

ORAL ARGUMENT SCHEDULED FOR MAY 18, 2017

No. 16-1127 (and consolidated cases)

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

MURRAY ENERGY CORPORATION, et al.,

Petitioners,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,

Respondent.

ON PETITIONS FOR REVIEW OF A FINAL RULE OF THE UNITED
STATES ENVIRONMENTAL PROTECTION AGENCY

FINAL BRIEF OF RESPONDENT

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CERTIFICATE AS TO PARTIES, RULINGS AND RELATED CASES

Pursuant to Circuit Rule 28(a)(1), Respondent United States Environmental Protection Agency (“EPA”) provides the following information.

A. Parties, Intervenors and Amici

All parties, intervenors and amici are listed in the Petitioners’ Opening Brief filed November 18, 2016, EPA’s Brief filed January 18, 2017, and the Brief of Non-Governmental Organization Intervenors filed March 21, 2017.

B. Rulings Under Review

Petitioners challenge a final rule entitled, “*Supplemental Finding That It Is Appropriate and Necessary to Regulate Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units.*” 81 Fed. Reg. 24,420 (Apr. 25, 2016).

C. Related Cases

White Stallion Energy Center, LLC v. EPA, 748 F.3d 1222 (D.C. Cir. 2014), *rev’d Michigan v. EPA*, 135 S. Ct. 2699 (2015).

This Court has ordered that this case be scheduled for argument on the same day and before the same panel as *ARIPPA v. EPA*, No. 15-1180. *See* ECF No. 163520.

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GLOSSARY

CAA	Clean Air Act, 42 U.S.C. §§ 7401-7671q
EPA	United States Environmental Protection Agency
HCl	Hydrogen Chloride
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standards
OMB	Office of Management and Budget
PM	Particulate Matter
RIA	Regulatory Impact Analysis
RTC	Response to Comments
Standards	Mercury and Air Toxics Standards, 77 Fed. Reg. 9304 (Feb. 16, 2012).
SO ₂	Sulfur Dioxide
Supplemental Finding	Supplemental Finding That It Is Appropriate and Necessary To Regulate Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units, 81 Fed. Reg. 24,420 (Apr. 25, 2016).

JURISDICTIONAL STATEMENT

EPA agrees with Petitioners' Jurisdictional Statement.

STATUTES AND REGULATIONS

Except for 42 U.S.C. §§ 7401 and 7503, which appear in an addendum to this brief, all applicable statutes and regulations are contained in Petitioners' Addendum.

INTRODUCTION

In *Michigan v. EPA*, 135 S. Ct. 2699 (2015), the Supreme Court held that EPA must consider cost when determining whether it is appropriate and necessary to regulate hazardous air pollutant emissions from power plants under Clean Air Act (“CAA”) section 112(n)(1)(A), 42 U.S.C. § 7412(n)(1)(A). *Michigan*, 135 S. Ct. at 2712. Yet the Supreme Court did not mandate a particular method of considering cost, instead concluding that “[i]t will be up to the Agency to decide (as always, within the limits of reasonable interpretation) how to account for cost.” *Id.* at 2711.

In the action at issue here, EPA found, after reasonably interpreting the statute and thoroughly considering cost, that it remains appropriate and necessary to regulate hazardous air pollutant emissions from power plants under CAA section 112, thereby fully addressing the Supreme Court's decision in *Michigan*. Specifically, EPA determined under two independent approaches to considering cost that regulation of such emissions under section 112 is appropriate. Under EPA's preferred approach, the EPA Administrator considered several cost factors, including the cost of the Mercury and Air Toxics Standards (“Standards”) as a percentage of the power sector's

historical revenue, expenditures, and rate changes, and also the ability of the power sector to comply with the cost of the Standards while continuing to provide a reliable source of electricity. EPA then weighed those cost factors qualitatively with the public health and environmental hazards of power plants' hazardous air pollutant emissions. Under EPA's benefit-cost approach, which utilized widely-accepted economic principles, EPA found that the monetized benefits of the Standards outweigh the costs by tens of billions of dollars. In challenging EPA's conclusions, Petitioners raise the following issues:

STATEMENT OF ISSUES

1. Does EPA's preferred approach to considering cost for purposes of making the "appropriate and necessary" finding under CAA section 112(n)(1)(A), 42 U.S.C. § 7412(n)(1)(A), which considered three separate cost metrics and additional cost factors and then weighed those with the public health and environmental hazards addressed by the Standards, reasonably satisfy the broad language of the statute and the Supreme Court's remand in *Michigan v. EPA*, 135 S. Ct. 2699 (2015)?

2. If not, does EPA's independent benefit-cost approach, which quantified to the extent possible the benefits that will flow from the Standards and compared those monetized benefits to the costs of the Standards, reasonably satisfy EPA's obligation to consider cost?

3. Was EPA required to consider proposed regulatory alternatives to CAA section 112 regulation, and in any event, did EPA reasonably reject those proposed alternatives?

4. Did EPA reasonably consider non-speculative costs raised in comments?

STATEMENT OF FACTS

I. STATUTORY BACKGROUND

The CAA was enacted in 1970 and extensively amended in 1977 and 1990 to “protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare.” 42 U.S.C. § 7401(b)(1). Frustrated by EPA’s slow progress in regulating hazardous air pollutants under the original CAA section 112, 42 U.S.C § 7412, Congress substantially amended that section in 1990 to ensure that EPA would require prompt, permanent, and ongoing regulation of those pollutants. *See White Stallion Energy Center v. EPA*, 748 F.3d 1222, 1230 (D.C. Cir. 2014), *rev’d Michigan v. EPA*, 135 S. Ct. 2699 (2015); Legal Memorandum Accompanying the Proposed Supplemental Finding (“Legal Memorandum”) 6 [EPA-OAR-2009-0234-20519], JA0024. These amendments included an identification of 189 hazardous air pollutants, known for their toxic qualities often at very low doses, and a requirement that EPA identify, list, and regulate all “major sources” of those pollutants no later than ten years after the amendments. *White Stallion*, 748 F.3d at 1230; 42 U.S.C. § 7412(b), (c)(1)-(2), (d). The amendments further required that EPA identify, list, and regulate smaller “area sources” of hazardous air pollutants when the

Administrator finds a threat of adverse health or environmental effects, or to the extent necessary to ensure that sources accounting for 90 percent of the aggregate area source emissions of certain key pollutants are regulated. *See* 42 U.S.C.

§ 7412(c)(3).

EPA promulgates hazardous pollutant emission standards under CAA section 112(d) for new and existing listed sources. *See* 42 U.S.C. § 7412(d). The amended statute generally requires that the standards be set at a level equal to the Maximum Achievable Control Technology (“MACT”) and explicitly provides that MACT standards must be no less stringent than the average emission limitation achieved by the best performing sources (the “floor”). The statute also requires EPA to determine whether more stringent “beyond-the-floor” MACT standards are achievable. *See White Stallion*, 748 F.3d at 1230; *see also* 42 U.S.C. § 7412(d)(3)(A)-(B).

CAA section 112(f) instructs EPA to evaluate risks to public health remaining after imposition of standards promulgated under section 112(d) and determine whether additional standards are needed “to provide an ample margin of safety to protect public health” or “to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect.” *Id.* § 7412(f)(1)-(2). Under CAA section 112(d)(6), EPA is also required to revisit the standards every eight years and “revise as necessary (taking into account developments in practices, processes, and control technologies)” 42 U.S.C. § 7412(d)(6).

CAA section 112(n)(1) contains specific requirements for the listing of electric utility steam generating units (“power plants”). *See id.* § 7412(n)(1). In section 112(n)(1)(A), Congress directed EPA to conduct a study of the hazards to public health, if any, resulting from emissions of hazardous air pollutants from power plants that would reasonably be anticipated to occur following implementation of the requirements of the Act (the “Utility Study”), and to report the results of such study to Congress by November 15, 1993. *Id.* § 7412(n)(1)(A). Congress recognized that power plants would be uniquely affected by title IV of the CAA, which includes the Acid Rain Program also added by the 1990 amendments. *See* Legal Memorandum 12. Congress expected that the Acid Rain Program would reduce acid-rain-forming pollutants through the installation of control technology called “scrubbers,” which were also expected to reduce hazardous air pollutant emissions from power plants. *See id.* Congress required EPA to regulate power plants under section 112 if the Administrator determined that such regulation is “appropriate and necessary,” after considering the Utility Study. 42 U.S.C. § 7412(n)(1)(A).

Additionally, Congress required that two other studies be conducted: (1) a study by EPA of mercury emissions from power plants and other sources, including the “rate and mass” and “health and environmental effects” of such emissions, available control technologies, and the costs of such technologies, *id.* at § 7412(n)(1)(B) (the “Mercury Study”); and (2) a study by the National Institute of Environmental Health Sciences “to determine the threshold level of mercury

exposure below which adverse human health effects are not expected to occur[.]” including “a threshold for mercury concentrations in the tissue of fish which may be consumed (including consumption by sensitive populations) without adverse effects to public health.” *Id.* § 7412(n)(1)(C). In addition, in 1998, the National Academy of Sciences was tasked with advising EPA on the development of a reference dose for methylmercury—*i.e.*, an estimate of daily exposure experienced over a lifetime that is likely to be without risk of adverse health effects to humans, including sensitive subpopulations. *See* Legal Memorandum 14, JA0032. A House conference report directed EPA to fund the study, and indicated that EPA should not make the appropriate and necessary determination under CAA section 112(n)(1)(A) until EPA had reviewed the results of that study. *See* Legal Memorandum 14 (citing H.R. Conf. Rep. No. 105-769 at 281-82 (1998), JA1936-37).

II. REGULATORY AND LITIGATION HISTORY

Consistent with the 1990 CAA amendments, EPA conducted a detailed study of the public health hazards from power plants’ hazardous air pollutant emissions and the hazards to human health and the environment from mercury emissions from all sources. Based primarily on the CAA section 112(n)(1) studies, EPA made a finding in 2000 that regulation of coal- and oil-fired power plants is appropriate and necessary and added such sources to the section 112(c) list of sources that must be regulated under section 112(d). *See* 65 Fed. Reg. 79,825, 79,826 (Dec. 20, 2000) (the “2000

finding”).¹ EPA then reaffirmed that finding based on additional analyses when it promulgated final emission standards for power plants in the Standards in 2012. *See* 77 Fed. Reg. 9304, 9310-11 (Feb. 16, 2012); *see also* 76 Fed. Reg. 24,976, 25,015-18 (May 3, 2011) (proposed rule for the Standards).²

Among other things, EPA found that power plants are by far the largest anthropogenic source of mercury emissions in the United States, responsible for approximately 50 percent of all such emissions. 76 Fed. Reg. at 25,002, Table 3. Power plants are also the largest source of acid gas hazardous air pollutants, emitting 82 percent of anthropogenic domestic hydrogen chloride (“HCl”) emissions and 62 percent of hydrogen fluoride emissions. *Id.* at 25,005, Table 4. Additionally, power plants are a significant source of many hazardous metals, including selenium (83%), arsenic (62%), nickel (28%), and chromium (22%). 76 Fed. Reg. at 25,006, Table 5.

¹ In 2005, EPA revised the 2000 appropriate and necessary finding and promulgated the Clean Air Mercury Rule, but these actions were vacated by this Court, *see New Jersey v. EPA*, 517 F.3d 574, 578 (D.C. Cir. 2008), and later rejected by the Agency as flawed and not justified. *See* 76 Fed. Reg. at 25,019-20.

² Once EPA listed power plants as a source category to be regulated under CAA section 112 in 2000, EPA had a nondiscretionary duty to promulgate emission standards for this source category within two years. 42 U.S.C. § 7412(c)(5). Thus, the emission standards ultimately promulgated in February 2012 were almost ten years overdue. In those ten years, power plants emitted significant levels of hazardous air pollutants, including many hundreds of tons of mercury that remains in the environment. *See* Proposed Rule, 80 Fed. Reg. at 75,038, n.45; 76 Fed. Reg. at 25,015.

Peer-reviewed studies in the record show that such emissions pose and will continue to pose a hazard to public health and the environment notwithstanding implementation of the other provisions of the CAA. For example, mercury, the pollutant of greatest concern,³ is emitted from power plants, deposits into waterbodies, and then bioaccumulates in fish in the highly toxic form of methylmercury. *See id.* at 25,000. When people consume these fish, they consume methylmercury, which may cause adverse neurotoxic effects (*i.e.*, damage to the brain and nervous system). Methylmercury exposure is a particular concern for children and fetuses because their developing bodies are more highly sensitive to its effects. *See id.* at 24,977-78. Additionally, methylmercury exposure may be much higher than average for specific groups of people, including subsistence fishers, Asian-Americans, and members of some Native American Tribes. *Id.*

Non-mercury hazardous air pollutants emitted by power plants are associated with chronic health disorders (e.g., irritation of the lung, skin, and mucus membranes, nervous system effects, and kidney damage) and acute health disorders (e.g., lung irritation and congestion, nausea and vomiting, and liver, kidney and nervous system effects). *See* 76 Fed. Reg. at 24,978. Acid gas hazardous air pollutants emitted by power plants also add to environmental degradation due to acidification. *See* 76 Fed. Reg. at 25,016; *see also* 77 Fed. Reg. at 9362.

³ *See* 76 Fed. Reg. at 24,994; *see also* 42 U.S.C. § 7412(n)(1)(B), (C) (reflecting Congress's particular concern with mercury emissions from power plants).

