

## **Legal Memorandum Accompanying the Proposed Supplemental Finding that it is Appropriate and Necessary to Regulate Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units (EGUs)**

On April 16, 2012, the Environmental Protection Agency (EPA) reaffirmed its finding that regulation of hazardous air pollutant (HAP) emissions from coal and oil-fired electric generating units (EGUs) is appropriate and necessary and issued the final national emission standards for hazardous air pollutants for such sources pursuant to Clean Air Act section 112(d). 77 Fed. Reg. 9304. These standards are referred to as the Mercury and Air Toxics Standards or MATS. MATS was challenged in the United States Court of Appeals for the District of Columbia Circuit (D.C. Circuit) and all petitions for review were denied. The Supreme Court of the United States (the Court or Supreme Court) then granted petitions for certiorari to review whether the EPA unreasonably refused to consider cost in determining whether it is appropriate to regulate HAP emissions from EGUs. On June 29, 2015, the Court ruled that the EPA did act unreasonably when it determined that cost was irrelevant to the threshold appropriate and necessary finding. *Michigan v. EPA*, 135 S.Ct. 2699; 192 L.Ed.2d 674 (2015). The EPA is publishing a notice that sets forth and requests comment on the proposed supplemental finding that consideration of cost does not alter our previous conclusion that it is appropriate and necessary to regulate (HAP) emissions from coal- and oil-fired electric utility steam generating units (EGUs) under section 112 of the Clean Air Act (CAA). This supporting document provides detailed information on the EPA's interpretation of CAA section 112(n)(1). The proposed supplemental finding, if finalized after consideration of comments, will conclude that coal- and oil-fired EGUs are properly included on the section 112(c) list of sources that must be regulated under CAA section 112(d).

In determining how to incorporate consideration of cost into the appropriate finding, the EPA evaluated the statutory text and context to determine the manner in which cost should be considered under CAA section 112(n)(1) and how best to weigh cost against the advantages of regulation when deciding whether regulation is appropriate. This action focuses on the EPA's consideration of cost under that section and its approach to balancing these considerations against the advantages of addressing previously identified hazards to public health and the environment associated with HAP emissions from EGUs. As such, this action does not disturb EPA's prior interpretations of the phrase "appropriate" and "necessary," except to the extent EPA had interpreted that phrase as allowing EPA to add EGUs to the 112(c) list without taking cost into account. Thus, we are not reopening any aspects of our prior interpretation unrelated to consideration of cost, and we are not reopening any aspects of our findings concerning the identified hazards to public health or the environment that support a conclusion that regulation of HAP emissions from EGUs is appropriate. See Proposed "National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units [MATS] and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional Steam Generating Units [Utility NSPS]", 76 FR 24976, 24986-25020 (May 3, 2011); Final "National Emission Standards for Hazardous Air Pollutants from

Coal- and Oil-Fired Electric Utility Steam Generating Units [MATS] and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional Steam Generating Units [Utility NSPS]”, 77 FR 9304, 9310-9366.<sup>1</sup> The EPA is considering and taking comment only on the EPA’s interpretation of the role of cost in the appropriate finding set forth in this supporting memorandum, and the EPA’s proposed supplemental finding that a consideration of cost does not cause the Agency to alter its conclusion that it is appropriate to regulate HAP emissions from EGUs.

**I. Background – Listing and Regulating Hazardous Air Pollutants from Electric Utility Steam Generating Units (EGUs) under section 112 of the Clean Air Act**

As discussed below, CAA section 112(n)(1)(A) established a unique provision applicable to EGUs requiring the Agency to evaluate the hazards to public health posed by HAP emissions from such sources before listing those sources for regulation under section 112(c). Specifically, section 112(n)(1)(A) requires the Agency to find that regulation of HAP emissions from EGUs is “appropriate and necessary” before listing the source category. To facilitate the EPA’s evaluation of HAP emissions from EGUs, the statute required three studies under section 112(n)(1), titled “Electric utility steam generating units.” Section 112(n)(1)(A) required EPA to conduct a study of the hazards to public health from HAP emissions from EGUs that will remain after imposition of the other provisions of the CAA and determine whether there are controls available to reduce the HAP emissions from EGUs (Utility Study). Section 112(n)(1)(B) required the EPA to study the mercury emissions from EGUs and all other sources of mercury, and to determine the rate and mass of the mercury emissions, the health and environmental effects of such emissions, and the availability and cost of controls to reduce such emissions (Mercury Study). Section 112(n)(1)(C) required the National Institute of Environmental Health Sciences (NIEHS) to conduct a third study related to the threshold level of mercury in fish tissue that can be consumed without adverse effects to public health (NIEHS Study). The Utility Study was required to be completed by November 1993 and the Mercury Study was required to be completed by 1994. In fact, the Mercury Study was completed in 1997, and the Utility Study was completed in 1998. The NIEHS Study was completed in 1995.

On December 20, 2000, after considering the results of the section 112(n)(1) studies and additional information collected after completion of the studies, the EPA issued a “Notice of regulatory finding” that regulation of HAP emissions from coal- and oil-fired EGUs was appropriate and necessary and added such units to the section 112(c) list of sources that must

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<sup>1</sup>Industry, states, environmental organizations, and public health organizations challenged many aspects of EPA’s appropriate and necessary finding and the MATS emissions standards and the D.C. Circuit Court denied all challenges to the CAA section 112(n)(1)(A) appropriate and necessary finding and to the section 112(d) MATS rule, and, with the exception of the cost issue relevant to the section 112(n)(1)(A) finding, all the challenges were unanimously rejected. *White Stallion Energy Center v. EPA*, 748 F.3d 1222 (April 15, 2014) (Judge Kavanaugh dissented solely on the issue of whether EPA was required to consider cost when making the threshold appropriate and necessary finding under section 112(n)(1)(A)).

be regulated pursuant to section 112(d). 65 FR 79825, 79830 (2000 Finding). The Agency concluded it was “appropriate” to regulate HAP emissions from EGUs because the Agency identified hazards to public health and the environment from such emissions and because the EPA determined there were controls available to reduce such HAP emissions. *Id.* The EPA concluded it was “necessary” to regulate HAP emissions from EGUs because imposition of the other provisions of the CAA were not expected to address the identified risks from such emissions and because section 112 is the proper authority to address risks from HAP emissions. *Id.*

