-reviewed studies have revealed that, contrary to the Court’s assumption in 2001, it is *not* “unquestionably true” that regulatory costs can, by reducing wealth, negatively affect health. Thus, even if EPA *were* permitted to consider cost-related health effects when setting NAAQS, it is not clear that it would find evidence of any such effects. much less that they would be substantial enough to outweigh the tremendous positive health effects associated with a 70 parts per billion ozone standard.

Wealth and health are undoubtedly *correlated*. The wealthy do, on average, enjoy longer lives. See Richard L. Revesz & Michael A. Livermore, *Retaking Rationality: How Cost-Benefit Analysis Can Better Protect the Environment and Our Health* 67 (2008). But the causal relationships behind that simple correlation are extremely complex and remain a subject of ongoing research within the economic and public health communities.

For example, some studies suggest that the causal effect runs in the opposite direction—that is, that health affects wealth—both because those in poor health have higher medical expenditures and because they are less able to work. *See, e.g.*, James M. Poterba, Steven F. Venti & David A. Wise, *The Asset Cost of Poor Health* 26–27 (Nat’l Bureau of Econ. Research, Working Paper No. 16,389, 2010) (finding that the “asset cost of poor health may be quite large”).<sup>23</sup> Others have found that much of the correlation between health and wealth can be explained by a third factor: education. Increased schooling, in other words, seemed to lead both to higher earnings and better health. *See, e.g.*, James P. Smith, *The Impact of Socioeconomic Status on Health over the Life-Course*, 42 *J. of Hum. Res.* 739, 739 (2007) (noting that, while socioeconomic status affects future health outcomes “the primary influence is education and not an individual’s financial resources in whatever form they are received”); Raj Chetty et al., *The Association Between Income and Life Expectancy in the United States, 2001–2014*, 315 *J. of the Am. Med. Ass’n* 1750, 1759, 1764 (2016) (finding that the poor live longer in cities where a higher percentage of the population

---

<sup>23</sup> Available at <http://www.nber.org/papers/w16389.pdf>.

are college graduates). Ultimately, as the authors of a 2010 literature review observed, “there is much that we still do not know about the links between income, education, and health.” Ichiro Kawachi et al., *Money, Schooling, and Health: Mechanisms and Causal Evidence*, 1186 *Annals of the N.Y. Acad. of Sci.* 56, 65 (2010).

Even if there were a causal relationship between wealth and health, the effect would likely depend on additional factors, like age, income level, and access to subsidized health insurance. See Michael A. Livermore & Richard L. Revesz, *Rethinking Health-Based Environmental Standards*, 89 *N.Y.U. L. Rev.* 1184, 1230 (2014). Thus, any health effects resulting from the costs of a regulation would be “tightly linked to the distribution of [those] costs.” *Id.* (explaining that “regulations with costs that fall mostly on high-income individuals [would] have few health-wealth effects, [while] rules that financially benefit the poor, for example by creating employment opportunities for low-skill workers, would result in increased health”).

Petitioners have presented no evidence that the costs of the revised ozone NAAQS will be distributed in such a way as to cause a negative effect on public health, and EPA is certainly not required to

undertake this “extraordinarily complex analytic task,” especially given the likelihood that any such effects would be dwarfed by the direct health benefits of an ozone standard. *Id.*; *see also supra* pp. 23–25 (discussing EPA’s discretion as to *how* costs are considered).

In summary, Petitioners’ argument that EPA was obligated to consider alleged negative health effects caused by regulatory costs is neither consistent with the Supreme Court’s decision in *Whitman* nor supported by empirical literature. EPA cannot be expected to consider a health risk that it has no reason to believe exists.

### CONCLUSION

The petitions for review should be denied.

Respectfully submitted,

/s/ Richard L. Revesz

Richard L. Revesz

Denise A. Grab

Jack Lienke

Michael A. Livermore

Jason A. Schwartz

INSTITUTE FOR POLICY INTEGRITY

139 MacDougal Street, Room 319

New York, NY 10012

(212) 992-8932

richard.revesz@nyu.edu

*Counsel for Amicus Curiae*

*Institute for Policy Integrity*

DATED: August 4, 2016

**CERTIFICATE OF COMPLIANCE WITH WORD LIMITATION**

Counsel hereby certifies that, in accordance with Federal Rule of Appellate Procedure 32(a)(7)(C), the foregoing Brief of the Institute for Policy Integrity at New York University School of Law as Amicus Curiae In Support of Respondent contains 5647 words, as counted by counsel's word processing system, and this complies with the applicable word limit established by the Court.

DATED: August 4, 2016

/s/ Richard L. Revesz

Richard L. Revesz

Denise A. Grab

Michael A. Livermore

Jack Lienke

Jason A. Schwartz

INSTITUTE FOR POLICY INTEGRITY

139 MacDougal Street, Room 319

New York, NY 10012

(212) 992-8932

richard.revesz@nyu.edu

*Counsel for Amicus Curiae*

*Institute for Policy Integrity*

**CERTIFICATE OF SERVICE**

I hereby certify that on August 4, 2016, I filed the foregoing Corrected Final Brief of the Institute for Policy Integrity at New York University School of Law as Amicus Curiae in Support of Respondent and accompanying Addendum of the Institute for Policy Integrity as Amicus Curiae in Support of Respondent through the Court's CM/ECF system, which will send a notice of filing to all registered CM/ECF users. All participants in the case are registered CM/ECF users.

DATED: August 4, 2016

/s/ Richard L. Revesz  
Richard L. Revesz  
*Counsel for Amicus Curiae*  
*Institute for Policy Integrity*