In the Standards, EPA promulgated technology-based emission standards under CAA section 112(d) for hazardous air pollutants emitted by power plants. *See* 77 Fed. Reg. at 9367-69. With almost no exceptions, EPA declined to exercise its discretion to make these standards more stringent than the “floor”—*i.e.*, the least stringent level allowed by Congress. *See* 77 Fed. Reg. at 9367 (Table 3), 9369. Sources were required to comply with the Standards by April 16, 2015, but some units obtained one-year extensions to April 2016, and a small number of plants obtained limited extensions beyond April 2016 where necessary for reliability of the electricity grid. Thus, all but a handful of affected units are now required to be in full compliance with the Standards. EPA estimated that the Standards would reduce annual emissions of mercury by 75 percent, hydrogen chloride by 88 percent, and fine particulate matter (“PM”) (a surrogate for non-mercury metallic hazardous air pollutants) by 19 percent from large coal-fired power plants. *See* 80 Fed. Reg. at 75,033.

When reaffirming the 2000 finding in the Standards, EPA concluded that CAA section 112(n)(1)(A) did not require EPA to consider cost in making an appropriate and necessary finding. *See* 77 Fed. Reg. at 9324-27. Notwithstanding EPA’s conclusion, pursuant to Executive Order, EPA estimated the costs and quantifiable benefits of the Standards in a Regulatory Impact Analysis (“RIA”) during the rulemaking process for the Standards. *See* Regulatory Impact Analysis for Final Mercury and Air Toxics Standards [EPA-HQ-OAR-2009-0234-20131], JA0393. EPA

projected in the RIA that in 2016, the total monetized benefits of the promulgated standards would be \$33 to \$90 billion, the total cost (which includes the cost of installing and operating controls and other compliance measures as well as monitoring, recordkeeping, and reporting costs) would be \$9.6 billion, and the quantifiable net benefits would be \$24 to \$80 billion. *See* 77 Fed. Reg. at 9305-06. EPA also explained that it was unable to monetize all of the Standards' benefits and that unquantified benefits could be substantial. RIA at ES-10-ES-13, JA0420-0424. In the RIA, EPA stated that implementation of the Rule "is expected, based purely on economic efficiency criteria, to provide society with a significant net gain in social welfare, even given the limited set of health and environmental effects [the agency was] able to quantify." RIA at 8-1, JA0595. EPA therefore concluded that "it remains clear that the benefits" of the Standards "are substantial and far outweigh the costs." 77 Fed. Reg. at 9306.

On consolidated petitions for review before this Court, a number of petitioners challenged, among other things, EPA's interpretation of CAA section 112(n)(1)(A), arguing that the statute required EPA to consider cost when determining whether regulating power plants is appropriate and necessary. *See White Stallion*, 748 F.3d at 1236. This Court concluded that CAA section 112(n)(1)(A)'s terms were ambiguous and that "EPA reasonably concluded it need not consider costs" for the determination. *Id.* at 1237, 1241.

In *Michigan v. EPA*, however, the Supreme Court disagreed. The Supreme Court explained that “[r]ead naturally in the present context, the phrase ‘appropriate and necessary’ requires at least some attention to cost,” 135 S. Ct. 2699, 2707 (2015), and held that “EPA interpreted § 7412(n)(1)(A) unreasonably when it deemed cost irrelevant to the decision to regulate power plants.” *Id.* at 2712. The Supreme Court did not dictate a specific approach for considering cost and instead stated that “[i]t will be up to the Agency to decide (as always, within the limits of reasonable interpretation) how to account for cost.” *Id.* at 2711. The Supreme Court remanded the consolidated cases to this Court for further proceedings. *See id.* at 2712. After briefing and argument by the parties, this Court remanded the Standards to EPA without vacatur so that EPA could address the Supreme Court’s decision while the Standards remained in effect. *See* Case No. 12-1100, ECF No. 1588459.

III. THE SUPPLEMENTAL FINDING

In response to the Supreme Court’s decision, EPA commenced a new rulemaking to reevaluate its CAA section 112(n)(1)(A) appropriate and necessary finding. On December 1, 2015, EPA published a proposal that considered cost and proposed to find that regulation of hazardous air pollutant emissions from power plants remained appropriate and necessary. 80 Fed. Reg. 75,025, 75,027, 75,029-41 (Dec. 1, 2015) (“Proposed Rule”). At the same time, EPA issued a companion Legal Memorandum. Legal Memorandum, JA0019.

In the Proposed Rule, EPA proposed two independent approaches for considering cost for the appropriate and necessary finding. Under EPA's preferred approach, the Agency first evaluated three cost metrics and several additional cost factors to determine whether the cost of the Standards is reasonable. *See* Proposed Rule, 80 Fed. Reg. at 75,031-37. EPA then proposed to conclude that the cost of the Standards is reasonable and considered that proposed finding in conjunction with the Agency's prior findings regarding the hazards to public health and the environment posed by the significant quantity of power plants' hazardous air pollutant emissions. *See id.* at 75,036/3-75,038/3.

Specifically, for the first cost metric, EPA evaluated the annual compliance costs⁴ as a percentage of revenue from the power sector's annual retail electricity sales and found that the estimated \$9.6 billion annual cost of the Standards is a small fraction of the power sector's annual revenue, which ranged from \$277.2 billion to \$356.6 billion between 2000 and 2011. *See id.* at 75,033/2-3. For the second cost metric, EPA compared the annual capital expenditures related to the Standards with the power sector's annual capital expenditures between 2000 and 2011. *See id.* at 75,034. EPA explained that the cost to comply with the Standards represented only 3-5.3 percent of the power sector's capital expenditures in recent years, which the

⁴ EPA defined "annual compliance costs" as a projection of the increase in expenditures by power plant owners required as a result of the Standards. These expenditures include capital, fuel, and other variable and operating costs. The costs may be borne by power plant owners, or passed along to electricity consumers in the form of higher electricity prices. *See* 81 Fed. Reg. at 24,424.

Agency concluded was well within the range of annual variability during 2000-2011. *See id.* For the third cost metric, EPA considered the impact of compliance with the Standards on the retail price of electricity. *See id.* at 75,035. EPA explained that the projected impact on electricity rates was 0.3 cents per kilowatt hour or 3.1 percent, which EPA concluded was well within the range of price fluctuations in recent years. *See id.*

In addition to the three cost metrics, EPA determined that the Agency should also consider the ability of the power sector to comply with the Standards while still providing a reliable supply of electricity. *See id.* at 75,035/3-36. EPA proposed to find that the vast majority of the generation capacity affected by the Standards would be able to absorb the cost of compliance, and that reliability and resource adequacy would not be adversely affected. *See id.* at 74,036/1. Thus, EPA proposed to find that the cost of the Standards is reasonable. *See id.* at 75,036.

Additionally, because of its relationship to section 112(n)(1)(A) in the 1990 amendments, EPA also considered the cost of the Acid Rain Program, which turned out to be lower than expected, and new technology developments that reduce the cost of controlling mercury and non-mercury emissions since EPA estimated those costs in the Mercury Study in 1997, and other 1990 studies. *See id.* at 75,037.

EPA then weighed the reasonable cost of the Standards with a number of other factors that EPA deemed relevant under CAA section 112 including the volume of hazardous air pollutants emitted by power plants and the associated hazards to public

health and the environment. *See id.* at 75,038-39/2. EPA provided a summary of these factors in the Proposed Rule, but also incorporated by reference the Standards record. *See id.* at 75,038/3.

In particular, in the Proposed Rule, EPA explained that power plants are “by far the largest anthropogenic source of mercury, selenium, hydrogen chloride, and hydrogen fluoride emissions, and a significant source of metallic [hazardous air pollutant] emissions including arsenic, chromium, nickel, and others.” *See id.* at 75,029/2. With respect to mercury risks, EPA highlighted the fact that mercury is a persistent bioaccumulative toxic metal emitted from power plants, and that people are primarily exposed to mercury by eating fish. *See id.* at 75,029/1. EPA explained that a 2011 study focusing on the risks to the most exposed and sensitive individuals in the population estimated that 29 percent of modeled watersheds potentially have sensitive populations at risk from mercury exposure, and 10 percent of modeled watersheds in which mercury deposition is attributable to power plants alone are the source of potential exposures that exceed the reference dose for methylmercury. *See id.* at 75,029/2. EPA also described how mercury is highly toxic to multiple human and animal organ systems, and is particularly dangerous to developing fetuses because chronic low-dose exposure has been associated with poor performance on neurobehavioral tests. *See id.* With respect to risks from non-mercury hazardous air pollutants, EPA explained that exposure to high levels are associated with a variety of adverse health effects including lung, skin, nervous system, and kidney problems, and

cancer. *See id.* at 75,029/1-2. Finally, EPA pointed to the significant emission reductions that the Standards were expected to obtain. *See id.* at 75,033.⁵

After weighing its cost findings and the serious public health and environmental risks associated with hazardous air pollutant emissions from power plants and the significant reductions of these pollutants that are obtained through the Standards, EPA proposed to find that the preferred approach supported the conclusion that “the significant advantages of regulating these emissions outweigh the costs of regulation.” *Id.* at 75,039/2.

In addition to its preferred approach, EPA also identified a second approach for considering cost for the appropriate and necessary finding—the formal benefit-cost analysis contained in the RIA conducted for the Standards. The RIA described many benefits that could not be monetized, and estimated that the Standards would yield between \$33 and \$90 billion annually in benefits that could be monetized, which far outweighed the estimated \$9.6 billion in annual costs. Thus, the RIA concluded that the net benefit of the Standards to society were significant. *See* RIA at 8-1, JA0595.

⁵ All of these findings were made in numerous key risk documents in the record for the 2000 Finding and the 2012 reaffirmation, were subject to challenge in *White Stallion*, and were not disturbed by this Court’s decision or by the Supreme Court’s decision in *Michigan*. *See White Stallion*, 748 F.3d at 1234-1258; *Michigan*, 135 S. Ct. at 2706-2712. EPA did not reopen these issues in the Supplemental Finding. Therefore, these findings are not at issue here.

EPA explained in the Proposed Rule that the formal benefit-cost approach, where as many consequences of the rulemaking as possible are quantified in dollars, was not the best approach for considering cost because (1) numerous categories of benefits are difficult, if not impossible, to monetize, which causes an underestimation of benefits, and (2) “national-level benefit-cost analyses may not account for important distributional effects, such as impacts to the most exposed and most sensitive individuals in a population.” *See* Proposed Rule, 80 Fed. Reg. at 75,039/3-40/1.

Indeed, EPA was unable to quantify many important benefits of the Standards, including the majority of the public health benefits associated with reductions in hazardous air pollutants, which are the focus of the Standards. EPA was able to quantify only a small subset of health benefits related to reducing mercury (the \$4-6 million value on which Petitioners seek to focus the benefit-cost analysis, *see* Pet. Br. 56), and could not quantify other health and environmental benefits related to reducing mercury or other hazardous air pollutants. *See id.* at 75,040/2.

Nevertheless, EPA found in the RIA that the *quantifiable* benefits of the Standards outweighed the costs by tens of billions of dollars because EPA could quantify direct ancillary benefits obtained by the Standards—*i.e.* the co-benefit of PM reductions that necessarily result from the installation of hazardous air pollutant controls. *See* RIA at 5-1, JA0562. The projected reductions in fine PM that would result from compliance with the Standards annually would result in between 4,200 and

11,000 fewer premature deaths from respiratory and cardiovascular illness; 3,100 fewer emergency room visits for children with asthma; over 250,000 fewer cases of respiratory symptoms and asthma exacerbation in children; and 4,700 fewer non-fatal heart attacks. *See* 77 Fed. Reg. at 9429 (Table 9); *see also* 77 Fed. Reg. at 9305-06. EPA thus proposed to find that the benefit-cost analysis approach independently supported EPA's finding that it is appropriate and necessary to regulate power plants' hazardous air pollutant emissions. *See* Proposed Rule, 80 Fed. Reg. at 75,040-41.

EPA finalized its supplemental finding in the rule at issue here, "Supplemental Finding That It Is Appropriate and Necessary To Regulate Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units." 81 Fed. Reg. 24,420 (Apr. 25, 2016) ("Supplemental Finding"). In the Supplemental Finding, EPA stated that it "did not receive any public comments that caused the agency to conclude that the interpretation of the statute or the approaches for consideration of cost that were detailed in the proposed action were in error." 81 Fed. Reg. at 24,425. EPA did, however, supplement its consideration of the annual capital expenditures in response to comments by adding information on historical total production expenditures to the estimate of power sector expenditures for 2000-2011. EPA concluded that the estimated \$9.6 billion annual cost of the Standards represents only a small fraction of the power sector's annual capital and production expenditures in recent years, ranging between 4.2 and 6.4 percent of total expenditures. *See id.* at 24,425, 26/1. Thus, EPA concluded that "the additional analysis reinforces EPA's

conclusion that the cost of compliance with [the Standards] is reasonable” under the preferred approach. *See id.* at 24,426/2.