Shortly after issuance of the 2000 Finding, an industry group challenged that finding in the U.S. Court of Appeals for the D.C. Circuit (D.C. Circuit). *UARG v. EPA*, 2001 WL 936363, No. 01-1074 (D.C. Cir. July 26, 2001). The D.C. Circuit dismissed the lawsuit holding that it did not have jurisdiction because section 112(e)(4) provides, in pertinent part, that “no action of the Administrator . . . listing a source category or subcategory under subsection (c) of this section shall be a final agency action subject to judicial review, except that any such action may be reviewed under section 7607 of (the CAA) when the Administrator issues emission standards for such pollutant or category.” *Id.* (emphasis added)

In 2005, the EPA issued a final rule that reversed the appropriate and necessary finding, removed EGUs from the section 112 list (2005 Action), and established standards for only mercury emissions pursuant to CAA section 111 (Clean Air Mercury Rule or “CAMR”). Environmental groups, states, and tribes challenged the 2005 Action, and they also challenged CAMR. Among other things, the environmental and state petitioners argued that the EPA could not remove EGUs from the section 112(c) source category list without following the requirements of section 112(c)(9).

On February 8, 2008, the D.C. Circuit Court vacated both the 2005 Action and CAMR. The D.C. Circuit Court held that EPA failed to comply with the requirements of section 112(c)(9) for delisting source categories. Specifically, the D.C. Circuit held that section 112(c)(9) applies to the removal of “any source category” from the section 112(c) list, including EGUs. The D.C. Circuit Court rejected the argument that EPA has the inherent authority to correct its mistakes, finding that, by enacting section 112(c)(9), Congress limited EPA’s discretion to reverse itself and remove source categories from the section 112(c) list. The D.C. Circuit found that EPA’s contrary position would “nullify §112(c)(9) altogether.” *New Jersey v. EPA*, 517 F.3d 574, 583 (D.C. Cir. 2008). The D.C. Circuit did not reach the merits of petitioners’ challenges to CAMR, but vacated CAMR for existing sources because coal-fired EGUs were listed under CAA section 112. The D.C. Circuit reasoned that even under EPA’s own interpretation of the CAA, regulation of existing sources’ mercury emissions under section 111 was prohibited if those sources were a listed source category under section 112.<sup>2</sup> The D.C. Circuit vacated and remanded CAMR for new sources because it concluded that the assumptions the EPA made when issuing CAMR for

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<sup>2</sup> In CAMR and the 2005 Action, EPA interpreted section 111(d) of the Act as prohibiting the Agency from establishing an existing source standard of performance under section 111(d) for any HAP emitted from a particular source category, if the source category is regulated under section 112.

new sources were no longer accurate (i.e., that there would be no section 112 regulation of EGUs and that the section 111 standards would be accompanied by standards for existing sources). *Id.* at 583-84. Thus, CAMR and the 2005 Action reversing the 2000 appropriate and necessary finding became null and void. This meant that EGUs remained on the list of sources that must be regulated pursuant to CAA section 112(d).

On December 18, 2008, several environmental and public health organizations (“Plaintiffs”)<sup>3</sup> filed a complaint in the D.C. District Court (Civ. No. 1:08-cv-02198 (RMC)) alleging that the Agency had failed to perform a nondiscretionary duty under CAA section 304(a)(2), by failing to promulgate final section 112(d) standards for HAP from coal- and oil-fired EGUs by the statutorily-mandated deadline of December 20, 2002 -- 2 years after such sources were listed under section 112(c) as a result of the 2000 finding. The EPA ultimately entered into a consent decree to settle the case. The consent decree, as amended, required the EPA to sign a notice of proposed rulemaking setting forth the EPA’s proposed section 112(d) emission standards for coal- and oil-fired EGUs by March 16, 2011, and to sign a notice of final rulemaking by December 16, 2011.

On February 16, 2012, the EPA reaffirmed the 2000 appropriate and necessary finding pursuant to CAA section 112(n)(1)(A) and issued the final MATS pursuant to CAA section 112(d).<sup>4</sup> 77 Fed. Reg. 9304. Industry, states, environmental organizations, and public health organizations challenged many aspects of EPA’s appropriate and necessary finding and the MATS emissions standards, including: 1) EPA’s reliance on the CAA section 112(c)(9) delisting criteria for determining the level of risk worth regulating; 2) EPA’s decision not to consider cost in making the appropriate and necessary determination and listing of EGUs; 3) EPA’s use of identified environmental harms as a basis for finding it appropriate and necessary to regulate HAP emissions from EGUs; 4) EPA’s consideration of the cumulative impacts of HAP emissions from EGUs and other sources in determining whether EGUs pose a hazard to public health or the environment; 5) EPA’s regulation of EGUs pursuant to CAA section 112(d) after adding EGUs to the section 112(c) list pursuant to the appropriate and necessary finding; 6) EPA’s determination that all HAP from EGUs should be regulated; 7) EPA’s technical basis for concluding that EGUs pose a hazard to public health or the environment; 8) EPA’s determination to regulate all EGUs as defined in CAA section 112(a)(8) in the same manner whether or not the individual units are located at major or area sources of HAP; 9) EPA’s emissions standards for mercury and acid gas HAP, including the EPA’s decision not to set health based emission standards for acid gas HAP; 10) EPA’s use of certified data submitted by regulated parties; 11) EPA’s denial of a delisting petition filed by an industry trade group; 12) EPA’s decision not to subcategorize a certain type of EGU; and 13) EPA’s decision to allow EGU’s

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<sup>3</sup> American Nurses Association, Chesapeake Bay Foundation, Inc., Conservation Law Foundation, Environment America, Environmental Defense Fund, Izaak Walton League of America, Natural Resources Council of Maine, Natural Resources Defense Council, Physicians for Social Responsibility, Sierra Club, The Ohio Environmental Council, and Waterkeeper Alliance, Inc.

<sup>4</sup> The EPA signed the final MATS on December 16, 2011, consistent with the consent decree; however, the final rule was not published in the Federal Register until February 16, 2012.

to average HAP emissions among certain EGUs. The D.C. Circuit denied all challenges to the CAA section 112(n)(1)(A) appropriate and necessary finding and to the section 112(d) MATS rule, and, with the exception of the cost issue relevant to the section 112(n)(1)(A) finding, all the challenges were unanimously rejected. *White Stallion Energy Center v. EPA*, 748 F.3d 1222 (April 15, 2014) (Judge Kavanaugh dissented solely on the issue of whether EPA was required to consider cost when making the threshold appropriate and necessary finding under section 112(n)(1)(A)).