Invoking the Administrator’s discretion and expert judgment to weigh relevant factors under CAA section 112(n)(1)(A), *id.* at 24,420, the Agency concluded that the metrics considered by the Agency “are reasonable evaluations of cost and that the cost of [the Standards] is reasonable[,]” that “the power industry can comply with [the Standards] while continuing to . . . provide consumers with a reliable source of electricity at a reasonable price,” that “the benefits (monetized and non-monetized) of [the Standards] are substantial and far outweigh the costs,” and that “a consideration of cost does not cause the agency to alter its previous conclusion that regulation of [hazardous air pollutant] emissions from [power plants] is appropriate and necessary.” *Id.* at 24,427.

IV. ERRORS IN PETITIONERS’ STATEMENT OF THE CASE

Petitioners’ lengthy Statement of the Case includes many erroneous statements regarding the history of the regulation of power plants’ hazardous air pollutant emissions under CAA section 112, which should be disregarded.

Examples of such errors include:

(1) Petitioners wrongly suggest that prior rules found that hazardous air pollutant emissions from power plants did not pose a significant public health risk, Pet. Br. 4, but in fact EPA made no such findings, *see* 40 Fed. Reg. 48,292, 48,298 (Oct. 14, 1975) (stating only that emissions were being studied and standards would

be modified as new evidence became available); 52 Fed. Reg. 8724, 8725 (Mar. 19, 1987) (stating that EPA had not fully addressed impacts of mercury emissions in water and methylmercury accumulation in food, and that the Agency was still studying the broader effects of mercury emissions from power plants).

(2) Petitioners state that controls installed for the Acid Rain Program “also lowered [power plants’ hazardous air pollutant emissions] beyond already low pre-1990 levels,” Pet. Br. 6, but the report cited by Petitioners says nothing about hazardous air pollutant reductions attributable to the Acid Rain Program, and EPA has concluded that even after implementation of other provisions of the CAA, levels of hazardous air pollutant emissions from power plants are reasonably anticipated to pose hazards to public health, *see* 77 Fed. Reg. at 9362-63.

(3) Petitioners mischaracterize the 2000 finding as EPA’s conclusion that regulation of mercury from coal-fired power plants and nickel from oil-fired power plants was appropriate and necessary, Pet. Br. 10; in fact, EPA found it appropriate to regulate hazardous air pollutant emissions from coal-fired power plants due to the public health and environmental concerns related to mercury, and noted concerns related to non-mercury metals in general, but made no explicit finding for nickel, *see* 65 Fed. Reg. at 79,827, 79,830.

(4) Petitioners mischaracterize EPA’s 2012 reaffirmation of public health and environmental risks posed by hazardous air pollutant emissions from power plants as “relatively small” and “not changed much from EPA’s previous

assessments,” Pet. Br. 13, but the record shows that EPA “conducted additional, extensive technical analyses based on recent data” for the 2012 reaffirmation, *see* 77 Fed. Reg. at 9365.

(5) Petitioners list purported EPA findings in the Standards, Pet. Br. 16; but EPA made no such findings, *see generally* RIA, JA0393-0597; instead, the list appears to reflect assertions made in comments, *see* UARG Comments, Ex. 1 *The American Energy Initiative, Part 15: What EPA’s Utility MACT Rule Will Cost U.S. Consumers: Hearing Before the Subcomm. on Energy & Power of the H. Comm. on Energy & Commerce*, 112th Cong. (2012) (statement of Anne E. Smith, Ph.D., at 6, Tbl. 1) [EPA-HQ-OAR-2009-0234-20557], JA1040.

STANDARD OF REVIEW

EPA determined that the Supplemental Finding is a rulemaking to which CAA section 307(d) applies. *See* Proposed Rule, 80 Fed. Reg. at 75042/2; Supplemental Finding, 81 Fed. Reg. at 24,421/2-3. Accordingly, under CAA section 307(d), this Court may reverse EPA’s action only if it is found to be “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law; . . . [or] in excess of statutory jurisdiction, authority, or limitations, or short of statutory right.” 42 U.S.C. § 7607(d)(9). This is a narrow, deferential standard of review that prohibits this Court from substituting its judgment for that of the agency. *Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). Indeed, under this standard of review, this Court must not disturb an agency action unless the Agency

relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.

Id. at 43.

Additionally, the Court reviews an agency's interpretation of a statute it administers under the familiar two-step framework established by the Supreme Court in *Chevron, USA, Inc. v. NRDC, Inc.*, 467 U.S. 837, 842-43 (1984). *Chevron* requires that this Court consider "whether Congress has directly spoken to the precise question at issue[;]" if so, that is the end of the inquiry, and the Court must apply the plain terms of the statute. *Id.* If, however, this Court finds that Congress has not spoken directly to the precise question at issue, the Court must determine whether the Agency "based [its interpretation] on a permissible construction of the statute." *Id.* at 843.

EPA's factual findings are likewise entitled to substantial deference. *See Arkansas v. Oklahoma*, 503 U.S. 91, 110-13 (1992). Indeed, this Court gives EPA particular deference "when it acts under unwieldy and science-driven statutory schemes like the Clean Air Act." *Nat'l Ass'n of Clean Air Agencies v. EPA*, 489 F.3d 1221, 1229 (D.C. Cir. 2007) (quotations omitted).

SUMMARY OF ARGUMENT

In the Supplemental Finding, EPA responded to the limited holding and remand in *Michigan v. EPA* and concluded that after considering cost under both its preferred approach and an independent benefit-cost approach, it remains appropriate

and necessary to regulate hazardous air pollutant emissions from power plants under CAA section 112. Contrary to Petitioners' arguments, each of EPA's two independent approaches, and the interpretations of the CAA included in them, are reasonable and fully satisfy EPA's obligation to consider cost under *Michigan* and the statute.

First, under EPA's preferred approach, EPA reasonably interpreted CAA section 112(n)(1)(A)'s ambiguous language as allowing the Administrator to exercise her discretion and expert judgment in weighing factors relevant to the appropriate and necessary determination, and to consider cost as one relevant factor to be weighed with important public health and environmental factors. EPA's interpretation is supported by *Michigan* and black letter administrative law, which confer broad discretion on an agency to weigh relevant statutory factors when, as here, the statutory language does not specify *how* the agency is to weigh such factors. EPA's interpretation is also supported by the specific context of CAA section 112(n)(1) as well as the framework and aims of CAA section 112 more generally.

Moreover, EPA reasonably implemented its interpretation under the preferred approach by first evaluating the cost of the Standards in light of power sector revenues, expenditures, and historical rate changes, and by examining the sector's ability to incur the cost of the Standards while maintaining an adequate supply of electricity. EPA further examined the cost of the Acid Rain Program, as well as the downward trend of the cost of mercury and non-mercury hazardous air pollutant

controls over time. After determining that the cost of the Standards is reasonable, EPA then weighed that conclusion with the significant public health and environmental risks addressed by the Standards and concluded that a consideration of cost did not cause the Agency to alter its prior finding that it is appropriate and necessary to regulate power plants' hazardous air pollutant emissions under CAA section 112. The Administrator's weighing of relevant factors should be upheld because it is well-supported by the record.

Under EPA's second, independent approach for considering cost, EPA relied on the benefit-cost analysis previously conducted for the Standards to conclude that the benefits of the Standards significantly outweigh the costs. EPA acknowledged that a benefit-cost analysis is not the optimal approach in this context because many of the benefits associated with reducing hazardous air pollution cannot be monetized and because national-level benefit-cost analyses do not account for distributional impacts to the most exposed and sensitive populations. Nevertheless, the benefit-cost analysis demonstrated the appropriateness of regulating power plants. EPA was able to quantify a small subset of benefits related to a reduction in mercury emissions as well as the direct ancillary benefits of reducing PM that necessarily occur through the installation of the control technology that reduces hazardous air pollutant emissions. Contrary to Petitioners' argument, EPA's interpretation of CAA section 112(n)(1)(A) as allowing a consideration of such "co-benefits" under a benefit-cost analysis is supported by the statute and legislative history, widely-accepted economic principles

contained in executive branch guidance documents, and long-standing agency practice.

Finally, Petitioners' arguments that EPA should have considered certain alternative regulatory approaches and other costs raised in comments are without merit. EPA was not required to consider alternative approaches to CAA section 112 regulation, and in any event, EPA explained why the alternatives proposed in comments were unworkable. Second, EPA thoroughly considered all non-speculative costs raised in comments on the Proposed Rule.

In summary, EPA promulgated a robust response to the Supreme Court's decision in *Michigan*, fully satisfying its obligation to consider cost for purposes of CAA section 112(n)(1)(A) under two independently valid approaches. Petitioners' arguments against these approaches and arguments that EPA should have considered other alternatives and costs are without merit. Accordingly, the petitions for review should be denied.

ARGUMENT

I. EPA'S PREFERRED APPROACH REASONABLY SATISFIES EPA'S OBLIGATION TO CONSIDER COST.

A. EPA Reasonably Interpreted CAA Section 112(n)(1)(A) Under the Preferred Approach.

Under EPA's preferred approach, EPA interpreted CAA section 112(n)(1)(A) as not requiring a formal benefit-cost analysis, but rather as allowing the Administrator broad discretion to exercise her expert judgment in determining how to

consider and weigh all relevant factors in making the appropriate and necessary finding. *See* Legal Memorandum 6, 15, 18-19, 20-22, JA0024, 0033, 0036-0037, 0038-0040. Accordingly, EPA interpreted CAA section 112(n)(1)(A) as allowing the Administrator discretion to consider cost as one important factor to be weighed with other important public health and environmental factors associated with the hazardous air pollutants emitted by power plants. *See* Proposed Rule, 80 Fed. Reg. at 75,030/3-31/1; Legal Memorandum 6-21, JA0024-0039; Supplemental Finding, 81 Fed. Reg. at 24,426/1-2 (adopting the interpretations laid out in the Proposed Rule and Legal Memorandum). These interpretations of CAA section 112(n)(1)(A) must be upheld because they are consistent with *Michigan* and fundamental principles of administrative law, the context of CAA section 112(n)(1), and the framework and aims of the amended CAA section 112 generally. *See Chevron*, 467 U.S. at 842-43.

1. *EPA's interpretation that the Administrator retained broad discretion to balance relevant factors under CAA section 112(n)(1)(A) is consistent with Michigan and black letter administrative law.*

Petitioners misconstrue the Supreme Court's holding in *Michigan* by suggesting that the Court mandated a *particular* method of weighing benefits against costs (*i.e.*, a formal benefit-cost analysis). *See* Pet. Br. 28-41, *see, e.g.*, Pet. Br. 28 ("EPA 'interpret[ed] . . . section 112(n)(1)(A) as not requiring a benefit-cost analysis'—*i.e.*, that EPA need not compare benefits to costs in order to determine whether the benefits outweigh the costs."), 36 ("This is not the cost-benefit analysis called for by *Michigan* or the statute.").

In fact, the Supreme Court stated that “[w]e need not and do not hold that the law unambiguously required the Agency, when making this preliminary estimate, to conduct a formal cost-benefit analysis in which each advantage and disadvantage is assigned a monetary value.” *Michigan*, 135 S. Ct. at 2711. Instead, the Supreme Court merely held that “[t]he Agency must consider cost—including, most importantly, cost of compliance—before deciding whether regulation is appropriate and necessary.” *Id.* at 2711; *see also id.* at 2707 (“Read naturally in the present context, the phrase ‘appropriate and necessary’ requires *at least some attention* to cost”) (emphasis added), 2708 (“[R]easonable regulation ordinarily requires *paying attention to* the advantages and the disadvantages of agency decisions”) (emphasis added). Moreover, the Supreme Court explicitly left it to “the Agency to decide (as always, within the limits of reasonable interpretation) how to account for cost.” *Id.* at 2711.

Indeed, the statute is utterly silent with respect to how EPA must consider cost when making the appropriate and necessary determination under CAA section 112(n)(1)(A). *See* 42 U.S.C. § 7412(n)(1)(A); *see also Michigan*, 135 S. Ct. at 2707 (acknowledging that the word “appropriate” “leaves agencies with flexibility”). No formal benefit-cost analysis is explicitly required, nor does the framework of the statute support such a reading. *See* Legal Memorandum 21-22 (explaining that Congress did not require benefit-cost analyses at any stage of the CAA section 112 rulemaking process, and that the preliminary stage at which the appropriate and necessary determination is made does not allow for credible estimates of costs and

benefits necessary for benefit-cost analyses⁶). Moreover, the statute does not assign weights by which the Agency must balance the relevant factors. *See* 42 U.S.C. § 7412(n)(1)(A); *see also* Legal Memorandum 15, 18-21, JA0033, 0036-0039.⁷

Where statutes are ambiguous with respect to how agencies must weigh relevant factors, black letter administrative law dictates that courts defer to “a reasonable accommodation of conflicting policies that were committed to the agency’s care by the statute.” *U.S. v. Shimer*, 367 U.S. 374, 383 (1961); *see also Chevron v. NRDC*, 467 U.S. 837, 865 (1984) (“[T]he Administrator’s interpretation represents a reasonable accommodation of manifestly competing interests and is entitled to deference.”). “When a challenge to an agency construction of a statutory provision . . . really centers on the wisdom of the agency’s policy, rather than whether it is a reasonable choice within a gap left open by Congress, the challenge must fail.”

Chevron, 467 U.S. at 866.

⁶ A determination that it is appropriate and necessary to regulate power plants under CAA section 112 triggers a duty to promulgate emission standards within two years. *See* 42 U.S.C. § 7412(c)(5). Thus, Congress would not have expected the precise costs and benefits of emission standards to be known at the time of an appropriate and necessary determination. *See* Legal Memorandum 21-22, JA0039-0040.

⁷ Unlike CAA section 112, other provisions of the CAA explicitly require benefit-cost analyses or a finding that benefits outweigh costs. *See, e.g.*, 42 U.S.C. § 7545(c)(2)(B) (explicitly requiring a consideration of a “cost benefit analysis” before controlling or prohibiting fuels or fuel additives for non-road engines and vehicles); *id.* § 7503(a)(5) (explicitly requiring an analysis that “demonstrates that benefits of the proposed source significantly outweigh the environmental and social costs imposed” before issuance of a permit).

This Court has long held that where Congress instructs an agency to consider certain factors but does not assign any particular weights to those factors, the agency has broad discretion to weigh them as the agency sees fit. In *Weyerhaeuser Co. v Costle*, for example, this Court concluded that EPA was not required to balance “cost versus the effluent reduction benefits” and “non-water quality environmental impacts” of the regulation at issue to “arrive at a ‘net’ environmental benefit conclusion” because Congress had merely identified factors that EPA must consider. 590 F.2d 1011, 1044 (D.C. Cir. 1978). This Court stated that “so long as EPA pays some attention to the congressionally specified factors, the section on its face lets EPA relate the various factors as it deems necessary” and reviewed EPA’s action “only to determine if EPA was fully aware of [the factors] and reached its own express conclusions about them.” *See id.* at 1046-47. *See also Lignite Energy Council v. EPA*, 198 F.3d 930, 933 (D.C. Cir. 1999) (“Because section 111 does not set forth the weight that should be assigned to each of these factors, we have granted the agency a great degree of discretion in balancing them[;] EPA’s choice will be sustained unless the environmental or economic costs of using the technology are exorbitant.”); *NRDC, Inc. v. EPA*, 25 F.3d 1063, 1071 (D.C. Cir. 1994) (“[N]either RCRA nor EPA’s regulations purports to assign any particular weight to the factors listed[.] That being the case, the Administrator was free to emphasize or deemphasize particular factors, constrained only by the requirements of reasoned agency decisionmaking.”); *New York v. Reilly*, 969 F.2d 1147, 1153 (D.C. Cir. 1992) (“Because the CAA allows EPA to balance air

and nonair benefits and costs, which it did, EPA's decision . . . was neither arbitrary nor capricious."). Moreover, this Court has held that "[a]n agency is free to adopt a totality-of-the-circumstances test to implement a statute that confers broad discretionary authority even if that test lacks a definite 'threshold' or 'clear line of demarcation to define an open-ended term.'" *Catamba County v. EPA*, 571 F.3d 20, 39 (D.C. Cir. 2009) (quoting *PDK Labs, Inc. v. DEA*, 438 F.3d 1184, 1195 (D.C. Cir. 2006)). "To be reasonable, such an 'all-things-considered standard' must simply define and explain the criteria the agency is applying." *Id.*

Thus, under *Michigan* and fundamental principles of administrative law, EPA was not required to conduct a formal benefit-cost analysis or find that quantifiable benefits exceed costs, but rather EPA retained broad discretion to determine how to consider and weigh the relevant factors, including costs, under the statute. As held in *Michigan*, EPA is free to determine "how to account for cost." *Michigan*, 135 S. Ct. at 2711.

2. *EPA's interpretation that cost is one important factor to be weighed with public health and environmental factors is consistent with the statutory context of CAA section 112(n)(1) and the framework and aims of the amended CAA section 112.*

EPA's interpretation that cost is one important factor to be weighed with public health and environmental factors associated with power plants' hazardous air pollutant emissions, but should not be treated as a predominant or overriding factor,

must be upheld as reasonable because it is supported by CAA section 112(n)(1) and the framework and aims of the amended section 112.

a. EPA's interpretation is consistent with CAA section 112(n)(1).

Section 112 treats power plants differently than other major sources of hazardous air pollutants. *See* 42 U.S.C. § 7412(n)(1); *see also White Stallion*, 748 F.3d 1230-31, *Michigan*, 135 S. Ct. at 2707. Instead of automatic listing under section 112(c)(1) based on the volume of their emissions of hazardous air pollutants, as is required for all other major source categories, Congress required that EPA conduct certain studies related to power plants' emission of hazardous air pollutants and regulate those emissions only if EPA concluded that doing so was appropriate and necessary. 42 U.S.C. § 7412(n)(1)(A).

Specifically, EPA was required to “perform a study of the hazards to public health reasonably anticipated to occur as a result of emissions by [power plants] . . . after imposition of the requirements of [the CAA]” (the Utility Study) within three years of the 1990 amendments. 42 U.S.C. § 7412(n)(1)(A). Additionally, EPA was required to conduct a second study (the Mercury Study) within four years of the amendments under CAA section 112(n)(1)(B). *See id.* § 7412(n)(1)(B). In the Mercury Study, EPA was instructed to study mercury emissions from power plants and other sources and was specifically instructed to report “the rate and mass” and “health and environmental effects of such emissions,” available control technologies, and the costs of such technologies. *Id.* As EPA explained in the Legal Memorandum, “the

Mercury Study provided an accounting and evaluation of the scope of the mercury problem, across all sources, and a basis upon which to determine the human health and environmental effects of the mercury emissions from such sources.” Legal Memorandum 13, JA0031.

Finally, CAA section 112(n)(1)(C) required a report by the National Institute of Environmental Health Sciences of “the threshold level of mercury exposure below which adverse human health effects are not expected to occur.” 42 U.S.C.

§ 7412(n)(1)(C). In addition, in 1998, the National Academy of Sciences was tasked with advising EPA with respect to the development of a reference dose for methylmercury—*i.e.*, an estimate of daily exposure experienced over a lifetime that is likely to be without a risk of adverse health effects to humans, including sensitive subpopulations. *See* Legal Memorandum 14, JA0032. A House conference report directed EPA to fund the study, and indicated that EPA should not make the appropriate and necessary finding in section 112(n)(1)(A) until EPA had reviewed the results of that study. *See id.* (citing H.R. Conf. Rep. No. 105-769 at 281-282 (1998), JA1936-37).

As EPA explained in the Legal Memorandum, these mandated studies, which were required to be conducted within a short time after the 1990 amendments, “focus on potential hazards to public health and the environment, including the potential hazards to the most sensitive members of the population.” *Id.* Indeed, EPA was required to consider the cost of available control technologies only in the Mercury

Study, as one of several required considerations, while the other two studies focused exclusively on risk to public health. *See* Legal Memorandum 15, JA0033; *see also* 42 U.S.C. § 7412(n)(1). Thus, the studies required as relevant to the Agency’s decision to regulate power plants under CAA section 112 support EPA’s interpretation that “cost is one of the several factors that EPA must consider in addition to the other relevant factors identified in the statute,” and that while cost is certainly an important factor, “section 112(n)(1) does not support a conclusion that costs should be the predominant or overriding factor.” Legal Memorandum 15, JA0033.

b. EPA’s interpretation is consistent with the framework and aims of the amended CAA section 112.

The framework and aims of the amended CAA section 112 also support EPA’s interpretation. Most relevant here, in the 1990 amendments, Congress established a two-stage approach for regulating emissions of 189 listed hazardous air pollutants under CAA section 112. *See id.* § 7412(c), (d). In the first stage, Congress required EPA to list major sources and area sources of hazardous air pollutants and promulgate technology-based emission standards for listed source categories. *See* 42 U.S.C. §§ 7412(c) (listing of source categories); 7412(d) (emission standards). Notably, Congress prohibited EPA from considering cost in decisions to list major and area sources. For major sources, decisions to list are made solely based on whether any stationary source in the source category emits or has the potential to emit 10 tons per year of any hazardous air pollutant or 25 tons per year or more of a

mixture of hazardous air pollutants. *See* 42 U.S.C. § 7412(c)(1). For area sources, decisions to list are made based on whether EPA finds that the category “presents a threat of adverse effects to human health or the environment” and whether regulation is necessary to ensure 90 percent of area source emissions of certain key pollutants are subject to regulation. *Id.* § 7412(c)(3).

Congress also instituted a rigorous standard by which source categories can be de-listed—EPA may not de-list a source category if even one source in the category emits hazardous air pollutants at levels that may cause a lifetime cancer risk greater than one in one million to the person in the population that is most exposed to the hazardous air pollutants from the source category. *See id.* § 7412(c)(9)(B); *see also New Jersey v. EPA*, 517 F.3d 574, 581-84 (D.C. Cir. 2008). Thus, in mandating the category listing and de-listing process, Congress was focused on addressing risk to human health (including sensitive subpopulations) and the environment from what Congress determined to be inherently hazardous pollutants, and Congress did not intend or allow cost to trump those factors.

Also in the first stage, Congress replaced the pre-1990 requirement to set emission standards for listed source categories based on risk to human health with a requirement that such standards be set based on “the maximum degree of reduction” achievable “taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements,” (MACT standards). *Id.* § 7412(d)(2). Congress also set “floors”—minimum

stringency levels—based on the level of control already achieved by sources in the category. *Id.* § 7412(d)(3). As EPA explained in the Legal Memorandum, “[t]he inclusion of these MACT floors in the CAA amendments of 1990 reflects a determination by Congress that it is reasonable to require all sources to perform at the level actually achieved in practice by the best performing similar sources in the source category.” Legal Memorandum 7, JA0025. EPA further explained that “section 112(d)(3) ensures [MACT floors] will be technologically feasible and cost reasonable because they are based on the levels of control already achieved by existing sources.” *Id.* at 9, JA0027. Thus, Congress required that cost be taken into account in setting MACT standards, but did not allow cost to trump public health and environmental factors.

In the second stage of CAA section 112 regulation, Congress required EPA to consider whether residual risks remaining after implementation of the MACT standards are such that more stringent standards are required to provide an ample margin of safety to protect public health or prevent an adverse environmental effect. 42 U.S.C. § 7412(f)(2)(A). Cost is not relevant to the identification of remaining risks or the evaluation of whether those risks are acceptable, but can be considered when setting an “ample margin of safety” to address the remaining risks. *See id.* § 7412(f)(1)-(2); *see also* 54 Fed. Reg. 38,044 (Sept. 14, 1989). Cost is also listed as one of several factors to be considered in determining whether additional regulation is necessary to prevent an adverse environmental effect. *Id.* § 7412(f)(2)(A).

Additionally, Congress required EPA to revisit emission standards every eight years, and revise the standards “as necessary (taking into account developments in practices, processes, and control technologies),” which includes a consideration of cost. *See id.* § 7412(d)(6); *see also* Legal Memorandum 8, JA0026. Thus, as under the first stage of CAA section 112 regulation, cost is one factor taken into account along with public health and environmental factors, but does not trump those other factors under the second stage.

Finally, Congress also included in CAA section 112 a series of rigorous deadlines by which EPA must complete its obligations under the amended statute. *See* 42 U.S.C. § 7412(e)(1); *see also id.* § 7412(n)(1) (requirement to conduct studies within short timeframe). As EPA explained in the Legal Memorandum, the 1990 amendments therefore reflect Congress’s understanding that listed hazardous air pollutants are inherently harmful (hence the requirement that EPA automatically list all major sources of hazardous air pollutants without a specific finding of risk), and Congress’s desire that prompt and permanent reductions of those pollutants be achieved (hence the requirement that EPA review MACT standards regularly). *See* Legal Memorandum 9-10, JA0027-0028. At each stage in the process, cost is only one factor to be considered along with public health and environmental risks, and it does not dominate or override other factors. Thus, the framework and aims of the amended CAA section 112 support EPA’s interpretation. *See id.* at 11, JA0029.

B. EPA Appropriately Weighed The Relevant Factors.

Not only does Petitioners' first argument misconstrue *Michigan's* holding with respect to EPA's discretion to consider cost for purposes of the appropriate and necessary finding, that first argument also misunderstands the mechanics of EPA's preferred approach. Petitioners argue that EPA "consider[ed] costs in the abstract," Pet. Br. 29, "walled off its cost analysis from any comparison to the benefits," *id.* at 33, "focus[ed] [] solely on whether the electric utility industry as a whole could 'absorb' the costs," *id.* at 35, and failed to weigh benefits "against [] exceptionally large costs." *Id.* at 34. They further argue that there is no material difference between EPA's preferred approach and its 2012 appropriate and necessary determination. *See id.* at 38. But the record demonstrates that in fact, in the Supplemental Finding, EPA thoroughly evaluated costs, which EPA found to be relatively modest compared to sector revenues, expenditures, and historical rate changes, and found that the sector could incur the costs while maintaining an adequate supply of electricity, and then considered those cost factors in light of specific public health and environmental hazards that EPA had already determined exist as a result of hazardous air pollutant emissions from power plants.

Specifically, as explained at length in the Proposed Rule, EPA started with the highest EPA estimate of compliance costs for the Standards—the \$9.6 billion that

EPA estimated the Standards would cost in 2015.⁸ EPA then compared that figure to twelve years of reported power sector revenues based on information from the Energy Information Administration. *See* Proposed Rule, 80 Fed. Reg. at 75,033/2. This kind of analysis is frequently used to determine the potential impacts of compliance costs on regulated industries. *See id.* EPA concluded that when revenues were at their highest, the compliance cost would represent only 2.7 percent of revenues, and when revenues were at their lowest, compliance costs would represent only 3.5 percent of revenues. *See id.* EPA thus concluded that even EPA's most conservative estimate of annual compliance costs would represent only a small fraction of the value of overall power sector revenues. *See id.* at 75,033/3.