Some industry and state petitioners sought review of the *White Stallion* decision in the Supreme Court. The Court granted review to address one question: whether the EPA unreasonably refused to consider costs in determining whether it is appropriate and necessary to regulate HAP emissions from EGUs. On June 29, 2015, the Supreme Court ruled by a 5-4 vote that EPA acted unreasonably when it determined that cost was irrelevant to the threshold appropriate and necessary finding. *Michigan v. EPA*, 135 S.Ct. 2699; 192 L.Ed.2d 674 (2015). Specifically, in a decision limited exclusively to the “grounds on which EPA acted,” 135 S.Ct. at 2711, the Supreme Court explained that “[r]ead naturally in the present context, the phrase ‘appropriate and necessary’ requires at least some attention to cost,” *id.* at 2707, 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 explained, however, that it was not holding that a particular analysis of costs was required, and that on remand “[i]t [would] be up to the Agency to decide . . . how to account for cost.” *Id.* at 2711. This proposal responds to the Supreme Court’s ruling by adding a consideration of the disadvantages or costs of regulation into EPA’s evaluation of whether it is appropriate to regulate HAP emissions from EGUs.

## **II. The EPA’s Interpretation of CAA section 112(n)(1)(A) in light of *Michigan v. EPA***

In *Michigan*, the Supreme Court held that EPA erred when it concluded that it need not consider cost when determining whether the regulation of HAP emissions from coal- and oil-fired EGUs was appropriate and necessary. Because EPA had adopted this interpretation in the MATS rulemaking, the Agency did not, at that time, evaluate the statute to determine how cost should be considered when determining whether regulation is appropriate. The EPA has now reevaluated its interpretation of CAA Section 112(n)(1) to identify how cost considerations should be incorporated into this threshold listing determination.

In *Michigan*, the Supreme Court applied the familiar *Chevron* standard and determined that the EPA acted “far beyond [reasonable bounds] when it read §7412(n)(1) to mean that it could ignore cost when deciding whether to regulate power plants.” *Michigan*, 135 S.Ct. at 2707. The Court stated that the phrase appropriate and necessary does not always encompass cost, but found that “[r]ead naturally in the present context the phrase ‘appropriate and necessary’ requires at least some attention to cost.” *Id.* Consideration of cost, the Court reasoned “reflects the understanding that reasonable regulation ordinarily requires paying attention to the advantages *and* disadvantages of agency decisions.” *Id.* The Court repeatedly

emphasized the importance of the statutory context in reaching its conclusion. *See id.* at 2708 (“statutory context reinforces the relevance of cost.”); *id.* at 2709 (“read fairly and in context as we have explained the term plainly subsumes consideration of cost”); *id.* at 2709 (“And as we have discussed, context establishes that this expansive standard encompasses cost.”). The Court also noted that the EPA had decided that the appropriate and necessary finding should be understood in light of all three studies required by section 112(n)(1), and emphasized that the study required by 112(n)(1)(B) reflects concern about cost. *Id.* at 2708.

The EPA has reevaluated the statute in light of the Court’s holding in *Michigan*. The EPA considers below the purpose and scope of the 1990 amendments to CAA section 112, including section 112(n)(1), to determine the cost considerations generally relevant to HAP related actions, the benefits of regulating HAP emissions from stationary sources, and a reasonable approach to balancing the costs with the other factors relevant to determining whether regulation of HAP emissions from EGUs is appropriate. *See Lignite Energy Council v. EPA*, 198 F.3d 930, 933 (D.C. Cir. 1999) (discussing scope of agency discretion to balance factors absent specific statutory instruction).

#### **A. Purpose of the 1990 Amendments to CAA section 112**

Congress enacted section 112 to address hazardous air pollutant or “HAP” emissions from stationary sources in 1970. At that time, the CAA required the EPA to identify pollutants that were “hazardous air pollutants” and regulate sources of those identified HAP emissions based solely on the risk to human health. Legislative History of the CAA Amendments of 1990 (“Legislative History”), at 3174-75, 3346 (Comm. Print 1993). Chemical compounds and elements that are known to cause or are suspected of causing cancer, birth defects, reproduction problems, and other serious health effects, often in very small quantities, are considered HAP, and stationary sources emitted millions of pounds of such pollutants into the air each year. Between 1970 and the 1990 CAA amendments, many states listed and regulated hundreds of “HAP.” Conversely, the EPA evaluated and identified very few HAP in that same 20- year’ period. The Agency listed only 8 pollutants, and regulated only a handful of source categories that emit those HAP. Congress was dissatisfied with the slow pace of EPA action listing pollutants as HAP and the risk-based approach to regulation of HAP prior to 1990, and, as a result, substantially amended the CAA in 1990, by listing 189 HAP and setting forth a two-stage approach for regulating those HAP emissions from stationary sources. *See* CAA section 112(b)(1) (initial list of HAP); *see also Sierra Club v. EPA*, 353 F.3d 976, 979 (discussing Congress’s reasons for amending section 112 of the CAA and explaining that “the ineffectiveness of the risk-based approach created a ‘broad consensus that the program to regulate [HAPs] under *section 112 of the Clean Air Act* should be restructured to provide EPA with authority to regulate . . . with *technology-based* standards.”) (citing Legislative History of the CAA Amendments of 1990).

Under the first stage, the statute requires the EPA to list major and area sources of HAP and to promulgate technology-based emission standards for listed source categories on a

prompt schedule. See CAA section 112(c), 42 U.S.C. § 7412(c) (listing of source categories), 42 U.S.C. 7412(d) (emission standards), and CAA section 112(e), 42 U.S.C. § 7412(e) (schedule for standards and review). For all major sources and certain area sources, the EPA must establish maximum achievable control technology or MACT standards after considering the cost of achieving such standards and any non-air-quality health and environmental impacts and energy requirements. See CAA section 112(d)(2), 42 U.S.C. § 7412(d)(2). The statute also establishes minimum stringency levels or “MACT floors” based on the level of control already achieved by other sources in the category. See CAA section 112(d)(3), 42 U.S.C. §§7412(d)(3). MACT standards cannot be less stringent than these “floors.” For existing sources in categories with 30 or more sources, the floor is based on the level of HAP control achieved by the best performing 12 percent of sources in the source category, and, for source categories with fewer than 30 sources, the floor is based on the level of HAP control achieved by the best performing five sources in the category. See CAA section 112(d)(3)(A) and (B), 42 U.S.C. § 7412 (d)(3)(A) and (B), respectively. The 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. Moreover, by focusing on levels actually achieved by existing sources, instead of levels that could theoretically be achieved, the MACT floors themselves reflect a cost consideration.<sup>5</sup>

In the second stage, which occurs “within eight years” of the imposition of the technology-based MACT standards, the EPA must consider whether residual risks remain that warrant more stringent standards to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect. See CAA section 112(f)(2)(A). The statute explicitly incorporates a two-part test used prior to 1990. See CAA 112(f)(2)(B) (preserving a prior interpretation of the section). First, the EPA makes an initial public health finding based on the potential human health risk associated with the remaining HAP emissions from the source category. EPA must determine whether the risk that remains is acceptable, and address all unacceptable risks. Under the approach explicitly preserved in the 1990 CAA amendments, cost is not relevant to the identification of remaining risks or the evaluation of whether those risks are acceptable. In the second part of the test, the EPA further evaluates whether more stringent standards are necessary to provide an ample margin of safety. In other words, once EPA has determined that the health risks are acceptable, it must evaluate what, if anything, must be done to provide an ample margin of safety. The approach adopted in the CAA provides

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<sup>5</sup> The legislative history supports the EPA’s conclusion that MACT floors contain a consideration of cost.

*“The Administrator may take the cost of achieving the maximum emission reduction and any non-air quality health and environmental impacts and energy requirements into account when determining the emissions limitation which is achievable for the sources in the category or subcategory. Cost considerations are reflected in the selection of emissions limitations which have been achieved in practice (rather than those which are merely theoretical) by sources of a similar type or character.”* A Legislative History of the Clean Air Act Amendments of 1990 (CAA Legislative History), Vol 5, pp. 8508 -8509 (CAA Amendments of 1989; p. 168-169; Report of the Committee on Environment and Public Works S. 1630).

that the EPA may consider cost in this ample margin of safety analysis.

In addition to the one time residual risk review, CAA section 112(d)(6) requires the EPA to “review and revise as necessary (taking into account developments in practices, processes, and control technologies) emissions standards promulgated under [section 112(d)] no less often than every eight years.” The EPA takes cost into consideration in addition to the listed factors when determining whether to require additional control of HAP emissions under this provision.

The statute also includes a series of rigorous deadlines for the EPA, including deadlines for listing categories and issuing emission standards for such categories. *See, e.g.*, CAA section 112(e)(1). Thus, in substantially amending CAA section 112 in 1990, Congress sought prompt and permanent reductions of HAP emissions from stationary sources – first through technology-based standards, and then further, as necessary, through risk-based standards designed to protect human health and the environment or technology standards that require ongoing review to determine if there are available cost effective controls to further reduce HAP even absent a finding of risk. In revising section 112, Congress divested the EPA of much of its discretion, requiring the EPA to regulate even many small sources of HAP to accomplish Congress’s goal of reducing HAP emissions. *See, e.g.*, CAA sections 112(c)(1) (requiring listing of major and area sources); 112(c)(3) (listing criteria for area sources); 112(c)(6) (listing criteria for sources of seven specific HAP; 112(c)(2) (requiring all listed sources be subject to regulations established pursuant to section 112(d) on the schedule provided in section 112(e)); *see also National Mining Ass’n v. EPA*, 59 F.3d 1351, 1353 (D.C. Cir. 1995) (explaining that the 1990 amendments to the CAA require, among other things, that “EPA must publish a list of ‘categories and subcategories’ of ‘major sources’ and certain ‘area sources’ that emit these pollutants. For each listed ‘category or subcategory of major sources and area sources’ of hazardous air pollutants, § 112(d) of the Act directs EPA to promulgate emission standards.”) (internal citations omitted). In doing so, Congress ensured that the Agency could not avoid regulating HAP emissions from stationary sources as it had for the first 20 years that HAP regulatory authority existed.

The criteria for regulation differ in CAA section 112 depending on whether the source is a major source or an area source. A “major source” is any stationary source<sup>6</sup> or group of stationary sources at a single location and under common control that emits or has the potential to emit 10 tons or more per year of any HAP or 25 tons or more per year of any combination of HAP. *See* CAA 112(a)(1). An “area source” is any stationary source of HAP that is not a “major source.” *See* CAA 112(a)(2). For major sources, the EPA must list a category under section 112(c)(1) if at least one stationary source in the category meets the definition of a major source. Area sources must be listed if: 1) the EPA determines that the category of area sources presents a threat of adverse effects to human health or the environment that warrants regulation under CAA section 112(c)(3); 2) the category of area sources falls within the purview

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<sup>6</sup> A “stationary source” of HAP is any building, structure, facility or installation that emits or may emit any air pollutant. *See* CAA Section 112(a)(3).



of CAA sections 112(c)(3) and 112(k)(3)(B) (the Urban Area Toxics Source Strategy); or 3) the area source category is necessary to achieve the requirement under 112(c)(6) to regulate pursuant to sections 112(d)(2) or (d)(4) major and area sources representing at least 90 percent of the emissions of seven bioaccumulative and persistent HAP, including mercury.

The purpose of reducing HAP emissions from stationary sources is to reduce the *potential* risks inherent with exposure to the listed pollutants, including reducing the risk of such exposure to the most exposed and most sensitive individuals in the population.<sup>7</sup> It can be difficult to quantify risks to all sensitive populations. In addition, regulations designed to reduce HAP emissions, and thereby reduce the risks associated with exposure to HAP emissions, can be costly. Despite this fact (or perhaps because of this fact), the statute prohibits the EPA from considering cost in listing decisions for major and area sources and prohibits the EPA from removing sources from the section 112 list unless there is low potential risk from the source category without regard of the cost. See CAA section 112(c)(9)(B)(i) (providing standards for removing or delisting source categories from the section 112(c) list). Specifically, among other things, the EPA may not delist a source category if even one source in the category emits HAP at levels that *may* cause a lifetime cancer risk greater than 1 in 1 million to the *person in the population that is most exposed to the HAP from the source category*. See CAA section 112(c)(9)(B). This exacting delisting standard as much as anything demonstrates Congressional intent to establish and maintain regulation of significant sources of HAP emissions in order to reduce the risk of potential harm to the most exposed members of the population, assuming that section 112(d)(3) ensures standards will be technologically feasible and cost reasonable because they are based on the levels of control already achieved by existing sources.