Next, EPA compared the incremental annual capital expenditures, which were estimated to be \$2.4 billion of the \$9.6 billion, to annual capital expenditures collected by two different sources over twelve years. *See id.* at 75,034. For the capital expenditures collected by SNL (a private sector firm that provides data and analytical services), incremental capital expenditures for the Standards represent only 5.9 percent of the *lowest* annual capital expenditures by the power sector. *See id.* at

⁸ EPA estimated that compliance costs would decrease over time and that compliance costs for 2020 and 2030 would be \$8.6 billion and \$7.4 billion, respectively. *See* Proposed Rule, 80 Fed. Reg. at 75,033/2. Indeed, some commenters provided EPA with information that the annual compliance cost is much lower than estimated in the RIA, totaling only \$2 billion. *See* Response to Comments for Supplemental Finding ("RTC") [EPA-HQ-OAR-2009-0234-20578] 58, JA1266.

75,034/2. For the capital expenditures reported by the U.S. Census Bureau, incremental expenditures for the Standards represent only 5.3 percent of the lowest annual capital expenditures. *See id.* For both sources, incremental capital expenditures represented only 3 percent of the highest annual capital expenditures. *See id.* at 74,034/1. When EPA updated its information to include historical total production expenditures, EPA concluded that compliance costs represented between 4.2 and 6.4 percent of total expenditures. *See* 81 Fed. Reg. at 24,426/1. Thus, EPA again concluded that the estimated \$2.4 billion in incremental capital expenditures “is well within the range of annual variability[.]” *Id.* at 75,034/2.

Additionally, EPA acknowledged that in some electricity markets, costs imposed on utilities can be fully or partly passed through to consumers. Accordingly, EPA compared estimated rate changes expected as a result of the Standards to price changes that have occurred over twelve years. *See id.* at 75,035. EPA found that the average estimated increase of 0.3 cents per kilowatt-hour due to compliance with the Standards would result in a 3.1 percent average price increase. *See id.* at 75,035/1. EPA explained that over the twelve years studied, average retail prices fluctuate annually ranging from a decrease of 0.2 cents per kilowatt hour to an increase of 0.5 cents per kilowatt hour. *See id.* Thus EPA concluded that the 0.3 cent increase was “well-within normal historical fluctuations.” *See id.* at 75,035/2. Accordingly, EPA appropriately concluded that under each of these three metrics, the cost of compliance is reasonable. Supplemental Finding, 81 Fed. Reg. at 24,424/3.

EPA then went further in its analysis of cost to ensure that the power sector could comply with the Standards while maintaining a reliable supply of electricity. *See* Proposed Rule, 80 Fed. Reg. at 75,035/3-75,036/3. EPA explained that expected coal-fired capacity retirements as a result of the Standards totaled less than 0.5 percent of total projected capacity. *See id.* at 75,036/1. EPA also explained that most of the units projected to retire were older, smaller in terms of capacity, and less frequently used than those that would continue operating. *See id.* at 75,036/3. Accordingly, EPA concluded that “the vast majority of the generation capacity in the power sector directly affected by the [the Standards] would be able to absorb the anticipated compliance costs and remain operational.” *Id.* at 75,036/3.

EPA went further still in its analysis of cost and examined the cost of the Acid Rain Program, mercury controls, and non-mercury hazardous air pollutant controls. EPA found that the Acid Rain Program “has been extremely successful in reducing emissions of [sulfur dioxide (“SO₂”)] and [nitrogen oxide] from the utility power sector, and the cost of the [Program] has been shown to be much less than what was initially estimated (up to 70 percent lower than initial estimates).” *Id.* at 75,037/1. This cost savings was a result of many sources choosing other compliance strategies over the installation of scrubbers, which in turn decreased the anticipated co-benefit of hazardous air pollutant emission reductions that was originally expected when Congress passed the 1990 CAA amendments. *See id.* EPA likewise found that the

costs of mercury controls and non-mercury hazardous air pollutant controls have both declined considerably over time. *See id.* at 75,037/3-38/1.

Along with its well-supported cost conclusions, which Petitioners do not specifically dispute, EPA weighed the identified risks to human health and the environment posed by power plants' hazardous air pollutant emissions and the considerable reductions in the volume of hazardous air pollutant emissions that would result from implementation of the Standards. These specific public health and environmental risks were identified in the 2000 finding and the 2012 Standards, were upheld to the extent challenged in *White Stallion*, and were not affected by the Supreme Court's decision in *Michigan*.

In the Supplemental Finding EPA highlighted the fact that power plants are “by far the largest remaining source of mercury, selenium, hydrogen chloride, and hydrogen fluoride emissions, and a major source of metallic [hazardous air pollutant] emissions including arsenic, chromium, nickel, and others . . . [.]” that hazardous air pollutant emissions from power plants pose significant hazards to public health and the environment that will not be addressed through imposition of the other requirements of the CAA, and that there are controls available to reduce hazardous air pollutant emissions from power plants. *See Proposed Rule*, 80 Fed. Reg. at 75,038/1. EPA described the serious public health and environmental effects associated with hazardous air pollutant emissions from power plants. *See id.* at 75,028/3-29. And EPA also highlighted the fact that in 2015 alone, the Standards were estimated to

reduce annual emissions of mercury by 75 percent, hydrogen chloride by 88 percent, and fine PM (a surrogate for all non-mercury metallic hazardous air pollutants) by 19 percent from large coal-fired power plants. *See id.*

After weighing the reasonable cost of the Standards with these significant public health and environmental factors, all of which Congress deemed important when it amended CAA section 112 in 1990, EPA concluded that “consideration of cost does not cause [EPA] to alter [its] determination that it is appropriate and necessary to regulate [hazardous air pollutant] emissions from [power plants].” Supplemental Finding, 81 Fed. Reg. at 24,427/2.

EPA’s extensive analysis under the preferred approach establishes that, contrary to Petitioners’ arguments, EPA did not consider costs just in the abstract, consider only whether the industry could “absorb” costs, or fail to weigh costs against benefits. Instead, the record demonstrates that EPA thoroughly considered a number of cost factors and weighed them with the identified risks posed by hazardous air pollutant emissions from power plants. This Court has upheld less rigorous EPA approaches to considering costs in implementing the CAA. *See, e.g., U.S. Sugar Corp. v. EPA*, 830 F.3d 579, 616 (D.C. Cir. 2016) (finding that EPA adequately considered cost and other factors for purposes of EPA’s beyond-the-floor standards without a benefit-cost analysis or a finding that benefits outweighed costs); *Lignite Energy Council v. EPA*, 198 F.3d 930, 933 (D.C. Cir. 1999) (finding that EPA appropriately considered costs because the standards at issue “will only modestly increase the cost

of producing electricity in newly constructed boilers”); *Portland Cement Ass’n v. EPA*, 513 F.2d 506, 508 (D.C. Cir. 1975) (explicitly stating that a benefit-cost analysis was not required for EPA’s response to the court’s remand and upholding EPA’s consideration of cost where “[t]he industry has not shown inability to adjust itself in a healthy economic fashion to the end sought by the Act as represented by the standards prescribed”).

In summary, EPA may have weighed the relevant factors under CAA section 112(n)(1)(A) differently than Petitioners would have liked, and certainly reached a conclusion different than what Petitioners would have preferred, but EPA’s approach and conclusion were thoroughly explained and well-supported by the record. Given the discretion EPA is allowed under the statute, *Michigan*, and this Court’s case law to weigh relevant factors, EPA’s consideration of costs and weighing of costs with hazards to public health and the environment, and its ultimate conclusion, are reasonable. *Motor Vehicle Mfrs. Ass’n*, 463 U.S. at 43. EPA’s preferred approach thus satisfies its duty under the statute and *Michigan*.

C. EPA Was Not Required to Conduct a Pollutant-by-Pollutant Analysis.

Petitioners’ final argument against EPA’s preferred approach, which constitutes only one page of Petitioners’ 70-page brief, lacks merit. *See* Pet. Br. 40-41. As an initial matter, Petitioners’ argument appears to be a poorly-veiled challenge to EPA’s conclusion that it must regulate all hazardous air pollutant emissions from power

plants rather than regulate only some individual pollutants. That conclusion, however, was previously reached in the rule establishing the Standards and was upheld by this Court following challenge in *White Stallion*. See *White Stallion*, 748 F.3d at 1244-45. That legal conclusion was not disturbed by *Michigan*, and was not re-opened by the Supplemental Finding.

Additionally, in response to comments, EPA explained why conducting a pollutant-by-pollutant analysis for purposes of the Supplemental Finding would be “highly uncertain and potentially arbitrary.” See RTC 85-87, 167, JA1293-1295, 1375. Such a determination of cost-effectiveness of controls by individual pollutant is not practical under the Standards because the Standards require control technologies that target many different hazardous air pollutants. *Id.* at 86-87. As an example, EPA pointed to a control technology called a “spray dryer.” *Id.* at 87. That technology is expected to reduce HCl and other hazardous acid gases, mercury and other toxic metals, as well as SO₂ and PM. *Id.* Thus, EPA explained that estimating sector impacts to each pollutant reduced by the spray dryer and then allocating the cost of such technology according to impact “is neither a straightforward nor particularly informative approach to evaluating cost.” *Id.* Such a technical determination is entitled to deference. See *Nat’l Ass’n of Clean Air Agencies*, 489 F.3d at 1229.

In short, EPA’s preferred approach represents a reasonable statutory interpretation of an ambiguous provision of the CAA that is consistent with the *Michigan* decision and black letter administrative law, as well as the context of CAA

section 112(n)(1) and the framework and aims of CAA section 112. Accordingly, EPA's preferred approach should be upheld as satisfying EPA's obligation to consider cost for purposes of its CAA section 112(n)(1)(A) determination that it is appropriate and necessary to regulate hazardous air pollutant emissions from power plants.

II. EPA'S BENEFIT-COST APPROACH IS REASONABLE.

If this Court concludes that EPA reasonably satisfied its obligation to consider cost under the preferred approach (which it should), the Court does not need to address EPA's second approach for considering cost—the benefit-cost approach. Nevertheless, EPA's second approach also independently and reasonably satisfies EPA's obligation to consider cost under CAA section 112(n)(1)(A).

As explained *supra*, CAA section 112(n)(1)(A) does not specify how EPA should consider cost, and the Supreme Court explicitly left EPA the discretion to determine how to account for cost on remand after *Michigan*. See Legal Memorandum 20-25, JA0038-0043. A formal benefit-cost analysis, where every consequence is converted into dollars, is neither required by the statute or *Michigan* nor is it the best approach for considering cost (because some benefits are difficult to monetize and national-level analyses do not account for distributional impacts to the most exposed and sensitive populations). See Proposed Rule, 80 Fed. Reg. at 75,039/3-40/1. Nevertheless, EPA had already conducted a formal benefit-cost analysis—the Regulatory Impact Analysis—for the Standards pursuant to Executive Orders 12866 and 13563. See Proposed Rule, 80 Fed. Reg. 75,039/2-3-40/1. EPA thus pointed to

that analysis as another, independent basis for EPA's determination that it remains appropriate and necessary to regulate hazardous air pollutant emissions from power plants. *See id.* at 75,039/2. Indeed, the RIA demonstrated that the benefits of the Standards outweigh costs by at least 3-to-1 and as much as 9-to-1—the quantified and monetized benefits were estimated at \$33-90 billion annually, while the costs totaled \$9.6 billion annually. *See id.* at 75,040/3.

Petitioners' second argument attacks EPA's benefit-cost approach by arguing that EPA erroneously included the benefits of reducing pollutants that are not hazardous air pollutants in its analysis. *See* Pet. Br. 41-57. Specifically, Petitioners argue that EPA should not have included the monetized "co-benefits" of PM and SO₂ emission reductions, *see id.*, which necessarily occur through the installation of control technology that reduces hazardous air pollutant emissions. As EPA explained in the Proposed Rule,

PM_{2.5} emissions are comprised in part by the mercury and non-mercury [hazardous air pollutant] metals that the [Standards are] designed to reduce. The only way to effectively control the particulate-bound mercury and non-mercury metal [hazardous air pollutants] is with PM control devices that indiscriminately collect all PM along with the metal [hazardous air pollutants]. Similarly, emissions of the acid gas [hazardous air pollutants] . . . are reduced by acid gas controls that are also effective at reducing emissions of SO₂ (also an acid gas, but not a hazardous air pollutant).

Proposed Rule, 80 Fed. Reg. at 75,041/1. *See also* Legal Memorandum at 24, JA0042 ("[T]he relationship between particulate matter hazardous air pollutants and [PM] is so direct that EPA used filterable PM as a surrogate for all non-

mercury metal hazardous air pollutants. . . . [T]he controls required to reduce acid gas [hazardous air pollutants] also reduce SO₂, and the EPA established SO₂ as a surrogate for all acid gas [hazardous air pollutants.]”).

As explained further below, EPA reasonably determined that the benefit-cost approach should include a consideration of *all* benefits of the Standards, including the co-benefits of reducing PM and SO₂. *See* 80 Fed. Reg. at 75,040/3; Supplemental Finding, 81 Fed. Reg. at 24,438/2-3. EPA’s interpretation is reasonable because it is consistent with the statute, legislative history, widely-accepted economic principles contained in executive branch guidance, and long-standing agency practice.