The context provided by CAA section 112 generally demonstrates Congress's focus on

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<sup>7</sup> See e.g., CAA sections 112(b)(2) (requiring EPA to add pollutants to the HAP list if EPA determines the HAP “presents, or may present” adverse human health or adverse environmental effects)(*emphasis added*); 112(b)(3)(B) (requiring EPA to add a pollutant to the list if a petitioner shows that a substance is known to cause or “may reasonably be anticipated to cause adverse effects to human health or adverse environmental effects”) (*emphasis added*); 112(b)(3)(authorizing EPA to delete a substance only on a showing that “the substance may not reasonably be anticipated to cause any adverse effects to human health or adverse environmental effects”) (*emphasis added*); 112(c)(9)(B)(i) (prohibiting EPA from delisting a source category if even one source in the category causes a lifetime cancer risk greater than 1 in 1 million to “the individual in the population who is most exposed to emissions of such pollutants from the source”); 112(c)(9)(B)(i) (prohibiting EPA from delisting a source category unless the Agency determines that the non-cancer causing HAP emitted from the source category do not “exceed a level which is adequate to protect public health with an ample margin of safety and no adverse environmental effect will result from emissions of any source” in the category); section 112(d)(4)(allowing a MACT alternative standard only where a pollutant has an established health threshold and the alternative standard provides an “ample margin of safety” in relation to the health threshold); section 112(f)(2)(requiring EPA to evaluate within 8 years MACT standards to determine whether such standards provide an ample margin of safety to protect public health and to promulgate section 112(f)(2) standards if the MACT standards “do not reduce lifetime excess cancer risks to the individual most exposed to emissions from a sources in the category or subcategory to less than one in one million”.); section 112(n)(1)(C) (requiring a study to determine the level of mercury in fish that can be consumed by even sensitive populations without adverse effect to public health).

the inherent risks posed by HAP emissions. To address those risks, the CAA amendments significantly revised section 112 and required the EPA to regulate HAP emissions from stationary sources on a strict schedule based on the level of control achieved by existing sources to achieve *prompt* and *permanent* reductions in such emissions. *See National Mining Ass'n v. EPA*, 59 F.3d at 1352-53 (discussing the purpose and impact of the 1990 Clean Air Act Amendments to section 112); *see also Cement Kiln Recycling Coalition v. EPA*, 255 F.3d 855, 857-58 (D.C. Cir. 2001); *Sierra Club v. EPA*, 353 F.3d at 978-80; *NRDC v. EPA*, 489 F.3d 1364, 1368-69 (D.C. Cir. 2007); *NRDC v. EPA*, 529 F.3d 1077, 1079-80 (D.C. Cir. 2008).

The 1990 amendments required EPA to apply MACT standards to all major stationary sources (and most area sources that emit certain specific HAP) without any express finding of risk to human health or the environment. *See* 42 U.S.C. 7412(c). This demonstrates that a primary goal of section 112 is to reduce the inherent risk of exposure to such emissions by reducing the volume of HAP emissions entering the air. The requirement to conduct technology reviews of MACT standards every 8 years reinforces that Congress was interested in ongoing reductions of HAP to the extent those reductions can be achieved at a reasonable cost, again without any explicit finding of risk beyond the initial Congressional determination that the pollutant is a HAP warranting regulation. Further, section 112(c)(3) and 112(k)(3)(B) require EPA to identify at least 30 HAP that present the greatest threat to public health in urban areas and establish section 112(d) standards for area sources that account for 90 percent or more of the aggregate emissions of the 30 urban HAP. While this area source listing requirement is based on a determination of the HAP that pose risks in urban areas, the statute does not require the Agency to demonstrate that the identified area source categories, individually or collectively, pose a risk before listing those sources if regulation is necessary to meet the 90 percent requirement. Collectively, these requirements and others demonstrate that Congress placed value on HAP reductions, without a specific determination of risk, because of the inherent risk that such emissions pose. *See also*, e.g., 112(c)(6) (requiring MACT standards for area and major sources comprising at least 90 percent of emissions of 7 bioaccumulative and persistent HAP, including mercury); 112(e) (requiring 112(d) standards on a prompt schedule).

Other subsections of CAA section 112 demonstrate that Congress did not intend for the EPA to consider cost when making risk based determinations. Specifically, section 112 requires certain determinations to be made based on risks to human health and/or the environment posed by HAP emissions. For area sources not listed pursuant to sections 112(c)(6) or 112(k)(3)(B), section 112(c)(3) requires the EPA to list area source categories or facilities that pose a threat of adverse effects to human health or the environment if the threat warrants regulation. Similarly, section 112(b)(2) requires the EPA to list pollutants as HAP if they “present, or may present” a threat to human health or the environment. The delisting provisions in section 112(c)(9) require a finding that HAP from a source category do not pose a risk to human health or the environment before the EPA may remove source categories from the section 112(c) list. Section 112(f)(2) requires the EPA to evaluate risk within 8 years of MACT standards being promulgated for a source category to determine whether additional standards are required. The statute requires the EPA to consider additional standards beyond

the MACT level of control if risks remain. The statute does not require or authorize the EPA to consider cost when making risk based determinations. Instead, under section 112, risk is an independent factor that the Agency must consider when deciding whether to regulate. In addition, the Agency generally has discretion to determine what constitutes an unacceptable risk from HAP emissions, but there are limitations within the statute. See section 112(c)(9) (prohibiting EPA from delisting a source category if even one source in the category emits HAP at levels that “may cause a lifetime risk of cancer greater than one in one million to the individual in the population who is most exposed” to such emissions); see also *White Stallion*, 748 F.3d at 1236 (“EPA reasonably relied on the § 112(c)(9) criteria to inform its interpretation of the undefined statutory term ‘hazard to public health’”). Thus, the EPA concludes that determinations regarding whether HAP emissions from EGUs pose hazards to public health or the environment should be made without consideration of cost, and that cost should be only one of the factors the Agency considers in determining whether regulation of EGUs under section 112 is appropriate.