Petitioners’ arguments to the contrary are without merit.

A. EPA’s Interpretation of the Statute Is Reasonable.

1. EPA’s interpretation is consistent with the statute and legislative history.

EPA’s interpretation of CAA section 112(n)(1)(A) as allowing the consideration of co-benefits in a formal benefit-cost analysis is supported by the statute and legislative history. First, the statutory text directing EPA to study the risks that remain after imposition of other parts of the CAA reflects Congress’s understanding that the various provisions of the CAA may have overlapping benefits. *See* 42 U.S.C. § 7412(n)(1)(A); *see also* Legal Memorandum 24-25. Indeed, a report by the Senate Committee on Environment and Public Works stated that,

When establishing technology-based [MACT] standards under this subsection, *the Administrator may consider the benefits* which result from control of air pollutants that are not listed but the emissions of which

are, nevertheless, reduced by control technologies or practices necessary to meet the prescribed limitation. For instance, control technologies that reduce the emission of volatile organic compounds which are listed pursuant to this subsection may also have the effect of limiting other [volatile organic compound] emissions. *These other compounds*, although not listed, would be precursors of ozone pollution and *control, even in attainment areas, may produce substantial health and environmental benefits.*

5 *A Legislative History of the Clean Air Act Amendments of 1990*, at 8512 (emphasis added), JA1613.⁹ Thus, the statutory text and legislative history support EPA's interpretation that co-benefits may be considered in the context of a benefit-cost analysis.

Indeed, in *United States Sugar Corporation v. EPA*, this Court recently upheld EPA's consideration of co-benefits under a similarly ambiguous provision of CAA section 112. 830 F.3d 579, 623-626 (D.C. Cir. 2016). In that case, some petitioners argued that EPA could not consider the co-benefits of reducing other hazardous air pollutants and non-hazardous air pollutants along with HCl in determining whether to use its discretionary authority to set health-based emission standards for HCl under CAA section 112(d)(4). *See id.* at 625. EPA explained that "consideration of these co-benefits was not a regulation of other pollutants; rather, [EPA] was simply choosing

⁹ Petitioners make no mention of this plainly relevant legislative history. The legislative history cited by Petitioners consists of individual statements by U.S. Senators and Representatives, which do not reflect the intent of Congress as a whole, or even the relevant committees within each house. *See, e.g.*, Pet. Br. 6, 32, 48, 59. Moreover, the letter from William K. Reilly and the testimony of William G. Rosenberg cited by Petitioners reflect the views of those individuals at the time they served as the Agency's Administrator and Assistant Administrator, respectively. *See* Pet. Br. 7, 8, 32, 60. They do not reflect the views of Congress, and as explained extensively above, they do not reflect EPA's current views.

not to ignore the purpose of the CAA—to reduce the negative health and environmental effects of [hazardous air pollutants] emissions—when exercising its discretionary authority under the Act.” *Id.* This Court held that

EPA was . . . free to consider potential co-benefits that might be achieved from enforcing the HCl MACT floor. Section 7412(d)(4)’s text does not foreclose the Agency from considering co-benefits and doing so is consistent with the CAA’s purpose—to reduce the health and environmental impacts of hazardous air pollutants. The Agency was under no obligation to ignore the CAA’s purpose in making a final decision on whether to exercise a discretionary authority.

Id.

Here, just as in *United States Sugar Corporation*, EPA exercised discretionary authority in determining how to consider cost under CAA section 112(n)(1)(A), EPA’s consideration of co-benefits does not amount to regulation of PM and SO₂, and nothing in CAA section 112(n)(1)(A)’s text forecloses EPA from considering co-benefits when performing a benefit-cost analysis as one approach to considering cost under that provision. *See* Supplemental Finding, 81 Fed. Reg. at 24,439.

Furthermore, EPA was under no obligation to ignore the very real public health co-benefits that necessarily occur through the regulation of power plants’ hazardous air pollutant emissions, which is consistent with the CAA’s broad purpose to “protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare.” 42 U.S.C. § 7401(b)(1).

Contrary to Petitioners’ argument, nothing in the CAA “limits” EPA to considering benefits related only to hazardous air pollutants in a benefit-cost analysis.

While Congress was certainly focused on the risks associated with hazardous air pollutant emissions when it amended CAA section 112 (that is the point of the section, after all), nothing in the text or history requires a benefit-cost analysis at all, much less precludes EPA, if it chooses to conduct a benefit-cost analysis, from considering the full spectrum of benefits along with the full spectrum of costs for purposes of the appropriate and necessary finding.

Neither the Supreme Court's decision in *Whitman v. American Trucking* nor this Court's decisions in *American Petroleum Institute v. EPA* ("APPI") or *Ethyl Corporation v. EPA* holds to the contrary. In *American Trucking*, the Supreme Court held that the CAA's provision requiring EPA to set primary national ambient air quality standards unambiguously prohibited EPA from considering costs of implementation because, on its face, the provision required EPA to set standards based on public health effects only. 531 U.S. 457, 471 (2001).

As Petitioners point out, the Supreme Court in *Michigan* explained that "*American Trucking* thus establishes the modest principle that where the [CAA] expressly directs EPA to regulate on the basis of a factor that on its face does not include cost, the Act normally should not be read as implicitly allowing the Agency to consider cost anyway." *Michigan*, 135 S. Ct. 2709; Pet. Br. 45. But the Supreme Court in *Michigan* went on to explain that *American Trucking's* principle "has no application" to CAA section 112(n)(1)(A) because the phrase "appropriate and necessary" "is a far more comprehensive criterion" than the section 109 language at issue in *American*

Trucking, Michigan, 135 S. Ct. 2709. Indeed, just as the phrase “appropriate and necessary” is comprehensive enough to include a consideration of cost, so too is it comprehensive enough to allow a consideration of all benefits, including co-benefits, when EPA performs a formal benefit-cost analysis. *See Michigan*, 135 S. Ct. at 2709 (noting that “[o]ther parts of the [CAA] also expressly mention environmental effects, while § 7412(n)(1)(A) does not[,]” but “that did not stop EPA from deeming environmental effects relevant to the appropriateness of regulating power plants”).

In *API*, this Court reviewed EPA’s decision to require renewable oxygenates under the CAA’s reformulated gasoline program. 52 F.3d 1113, 1116 (D.C. Cir. 1995). EPA required that 30 percent of oxygen in reformulated gasoline be derived from renewable sources for various reasons including, *inter alia*, to help conserve fossil fuel resources and to provide global warming benefits. *See id.* The petitioners challenged EPA’s rule, arguing that EPA exceeded its authority by pursuing those goals under the reformulated gasoline program, which was specifically designed to reduce volatile organic compound and toxics emissions. *See id.* This Court agreed with the petitioners and found that the plain language of the relevant statutory provision precluded the adoption of rules not directed toward the reduction of volatile organic compound and toxics emissions. *See id.* at 1120-21.

In *Ethyl Corporation*, this Court reviewed EPA’s denial of a request for a waiver of the CAA’s prohibition on the introduction into commerce of new fuels or fuel additives not substantially similar to existing fuels and fuel additives. 51 F.3d 1053,

1054 (D.C. Cir. 1995). EPA’s rational for the denial was not based on the specific criteria listed under the CAA’s waiver provision, which have to do with the effects on vehicles’ ability to meet emission standards, but rather was based on public health concerns. *Id.* at 1054-55. This Court therefore held that EPA erred in basing its decision on a factor not permitted by the statute. *Id.* at 1058.

Here, EPA is not arguing that a broad grant of statutory authority allows it to regulate pollutants beyond those targeted by the relevant statutory provision (as it did in *API*), nor is EPA relying on a factor other than those specified by Congress when deciding how to regulate (as it did in *Ethyl Corporation*). Instead, EPA is merely determining—in the face of statutory silence on the issue—which costs and benefits are relevant to a benefit-cost analysis for the appropriate and necessary determination under CAA section 112(n)(1)(A). As explained above, EPA’s determination that co-benefits are relevant to a benefit-cost analysis is supported by the statute and legislative history.

2. *EPA’s interpretation is consistent with widely-accepted economic principles contained in executive branch guidance and long-standing agency practice.*

As EPA explained in the Supplemental Finding, “[a] key requirement for conducting a proper benefit-cost analysis is that all known consequences of an action should be considered.” *See* 81 Fed. Reg. at 24,239. “All known consequences” include the full spectrum of economic benefits associated with the action, as well as the full spectrum of costs. Thus, EPA routinely considers “ancillary” consequences,

including ancillary benefits like PM and SO₂ reductions that occur through the regulation of hazardous air pollutants *and* ancillary costs like the costs passed on to electricity consumers and thus not borne directly by the power plant owners regulated by the Standards.¹⁰ This approach is not only consistent with the statute and legislative history, it is also supported by widely-accepted economic principles contained in executive branch guidance documents and long-standing agency practice.

Specifically, EPA's *Guidelines for Preparing Economic Analyses* explain that a benefit-cost analysis "evaluates the favorable effects of policy actions and the associated opportunity costs of those actions." *Guidelines for Preparing Economic Analyses* 1-5 [EPA-HQ-OAR-2009-0234-20503], JA0729. It further states that the foundation of a benefit-cost analysis is to determine whether a policy's net benefits to society are positive. *Id.* at 1-4, JA0728. "Net benefits are derived from summing *all of the benefits* that accrue as a result of a policy change (*including spillover effects*) less costs imposed by the policy on society (*including externalities*)." *Id.* (emphasis added). Moreover, EPA's *Guidelines* state that "[t]he aim of an economic benefits analysis is to estimate the benefits, in monetary terms, of proposed policy changes in order to inform decision making. Estimating benefits in monetary terms allows the . . . calculation of net benefits—the sum of *all monetized benefits* minus the sum of all monetized costs" *Id.* at 7-1 (emphasis added), JA0752. EPA's *Guidelines* also

¹⁰ EPA considered a variety of costs other than those borne directly by regulated plants. *See* Supplemental Finding, 81 Fed. Reg. at 24,434.

state that “[a]n economic analysis of regulatory or policy options should present all identifiable costs and benefits that are incremental to the regulation or policy under consideration. These should include directly intended effects and associated costs, *as well as ancillary (or co-) benefits and costs.*” *Id.* at 11-2, JA0759. Finally, EPA’s Guidelines recognize that “there are often effects that cannot be monetized, and the analysis needs to communicate the full richness of benefit and cost information beyond what can be put in dollar terms.” *Id.* “Benefits and costs that cannot be monetized should, if possible, be quantified Benefits and costs that cannot be quantified should be presented qualitatively” *Id.* Thus, EPA’s *Guidelines* fully support EPA’s choice to include co-benefits in the benefit-cost analysis.

EPA’s Guidelines “are based on a well-developed body of economics literature identifying rigorous methods for conducting benefit-cost analysis, were extensively peer-reviewed by the independent Environmental Economics Advisory Committee, and represent the current consensus of the economics discipline as to the purpose and appropriate practice of benefit-cost analysis.” Supplemental Finding, 81 Fed. Reg. at 24,439; *see also* <https://www.epa.gov/environmental-economics/guidelines-preparing-economic-analyses>.¹¹

¹¹ Petitioners quote the *Guidelines* out of context. *See* Pet. Br. 50-51. The *Guidelines* instruct EPA to take “the current state of relevant economic variables” and the “environmental problem that the regulation addresses” into account when determining the *baseline* to which the proposed action is compared, (footnote cont’d)

Additionally, the Office of Management and Budget's ("OMB") *Circular A-4* was published in 2003 and provides the OMB's guidance to federal agencies on the development of regulatory analyses for purposes of Executive Order 12866 and other related authorities. That document instructs agencies to "look beyond the direct benefits and direct costs of your rulemaking and consider any important ancillary benefits and countervailing risks." See OMB Circular A-4 (Sept. 17, 2003) 26 [EPA-HQ-OAR-2009-0234-20507], JA0771. "An ancillary benefit is a favorable impact of the rule that is typically *unrelated or secondary to the statutory purpose of the rulemaking* (e.g., reduced refinery emissions due to more stringent fuel economy standards for light trucks)[.]" *Id.* Thus, OMB's *Circular A-4* also supports EPA's inclusion of co-benefits in the benefit-cost analysis.

Indeed, consistent with EPA's *Guidelines* and OMB's *Circular A-4*, EPA has long considered indirect benefits when evaluating CAA regulations. See RTC 112, JA1320; see also, e.g., Regulatory Impact Analysis for Petroleum Refineries NESHAP ES-9, 180-187, 60 Fed. Reg. 43,244 (Aug. 18, 1995), Docket No. 1-93-48, JA1966, 1967-1974; Regulatory Impact Analysis for Industrial Boilers and Process Heaters NESHAP 10-1-10-51, 69 Fed. Reg. 55,218 (Sept. 13, 2004), EPA-HQ-OAR-2002-0058, JA2036-2086.

see *Guidelines* 5-2, JA0737, not to exclude ancillary benefits and costs from the ultimate comparison, as the provisions EPA cites make clear.