The EPA’s review of section 112 leads us to conclude that the purpose of the statute is to achieve prompt, permanent and ongoing reductions in HAP emissions from stationary sources to reduce the hazards to public health and the environment inherent in exposure to such emissions, with the goal of limiting the risk to the most exposed and most sensitive members of the population. To accomplish this goal, the statute requires as a starting point uniform levels of control from all sources in the same listed category or subcategory, and ongoing review to determine whether additional reductions can be achieved to further reduce the volume of HAP emissions. Thus, the benefit Congress sought in amending section 112 was permanent and ongoing reductions in the volume of HAP emissions. EGUs emit many HAP that are chemically identical to HAP that are emitted from other stationary sources and thus the risks posed by exposure to such HAP emissions are the same. The general goals of the statute thus are relevant to EPA’s evaluation of specific statutory provisions including the EGU specific requirements in section 112(n)(1). See *New Jersey v. EPA*, 517 F.3d at 582 (rejecting EPA’s argument that section 112(c)(9) does not apply to EGUs, and citing section 112(c)(6) as support for the conclusion that “where Congress wished to exempt EGUs from specific requirements of section 112, it said so explicitly.”).

## **B. Treatment of EGUs under CAA section 112**

Congress set a different path for listing EGUs when it enacted section 112(n)(1)(A).<sup>8</sup> This

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<sup>8</sup> EGUs are the only source category containing major sources of HAP that Congress excused from the automatic listing requirement in CAA section 112(c)(1). EGUs were also excused from the section 112(c)(6) requirement that EPA subject area and major sources that comprise 90 percent of the emissions of mercury and six other bioaccumulative and persistent HAP to section 112(d)(2) or (4) standards, even though Congress was aware that

special listing provision for EGUs was enacted, in large part, because such units were uniquely affected among stationary source categories by the title IV Acid Rain Program (ARP), which was also added in the 1990 CAA amendments. The ARP was designed to reduce the acid rain forming criteria pollutants sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>). The program was projected to be very costly and the pollution control equipment (scrubbers) used to reduce SO<sub>2</sub> emissions was known to reduce acid gas HAP and was expected to have other co-benefits such as reductions in emissions of mercury and other HAP, albeit to unknown degrees.<sup>9</sup> In addition, there was uncertainty about the risk, if any, to public health and the environment associated with HAP emissions from EGUs at the time the statute was amended, and it was believed that the ARP and other CAA requirements might address any such risks.

The specific provision adopted in CAA section 112(n)(1)(A) establishes a specific structure for the EPA to evaluate the hazards to public health posed by HAP emissions from EGUs. The EPA is to evaluate such hazards and the costs of regulation to determine whether to regulate such units under section 112. EPA is to list EGUs for regulation under section 112 only if such a determination is made.<sup>10</sup>

In CAA section 112(n)(1)(A), the EPA is directed to conduct a study to evaluate the hazards to public health reasonably anticipated to occur as the result of HAP emissions from EGUs after imposition of the requirements of the CAA, and to report the results of such study to Congress by November 15, 1993.<sup>11</sup> (“Utility Study”). The Utility Study thus required the EPA to collect the information necessary to evaluate, and to evaluate, whether hazards to public health from EGU HAP emissions exist and, if so, whether those hazards would remain after EPA implemented the ARP under title IV of the CAA and other CAA programs that apply broadly to stationary sources, including EGUs. The provision also required EPA to evaluate alternative control strategies to reduce HAP emissions from EGUs.

The last sentence of section 112(n)(1)(A) provides that EPA shall regulate EGUs under CAA section 112 “if the Administrator finds such regulation is appropriate and necessary, after

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EGUs were one of the largest sources of mercury in 1990. The primary effect of Section 112(c)(6) was to take away EPA’s discretion to establish area source standards pursuant to section 112(d)(5). The exclusion of EGUs from the 90 percent calculation in section 112(c)(6) meant that EPA was required to regulate many more area sources pursuant to section 112(d)(2) with the minimum stringency MACT floor standards than would have been required if EGUs were included in the 90 percent calculation.

<sup>9</sup> Even though the Acid Rain trading program did not require direct control of HAP emissions from EGUs, the controls for SO<sub>2</sub> and to a lesser extent NO<sub>x</sub> had the potential for co-benefit reductions in HAP emissions. In particular, the controls for SO<sub>2</sub> are more effective at removing acid gas HAP than SO<sub>2</sub> so a benefit of using scrubbers to reduce SO<sub>2</sub> from EGUs would be a reduction in the acid gas HAP that make almost all EGUs major sources. In fact, the statutory goals of the ARP were achieved with considerably fewer EGUs installing SO<sub>2</sub> controls such that the reduction of HAP emissions attributable to the ARP was not significant. Absent MATS, all but a handful of coal- and oil-fired power plants are major sources of acid gas HAP (e.g., HCl, HF, HCN, and/or SeO<sub>2</sub>).

<sup>10</sup> “Electric utility steam generating unit” is defined as any “fossil fuel fired combustion unit of more than 25 megawatts (MW) that serves a generator that produces electricity for sale.” See CAA § 112(a)(8).

<sup>11</sup> U.S. EPA. *Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units —Final Report to Congress*. EPA-453/R-98-004a. February 1998.

considering the results of the [Utility Study].” Thus, section 112(n)(1)(A) governs how the Administrator decides whether to list EGUs for regulation under section 112. *See New Jersey*, 517 F.3d at 582; *see also Michigan*, 135 S.Ct. at 2709 (“The question before us, however, is the meaning of the “appropriate and necessary” standard that governs the initial decision to regulate.”). As part of its report, the EPA was also directed to develop and describe alternative control strategies for the HAP emissions which may warrant regulation under section 112, but the statute did not require the EPA to consider, and with the exception of those for control of mercury emissions, the EPA did not consider in the report, the cost of the alternative control strategies.

Section 112(n)(1)(A) required the EPA to conduct the Utility Study within 3 years. But for that requirement, the EPA would not likely have had all of the information necessary to review the hazards to public health from EGU HAP emissions upon which to base a finding. The short time frame for conducting the Utility Study is consistent with the section 112 goal of achieving prompt reductions in HAP emissions from stationary sources because it provides the EPA with the information that is presumably most relevant for making that determination. Furthermore, the statute requires the EPA to regulate EGU HAP emissions under section 112 if the EPA finds that such regulation is appropriate and necessary “after considering the results of the study” required by section 112(n)(1)(A). Though the statute does not place a time limit on the appropriate and necessary finding, the implication is that the Agency will at least consider the study once it is completed to determine if regulation under section 112 is warranted for EGUs.