As EPA explained in the Supplemental Finding, excluding a large positive consequence, such as the health benefits associated with reductions in PM and SO₂, “has no basis in economic principles,” “would result in a benefit-cost analysis that would not be recognizable to most economists,” and “would provide an incorrect conclusion regarding the net impact of [the Standards] on economic efficiency.” 81 Fed. Reg. at 24,440. Indeed, Petitioners do not cite a single source of economic support for their proposed approach of excluding co-benefits. Because EPA’s interpretation of CAA section 112(n)(1)(A) as allowing the consideration of co-benefits in a formal benefit-cost analysis is consistent with the statute, legislative history, and widely-accepted economic principles, EPA’s interpretation must be upheld as reasonable.

B. Petitioners’ Arguments Are Without Merit.

Petitioners’ attack on the benefit-cost approach misconstrues the issue before the Court, the facts, and the scope of EPA’s action. First, the premise of Petitioners’ argument with respect to the benefit-cost analysis is false. Petitioners repeatedly state that EPA is regulating hazardous air pollutants based on emissions of pollutants other than hazardous air pollutants. *See, e.g.*, Pet. Br. 42 (“EPA has no authority to base its decision to regulate [power plants] under 112 on the “co-benefits” of reducing pollutants that are not [hazardous air pollutants.]”); 44 (stating that EPA claims “that 112(n)(1) implicitly allows the Agency to rely on PM_{2.5} co-benefits as the basis for regulating [hazardous air pollutant emissions from power plants]”). But that is not

true. EPA is regulating hazardous air pollutant emissions based on EPA's finding that hazards to public health and the environment remain after implementation of other parts of the CAA and based on its Supplemental Finding that it is appropriate and necessary to regulate these emissions after considering costs and other factors.

Nowhere in the record does EPA dispute that the focus of CAA section 112 is the regulation of hazardous air pollutant emissions. In fact, EPA acknowledged as much numerous times in record. *See, e.g.*, Proposed Rule, 75,041/1 (acknowledging that PM and SO₂ reductions “are not the objective of the [Standards]”); Supplemental Finding, 81 Fed. Reg. at 24,438 (same); Legal Memorandum at 22 (“the key benefit of regulating [hazardous air pollutant] emissions is a reduction in the volume of [hazardous air pollutant] emissions from stationary sources to reduce the inherent risks from such pollutants”). The key issue here is not whether EPA is attempting an end-run around other provisions of the statute, which it is not; rather, the key issue is whether EPA properly considered the monetized co-benefits of reducing PM and SO₂, which necessarily result by controlling hazardous air pollutant emissions, in the benefit-cost approach. As explained above, EPA's interpretation that it is appropriate to do so is reasonable and entitled to deference.

Moreover, Petitioners' attempt to construe EPA's action as an effort to reduce PM emissions beyond what is necessary to attain the national ambient air quality standards (“NAAQS”) under CAA section 109 is without merit. *See* Pet. Br. 51-55. What EPA did in the Supplemental Finding was include, in the calculation of total

benefits associated with the Standards, the benefits of reducing PM that occur as a consequence of regulating hazardous air pollutants. These benefits are real, not illusory as Petitioners contend. The best scientific evidence, confirmed by independent, Congressionally-mandated expert panels, is that there is no threshold level of fine particle pollution below which health risk reductions are not achieved by reducing exposure. *See* RTC 131, JA1339-40.¹² As EPA explained in the Supplemental Finding, “there is no evidence of a PM_{2.5} concentration below which health effects would not occur.” 81 Fed. Reg. at 24,440/2. “[T]he NAAQS are not zero-risk standards.” *Id.* at 24,440/1; *see also* Cato Institute Br. 5-6 (conceding that primary NAAQS are not zero-risk standards).¹³ Thus, implementation of the Standards will result in health benefits associated with reductions in PM over and above the benefits achieved by implementing the NAAQS. *See id.* at 24,440/3. As

¹² *See also* U.S. Environmental Protection Agency, Science Advisory Board, Review of EPA's DRAFT Health Benefits of the Second Section 812 Prospective Study of the Clean Air Act 13, 2010 [EPA-HQ-OAR-2009-0234-20569], JA1181.

¹³ To the extent the Cato Institute *amicus curiae* brief raises the same issues as Petitioners, EPA's Argument addresses that brief. EPA notes, however, that the Cato Institute raises a new argument regarding EPA's risk estimates in other rulemakings. *See* Cato Institute Br. 26-27. This argument is outside the scope of issues raised by the parties to this proceeding (and the scope of the rulemaking at issue), and thus is not properly before the Court. *See Eldred v. Reno*, 239 F.3d 372, 378 (D.C. Cir. 2001) (argument urged by *amicus*, but rejected by actual parties to case, was not properly before the Court).

explained above, EPA's decision to include these real co-benefits in the benefit-cost analysis was reasonable.

Petitioners also misstate the facts by arguing that “[w]hen the inquiry is properly limited to the effects of regulating [hazardous air pollutants], the costs unequivocally outweigh the benefits.” Pet. Br. 42. The record does not support this statement. Instead, as EPA explained in the Proposed Rule, “[i]n the [] RIA, EPA could only quantify and monetize a small subset of the health and environmental benefits attributable to reducing mercury emissions,” which was only the IQ loss among a small subset of recreational fishers. 80 Fed. Reg. at 75,040/2. EPA's independent Science Advisory Board cautioned that IQ loss is not even the most significant health effect of mercury exposure. *See id.* Most health effects could not be quantified due to “significant obstacles to successfully quantifying and monetizing the public health benefits from reducing [hazardous air pollutant] emissions” like “toxicological data, uncertainties in extrapolating results from high-dose animal experiments to estimate human effects at lower doses, limited monitoring data, difficulties in tracking diseases such as cancer that have long latency periods, and insufficient economic research to support the valuation of the health impacts often associated with exposure to individual [hazardous air pollutants].” *Id.* at 75,040 n.53. These “uncertainties” do not reflect any uncertainty with respect to the actual benefits of reducing hazardous air pollutants, as Petitioners contend, *see* Pet. Br. 56; they merely reflect uncertainty with respect to the accuracy of any attempt to *quantify and*

monetize the very real benefits of reducing hazardous air pollutants. *See* Legal Memorandum at 22 (“Unquantifiable benefits . . . are just as real as the targeted benefits that can be monetized.”), JA0040.

Indeed, EPA explained that large categories of benefits could not be quantified and monetized. They include:

- (1) Benefits from reducing adverse health effects on brain and nervous system development beyond IQ loss;
- (2) Benefits for consumers of commercial (store-bought) fish (the largest pathway to mercury exposure in the U.S.);
- (3) Benefits for consumers of self-caught fish from oceans, estuaries or large lakes;
- (4) Benefits for the populations most affected by mercury emissions (e.g. children of women who consume subsistence level amounts of fish during pregnancy);
- (5) Benefits to children exposed to mercury after birth;
- (6) Environmental benefits from reducing adverse effects on birds and mammals that consume fish;
- (7) All benefits associated with reducing non-mercury hazardous air pollutants emissions.

See Supplemental Finding, 81 Fed. Reg. at 24,441/3. Thus, the \$4-6 million that EPA estimated was the monetized value for the small subset of mercury-related benefits

that could be quantified does not even come close to a full accounting of the benefits of the Standards derived from the reductions in hazardous air pollutants alone, much less a full accounting of the total benefits of the Standards. *See* Proposed Rule, 80 Fed. Reg. at 75,040/2. As EPA stated in the Proposed Rule, “it would be unreasonable to draw any conclusions from a comparison of the [monetized] mercury-only benefits to the full costs of [the Standards].” *Id.* at 75,040/3.

Finally, Petitioners misconstrue the scope of the Supplemental Finding by attempting to challenge “the science” behind the conclusions in the benefit-cost analysis. *See* Pet. Br. 56 (arguing that the benefits are speculative and not supported by the scientific literature); 51-55 (arguing that co-benefits “are illusory”); *see also* Cato Institute Br. 9-23 (attempting to re-litigate EPA’s hazard findings). As EPA explained in the Proposed Rule, “the public had ample opportunity to comment on all aspects of the [] RIA, including the benefits analysis, and the EPA responded to all of the significant comments. . . . EPA is not accepting comments on the methods applied in the [] RIA” 80 Fed. Reg. at 75,039/2. Thus, Petitioners’ challenge to the science behind the RIA is beyond the scope of the Supplemental Finding and not subject to challenge here.

III. PETITIONERS’ ARGUMENTS REGARDING REGULATORY ALTERNATIVES AND OTHER COSTS FAIL.

Petitioners’ third argument presents a grab bag of assertions that EPA failed to properly consider certain costs. Petitioners maintain that EPA (1) failed to consider

less costly options for regulating power plants' hazardous air pollutant emissions; (2) ignored the cost of possible future regulation under CAA section 112(f); (3) failed to consider localized impacts; (4) failed to consider the Electric Reliability Council of Texas;¹⁴ and (5) failed to consider the loss of environmental benefits associated with the closure of ARIPPA members' plants. All of these assertions lack merit. *See* Pet. Br. 58-70.

A. EPA Was Not Required to Consider and Reasonably Rejected Proposed Alternatives to Regulation Under CAA Section 112.

1. EPA was not required to consider regulatory alternatives.

Petitioners assert that EPA should have considered, as alternatives to regulation under CAA section 112, regulation under CAA section 111(d) and state regulation under CAA sections 116 and 112(k)(4). Pet. Br. 58-63; *see* 42 U.S.C. §§ 7411, 7416, 7412(k)(4). They suggest that doing so is required in order to comply with CAA section 112(n)(1)(A)'s directive that EPA "develop and describe" "alternative control strategies" in the Utility Study and to avoid conflict with the Acid Rain Program. *See id.* at 58-59. Petitioners contend that other alternatives would avoid the cost of overregulating certain hazardous air pollutants that Petitioners contend pose no risk. *See id.* at 60-61. Petitioners' assertions fail for several reasons.

¹⁴ According to comments submitted by Luminant Generation Company LLC and others, ERCOT is the independent system operator for the majority of Texas. *See* Comments of Luminant 2 [EPA-HQ-OAR-2009-0234-20533], JA0807.

First, as EPA explained in its merits brief defending the Standards, EPA reasonably interpreted the ambiguous language in CAA section 112(n)(1)(A) to include “alternative control strategies” in the Utility Study as a direction to EPA to identify the various types of *control technologies* available to power plants for reducing hazardous air pollutant emissions, not as a mandate to examine different regulatory frameworks than the one Congress actually adopted for hazardous air pollutant emissions. *See* Final Brief of Respondent 54, Case No. 12-1100, ECF No. 1429467; *see also* 65 Fed. Reg. at 79,828; 77 Fed. Reg. at 9331/1; 76 Fed. Reg. at 24,982/2-3, 25,013-17. EPA submitted the Utility Study, identifying control technologies and not regulatory alternatives, to Congress in 1998. As EPA explained in the Supplemental Finding, if Congress believed EPA’s interpretation was in error, it could have requested more information from EPA just as it did when it requested the additional NAS study. *See* 81 Fed. Reg. at 24,448.

Second, there is no requirement in the statute that EPA consider regulatory alternatives that would avoid conflict with the Acid Rain Program. Petitioners’ sole support for their argument is a single statement by one Representative that actually appears to support EPA’s interpretation of the “alternative control strategies” language in CAA section 112(n)(1)(A). *See* 136 Cong. Rec. 35,013 (Oct. 26, 1990) (discussing EPA’s flexibility under the amendments to avoid requiring utilities to install scrubbers, not a requirement that EPA examine other regulatory strategies for addressing hazardous air pollutants), JA1916. In any event, there is no record

evidence that a conflict exists (and Petitioners do not identify one). As EPA explained in the Proposed Rule, the Acid Rain Program is less costly than originally anticipated because fewer sources installed scrubbers than originally projected. Thus, the co-benefits of that Program (reductions of hazardous air pollutant emissions) are lower than was expected, which contributed to EPA's conclusion that power plants are still significant emitters of hazardous air pollutants requiring regulation under section 112. *See* 80 Fed. Reg. at 75,037. And the two programs generally allow for different compliance alternatives aimed at reducing different pollutants.

Third, in *White Stallion*, this Court unanimously upheld EPA's choice to regulate power plants' hazardous air pollutant emissions under CAA section 112, and to regulate hazardous air pollutant emissions as a group rather than based on specific findings of harm associated with emissions of specific hazardous air pollutants. EPA concluded in the Standards that the phrase "under this section" in CAA section 112(n)(1)(A) meant that EPA must regulate power plants under CAA section 112, like all other source categories listed under CAA section 112(c), if EPA determined that doing so was appropriate and necessary. *White Stallion*, 748 F.3d at 1243; 76 Fed. Reg. at 24,992 ("[S]ection 112 is the authority expressly provided to regulate HAP emissions and no other provision provides express authority to regulate hazardous air pollutant emissions from existing stationary sources."). This Court held that "EPA reasonably concluded that the framework set forth in 112(c) and 112(d)—rather than another, hypothetical framework not elaborated in the statute—provided the

appropriate mechanism for regulating [power plants] under 112 after the ‘appropriate and necessary’ determination was made.” *Id.* at 1244.

In *White Stallion*, this Court also upheld EPA’s interpretation of its “authority to promulgate standards for all listed [hazardous air pollutants] emitted by [power plants], not merely for those [hazardous air pollutants] it has expressly determined to cause health or environmental hazards.” *Id.* The Court stated that it “bears emphasis that the plain text of § 112(n)(1)(A) directs the Administrator to ‘regulate electric utility steam generating units’—not to regulate their *emissions*” and held that EPA need not “‘pick and choose’ among [hazardous air pollutants] in order to regulate only those substances it deems most harmful[.]” *Id.* Thus, Petitioners’ assertions that EPA must consider regulatory alternatives in order to avoid regulating certain pollutants that Petitioners erroneously contend pose no health risk have already been rejected by this Court, and that holding was not disturbed by the Supreme Court’s decision in *Michigan*.¹⁵ As explained *supra*, *Michigan* simply held that EPA must consider cost in determining whether it is appropriate and necessary to regulate power plants under CAA section 112. EPA reasonably fulfilled that obligation under both the preferred approach and the alternative benefit-cost approach. Thus, EPA was not required by

¹⁵ Indeed, UARG’s petition for a writ of certiorari requested review of EPA’s determination that hazardous air pollutants could be regulated absent a specific health risk finding, and the Supreme Court declined to grant review of that issue. *See* UARG Petition for Writ of Certiorari, July 24, 2014, [EPA-HQ-OAR-2009-0234-20563], JA1160-61.

the statute or *Michigan* to consider other methods of regulating hazardous air pollutant emissions from power plants.

2. *EPA reasonably rejected Petitioners' suggestions.*

While EPA was not required to consider regulatory alternatives, EPA further explained in response to comments that no commenter identified a clear regulatory alternative framework and the statute does not provide one. Supplemental Finding, 81 Fed. Reg. at 24,447/3. To the extent Petitioners are suggesting that EPA should have revisited the approach taken by EPA when it attempted to de-list power plants as major sources of hazardous air pollutant emissions and promulgated its 2005 Clean Air Mercury Rule to regulate their emissions under CAA section 111(d), *see* Pet. Br. 61, 11-13, that rule was vacated by this Court and subsequently demonstrated in the Standards to be deeply flawed. *See New Jersey v. EPA*, 517 F.3d 574, 578 (D.C. Cir. 2008); 76 Fed. Reg. 25,019-20 (identifying flaws); RTC 19-21, JA1227-1229. Surely, EPA was not required to reconsider a 10-year-old, vacated, and deeply flawed rule in order to satisfy its obligation to consider cost.

EPA also explained that deferring to state regulation would be in conflict with the statute. The statute mandates that EPA consider the potential impact of *CAA requirements* (*i.e.*, federally-imposed requirements) and that EPA regulate power plants' hazardous air pollutant emissions *under section 112* if EPA determines that doing so is appropriate and necessary. *See* Supplemental Finding, 81 Fed. Reg. at 24,447 n.57; RTC 22-24, JA1230-1232. EPA further explained that deferring to state regulation

would not serve Congress’s goal in enacting section 112—prompt, permanent, and ongoing reductions in hazardous air pollutant emissions. *See* RTC 24, JA1232. This is because states may, but are not required to, develop programs to implement section 112 standards, and there is no parallel requirement that states regularly review the adequacy of hazardous air pollutant standards, as there is under the federal program. *See id.*; *see also* 42 U.S.C. § 7412(l). Given the plain language of CAA section 112(n)(1)(A) and its purpose, EPA determined that “[i]t is unreasonable to conclude that Congress would . . . allow the agency to decline to regulate based on the hope that states would regulate [hazardous air pollutant] emissions from [power plants].” *Id.*

EPA’s explanations for rejecting Petitioners’ suggestions distinguish this case from *Int’l Ladies’ Garment Workers’ Union v. Donovan*, 722 F.2d 795 (D.C. Cir. 1983), which Petitioners cite in support of their argument that EPA failed to consider “an important aspect of the problem.” *See* Pet. Br. 63. In that case, “there was little dispute” about the availability of alternatives to the rulemaking at issue and “substantial testimony” to support those alternatives, yet the agency “failed to provide any explanation” for their rejection. 722 F.2d at 816. Here, EPA considered the alternatives (though it was not required to by the statute or *Michigan*) and reasonably rejected them as unworkable under the plain language and purpose of CAA section 112. Accordingly, Petitioners’ argument that EPA failed to properly consider alternatives is without merit.

B. EPA Thoroughly Considered Non-Speculative Costs Raised In Comments.

Petitioners' remaining arguments regarding EPA's purported failure to consider certain costs are also without merit. First, Petitioners' argument that EPA must consider "a *possible* second round of regulation under the 112(f) residual risk review provision" borders on the ridiculous. Pet. Br. 64 (emphasis added). As EPA explained in response to comments, "EPA has not yet conducted a residual risk analysis per section 112(f) because the agency is not required to do so yet." RTC 35, JA1243. The statute requires that such an analysis be conducted within eight years of the promulgation of 112(d) standards. EPA cannot possibly know the outcome of its future residual risk analysis, but EPA could conclude that no tightening of the Standards is required, which would mean that the cost of additional regulation under section 112(f) would be zero dollars. *See* 42 U.S.C. § 7412(f); *see also, e.g.*, 71 Fed. Reg. 17,720 (Apr. 7, 2006) (concluding no additional standards were required under CAA section 112(d)(6) or (f)(2) for Magnetic Tape Manufacturing Operations); 80 Fed. Reg. 56,700 (Sept. 18, 2015) (same for Secondary Aluminum Production). Surely, EPA is not required to consider purely speculative costs of possible future regulation for purposes of satisfying its obligation to consider cost under CAA section 112(n)(1)(A), particularly when such future regulation will include an additional consideration of cost. *See* 42 U.S.C. § 7412(f)(2)(A).

Second, EPA did not fail to consider localized impacts of the Standards. EPA evaluated projected retail price impacts at a regional level. Specifically, EPA explained in the Proposed Rule that four of the thirteen regions for which retail prices were estimated (which encompassed all of the contiguous 48 states) were projected to have higher rate increases than the national average of 3.1 percent. 80 Fed. Reg. at 75,035/1. But EPA also explained that those regions have lower prices than the national average. *Id.* Additionally, EPA concluded that all projected price increases were well-within the range of normal historical fluctuations. *Id.* at 75,035/2; Supplemental Finding, 81 Fed. Reg. at 24,424/3; *see also* RTC 67-68, JA1275-1276.

EPA also ensured the availability of generation capacity in 32 modeling regions for the contiguous United States through use of the Integrated Planning Model, which is “specifically designed to ensure that generation resource availability is maintained.” RTC 77, JA1285. In that study, EPA concluded that “operational capacity is reduced by less than one percent nationwide” under the Standards, that “the reduction will have little overall impact,” and that since “coal retirements are distributed throughout the power grid,” there “will be only small impacts at the regional level.” Resource Adequacy and Reliability in the IPM Projections for the [Standards] 2, [EPA-HQ-OAR-2009-0234-19997], JA0385. Petitioners provided no evidence that the Standards caused local reliability problems, and EPA is not aware of any.

With respect to Petitioners’ claim that EPA failed to look at recent closure data, EPA explained that commenters failed to show that the additional retirements they

cited are attributable to the Standards, that many factors influence decisions to retire coal-fired power plants, and that recent trends in the electric power industry, such as low natural gas prices and slow demand growth, have placed significant economic pressure on coal-fired power plants. *See* Supplemental Finding, 81 Fed. Reg. at 24,433/2-3; RTC 83-84, JA1291-1292. Moreover, EPA defended its reliance on the RIA as the best forecast of costs and impacts available when the Standards were promulgated, which is the point in time when EPA should have considered cost in the appropriate and necessary finding, and is thus the relevant forecast. *See* 81 Fed. Reg. at 24,433/1-2.

Third, EPA did not fail to consider costs to owners, like those in the ERCOT market, who may not be able to pass on costs to consumers. Petitioners wrongly assert that “EPA’s assumption that compliance costs were recoverable was a key part of its (erroneous) conclusion that overall costs were reasonable[.]” Pet. Br. 67. As explained *supra*, EPA’s consideration of rate increases was just one of the three metrics EPA considered in determining that under *each metric* the cost of the Standards is reasonable. *See* Proposed Rule, 80 Fed. Reg. at 75,033-35; Supplemental Finding, 81 Fed. Reg. at 24,424; *see also* RTC 67 (stating that EPA did not assume all costs would be passed on to consumers), JA1275. Indeed, EPA also considered costs as a percentage of sector revenue and capital expenditures. *See* Proposed Rule, 80 Fed. Reg. at 75,033-34; Final Rule, 81 Fed. Reg. at 24,424. Under both of those metrics, without assuming costs would be passed on to consumers, EPA concluded that

compliance costs were reasonable because they represented only a small percentage of revenue and capital expenditures. *See* Proposed Rule, 80 Fed. Reg. at 74,033/3, 74,034/3, 75,035/3.¹⁶

Finally, EPA responded to comments suggesting that ARIPPA's coal-refuse burning members would be forced to shut down due to their inability to comply with the HCl standard, thereby eliminating the environmental benefit those power plants provide. In particular, EPA stated that ARIPPA's claim was not supported by the record, which indicates that coal-refuse fired power plants are "among the best performing sources for all [hazardous air pollutants], including acid gas [hazardous air pollutants]." RTC 195, 200, JA1403, 1408.¹⁷ In other words, ARIPPA's claim of forced closures due to the Standards is belied by the record, and ARIPPA provided

¹⁶ In any event, the analysis submitted by ERCOT itself stated that "the impacts of [the Standards] are unlikely to impact overall trends on the ERCOT system as they are not expected to affect the economics of a significant number of units." RTC 67 n.17 (quoting ERCOT, Impacts of Environmental Regulations in the ERCOT Region at 12 [EPA-HQ-OAR-2009-0234-20569, attachment 55], JA1200).

¹⁷ *See also* Testimony of ARIPPA before the Senate Environmental Resources & Energy Committee on the Coal Refuse to Energy Industry at 5 (Oct. 11, 2016), available at [http://arippa.org/documents/ARIPPA%20Testimony%20-%20Senate%20Environmental%20Resources%20&%20Energy%20Committee%20Hearing%20\(10-11-16\).pdf](http://arippa.org/documents/ARIPPA%20Testimony%20-%20Senate%20Environmental%20Resources%20&%20Energy%20Committee%20Hearing%20(10-11-16).pdf), JA2211 (post-record testimony citing "a stagnant demand for electricity, state and federal pricing subsidies for competing electricity technologies, and a glut of, and abnormally low prices, for natural gas" along with "restrictive regulatory requirements" as challenges for the coal refuse industry).

no evidence to the contrary. *See generally* ARIPPA Comment Letter [EPA-HQ-2009-0234-20535], JA0818-0840.

In summary, EPA thoroughly considered non-speculative costs raised in comments on the Proposed Rule. Accordingly, Petitioners' arguments to the contrary fail.

IV. IF THE COURT FINDS THAT EPA ERRED, THE COURT SHOULD REMAND THE SUPPLEMENTAL FINDING ONLY, LEAVING THE STANDARDS IN EFFECT.

When this Court finds that an agency has erred in promulgating a rule, the Court applies two factors to determine whether the rule should be remanded without vacatur: (1) “the seriousness of the . . . deficiencies (and thus the extent of doubt whether the agency chose correctly),” and (2) “the disruptive consequences of an interim change that may itself be changed.” *Allied Signal, Inc. v. U.S. Nuclear Regulatory Comm’n*, 988 F.2d 146, 150-51 (D.C. Cir. 1993). This Court’s “traditional position” is to remand without vacatur “where vacating would have serious adverse implications for public health and the environment.” *North Carolina v. EPA*, 550 F.3d 1176, 1178 (D.C. Cir. 2008) (Rogers, J., concurring in part). Indeed, citing *Allied Signal*, this Court remanded the Standards without vacatur after *Michigan*, allowing the Standards to remain in effect while EPA considered cost in the Supplemental Finding. If the Court finds that EPA erred in promulgating the Supplemental Finding, which it should not, the Court should follow the same approach here and remand the Supplemental Finding, leaving the Standards in effect.

As explained above and in EPA's briefing of the remedy issue after *Michigan*, the Standards obtain significant public health and environmental benefits, including benefits to states that are relying on emission reductions for other regulatory programs. *See* Respondent's Motion to Govern Future Proceedings 2-4, 12-18, Case No. 12-1100, ECF No. 1574825. And the Standards were already long overdue when promulgated in 2012. *Id.* at 12-13. Moreover, since most sources have already installed the controls necessary for compliance with the Standards, maintaining the status quo would not likely pose significant adverse consequences for industry, and may even avoid disruption to capacity markets. *See id.* 18-20; *see also* EPA's Response to Petitioners' Motion to Govern Future Proceedings 14-15, Case No. 12-1100, ECF No. 157916. Accordingly, any decision by this Court adverse to EPA should leave the Standards in place and remand only the Supplemental Finding.

CONCLUSION

For the foregoing reasons, EPA respectfully requests that the Court deny the petitions for review.

Respectfully Submitted,

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CERTIFICATE OF COMPLIANCE WITH WORD LIMITATIONS

Pursuant to Fed. R. App. P. 32(a)(7)(C), and exclusive of the components of the brief excluded from the word limit pursuant to Fed. R. App. P. 32(a)(7)(B)(iii), I hereby certify that the foregoing brief contains 17,914 words, as counted by the word count feature of Microsoft Word, which is in compliance with Court's Order, ECF No. 1641015.

Dated: March 22, 2017

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CERTIFICATE OF SERVICE

I hereby certify that I served a copy of the FINAL BRIEF OF RESPONDENT via Notice of Docket Activity by the Court's CM/ECF system, on March 22, 2017, on counsel of record.

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