CAA section 112(n)(1) required EPA to issue a second report, due on November 15, 1994, and directed EPA to “conduct a study of mercury emissions from [EGUs], municipal waste combustion units, and other sources, including area sources.” *See* CAA section 112(n)(1)(B) (the Mercury Study).<sup>12</sup> In conducting the Mercury Study, the statute required the EPA to “consider the rate and mass of emissions, the health and environmental effects of such emissions, technologies which are available to control such emissions, and the *costs of such technologies.*” *Id.* (emphasis added). The EPA completed the Mercury study, addressing all of the referenced source categories including EGUs, in 1997. This mercury-specific provision addresses the concern that existed in 1990 that mercury was a significant problem, not confined to EGUs, but that the EPA did not have a sufficient accounting of mercury emissions from stationary sources. It also addresses the concern that the unique chemical and physical properties of mercury might make its control uncertain and potentially very costly. The requirement to study mercury from all sources, including EGUs and area sources, supports the section 112(c)(6) requirement to regulate major and area sources that account for at least 90 percent of seven bioaccumulative HAP, including mercury. Thus, 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. The study also required an evaluation of the available mercury control technologies

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<sup>12</sup> U.S. EPA. 1997. *Mercury Study Report to Congress. Volumes I-VIII*. EPA-452/R-97-003. December 1997.

and their costs. In 1990, because of the unique chemical and physical properties of mercury (it is the only metal that is a liquid at room temperature), there were questions about the ability of sources to effectively control mercury emissions, the stage of development and commercial availability of these controls, and the costs of those controls.<sup>13</sup>

The last required report under section 112(n)(1) was to be completed by the National Institute of Environmental Health Sciences (NIEHS) and submitted to Congress by November 15, 1993. CAA section 112(n)(1)(C) directed NIEHS to conduct “a study to determine the threshold level of mercury exposure below which adverse human health effects are not expected to occur.” In conducting this study, NIEHS was to determine “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.* NIEHS submitted this Report to Congress in August, 1995.<sup>14</sup> The primary issue to be addressed by this provision was the protection of the most sensitive members of the population from mercury. The study addressed this by identifying the level of exposure that was not expected to cause adverse effects.

In addition, Congress, in conference report language associated with EPA’s fiscal year 1999 appropriations, directed EPA to fund the National Academy of Sciences (NAS) to perform an independent evaluation of the available data related to the health impacts of methylmercury (MeHg) (“Toxicological Effects of Methylmercury,” hereinafter, NAS Study or MeHg Study).<sup>15</sup> H.R. Conf. Rep. No 105-769, at 281-282 (1998). Specifically, NAS was tasked with advising EPA as to the appropriate development of a reference dose (RfD) for MeHg. An RfD is defined as 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. 65 FR 79826. In that same conference report, Congress indicated that EPA should not make the appropriate and necessary regulatory determination required by CAA section 112(n)(1)(A) until EPA had reviewed the results of the NAS Study. *See* H.R. Conf. Rep. No 105-769, at 281-282 (1998).

This context provided by the provisions in CAA section 112(n)(1) further informed our interpretation of the role of cost in making the appropriate determination under section 112(n)(1)(A). The required studies focus on potential hazards to public health and the environment, including the potential hazards to the most sensitive members of the population. The statute also requires the Agency to evaluate available controls technologies, and the cost of mercury controls in section 112(n)(1)(B). Thus, cost is one of the several factors that EPA must

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<sup>13</sup> It is worth noting that, unlike CAA section 112(n)(1)(A), CAA section 112(n)(1)(B) did not direct or authorize the EPA to regulate HAP emissions based only on the Mercury Study, but its inclusion under section 112(n)(1) makes it relevant to the appropriate and necessary finding.

<sup>14</sup> U.S. Department of Health and Human Services, National Institutes of Health. 1995. *Report to Congress on Methylmercury*. Research Triangle Park, NC.

<sup>15</sup> National Research Council. 2000. *Toxicological Effects of Methylmercury*. Committee on the Toxicological Effects of Methylmercury, Board on Environmental Studies and Toxicology, National Research Council.

consider in addition to the other relevant factors identified in the statute when determining whether regulation of HAP emissions from EGUs is appropriate. Further, while cost is certainly an important factor, it is one of several factors that must be considered and section 112(n)(1) does not support a conclusion that cost should be the predominant or overriding factor.

**C. Considering the Costs of Regulating HAP Emissions from EGUs under section 112(n)(1)(A)**

1. *The EPA exercised its discretion to develop a reasonable approach to evaluating cost under CAA section 112(n)(1)(A).*

In light of the statutory ambiguity in CAA section 112(n)(1), EPA has discretion to determine the type of cost considerations to incorporate into its evaluation of whether it is appropriate to regulate HAP emissions from EGUs. The statute is ambiguous in that it does not clarify the manner in which disadvantages or costs are to be considered, or address how the EPA is to balance cost against other relevant factors. In fact, section 112(n)(1) includes only one specific reference to costs, which is the reference to the cost of mercury controls in section 112(n)(1)(B). The EPA thus has discretion, as recognized by the Supreme Court “to decide (as always within the limits of reasonable interpretation) how to account for cost.” *Michigan*, 135 S.Ct. at 2711; *see also Chevron U.S. A. Inc. v. Natural Resources Defense Council, Inc.* 467, U.S. 837 (1984) (directing courts to accept any agency’s reasonable resolution of statutory ambiguities).

To reasonably exercise this discretion, the EPA considered the language and context of CAA section 112(n)(1) as well as the general goals of section 112 of the CAA. The statutory text and context highlight the importance of certain cost considerations, suggesting that they are relevant to the analysis of cost in the threshold determination. The statute expresses concern about the uncertainty regarding whether mercury emissions could be effectively controlled. In addition, the statute requires the EPA to consider alternative controls for all HAP, including mercury, thus indicating that the cost of HAP control generally should be considered in the section 112(n)(1)(A) analysis. The EPA thus pays particular attention to these costs in its analysis.<sup>16</sup>

The explicit reference to the cost of mercury controls in section 112(n)(1)(B) suggests that EPA must consider, as a starting point, the cost of mercury controls in the Mercury Study.

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<sup>16</sup> Section 112(n)(1)(A) requires the EPA to consider the risk from HAP emissions from EGUs after imposition of other CAA programs, most notably the Acid Rain Program (ARP) that is uniquely applicable to EGUs. In 1990, there was significant uncertainty about what EGUs would do to comply with the ARP trading program and what other CAA programs would do to reduce HAP emissions from EGUs and, through those reductions, reduce or eliminate the risks such emissions may pose. The ARP was projected to be expensive based primarily on projections of the use of acid gas scrubbers to comply with the program and the cost of such controls at the time. In fact, far fewer EGUs installed scrubbers than projected, and, thus, the cost of the ARP was considerably lower than projected and potential for significant co-benefit reduction in HAP emissions similarly diminished. These facts are worth noting in light of the connection between the ARP and the inclusion of section 112(n)(1)(A) in the 1990 amendments to the CAA and the considerable projected cost of compliance with the ARP at that time.

*See also Michigan*, 135 S.Ct. at 2708 (explicitly referencing the text of section 112(n)(1)(B)). The statutory provisions requiring a consideration of the cost and availability of mercury controls reflect the fact that mercury is a unique element with complex chemistry and it was uncertain at that time how effectively control technologies that have traditionally been applied at EGUs might reduce mercury emissions. *See generally* Mercury Study. Mercury can be emitted from coal-fired power plants in three different forms, as an elemental vapor ( $\text{Hg}^0$ ), as an oxidized compound in gaseous form (usually mercuric chloride,  $\text{HgCl}_2$ ), and as mercury bound to solid particulates contained in the flue gas ( $\text{Hg}_p$ ). When the 1990 CAA amendments were being developed there was uncertainty as to how well, and with what types of processes or flue gas treatment, all the potential forms of mercury emissions could be effectively controlled, at any cost. The section 112(n)(1)(B) study thus put the EPA on a path to ensure that major and area sources, including EGUs, that are required to control their mercury emissions would be able to comply with the standards established pursuant to section 112(d)(2). *See* CAA section 112(c)(6)(requiring major and area sources representing at least 90 percent of mercury and other identified HAP are subject to section 112(d)(2) or (4) standards). EGUs were known to be a significant source of mercury emissions, so the effectiveness and cost of mercury controls would certainly be relevant to the cost of any eventual section 112(d) standards applicable to EGUs, and the potential cost was not known at the time the statute was amended.

The statute also directs the EPA to collect additional information potentially relevant to the costs of regulating HAP emissions from EGUs. For example, as part of the study required by section 112(n)(1)(A), EPA was to consider the alternative control strategies for reducing HAP emissions from EGUs. The statute did not specifically instruct EPA to evaluate the cost of those controls, but instead directed the EPA to “develop and describe . . . alternative control strategies for emissions which may warrant regulation under this section.”<sup>17</sup> Congress’ attention to the cost of mercury controls alone can perhaps be explained by the fact that, at that time, there were known and effective control technologies available for the non-mercury HAP metals, the HAP acid gases, and the organic HAP emitted from EGUs (and other major stationary sources), and the cost of those controls were also well known. The non-mercury HAP metals can be effectively controlled using conventional technologies for control of particulate matter (electrostatic precipitators and fabric filters) and the HAP acid gases can be effectively controlled using conventional flue gas desulfurization (FGD) technologies as  $\text{SO}_2$  is also an acidic

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<sup>17</sup> In the Utility Study, the EPA stated that “[s]ection 112(n)(1)(A) does not include a requirement to analyze the cost(s) of alternative control strategies in the study. Therefore, no cost analyses . . . have been performed as a part of this study. These analyses would be conducted as part of the rulemaking process should EPA determine that regulations are appropriate and necessary.” Utility Study, p. 1-1.



gas.<sup>18</sup> Organic HAP are generally controlled by maintaining efficient combustion conditions. Also at the time, emissions testing programs aimed at evaluating how traditional controls could be combined with each other and with other HAP reduction methods (e.g., sorbent injection) to effectively control HAP at a reduced cost were underway.<sup>19</sup>

Moreover, a key objective of CAA section 112 is to achieve prompt, permanent and ongoing reductions in HAP emissions from stationary sources to reduce the hazards to public health and the environment inherent in exposure to such emissions, with the goal of limiting the risk to the most exposed and most sensitive members of the population. To accomplish this goal, the statute requires as a starting point uniform levels of control from all sources in the same listed category or subcategory, and ongoing review to determine whether additional reductions can be achieved to further reduce the volume of HAP emissions. Thus, the benefit Congress sought in amending section 112 was permanent and ongoing reductions in the volume of HAP emissions. EGUs emit HAP that are chemically identical to HAP from other stationary sources and the general goals of the statute are relevant when determining how to consider cost in the threshold appropriate determination. *See New Jersey v. EPA*, 517 F.3d at 582 (rejecting EPA's argument that section 112(c)(9) does not apply to EGUs, the D.C. Circuit cited section 112(c)(6) as support for its conclusion that "where Congress wished to exempt EGUs from specific requirements of section 112, it said so explicitly."). To give effect to the goal of obtaining prompt reductions in HAP emission, it is reasonable to conclude that section 112(n)(1) required the Agency to collect the information most relevant to the appropriate and necessary determination. Based in part on information collected in these studies concerning the cost and control effectiveness of existing pollution control devices and available information on the application and cost of newer technologies to EGUs, and considering the rapid pace of control technology testing and development, the Agency could have evaluated, at the time of listing, the general ability of EGUs to afford to comply with section 112(d) standards.

The EPA also obtained significant additional relevant information during the course of the MATS rulemaking. In that rulemaking, the EPA both reaffirmed its finding that regulating

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<sup>18</sup> The ARP was established as part of the 1990 CAA Amendments, and acid gas controls, mainly scrubbers, were an integral part of the assumed compliance approach for that program. Approximately 45 percent of SO<sub>2</sub> emissions reductions in 1995 came from SO<sub>2</sub> scrubbing, with the remaining reductions coming from switching to other fuels, such as low-sulfur coal. About half as many scrubbers as were originally anticipated were installed during Phase I of the ARP. By 2001, during Phase II, 37 percent of emission reductions were due to SO<sub>2</sub> scrubbers. All told, the ARP led to the installation of 30 new SO<sub>2</sub> scrubbers on the over 1000 EGUs subject to the program. *See Ellerman AD. 2003. Ex post evaluation of tradable permits: the US SO<sub>2</sub> cap-and-trade program.* Working Paper, Massachusetts Institute of Technology, MIT/CEEPR 03-003; *See also, Economics of Pollution Trading for SO<sub>2</sub> and NO<sub>x</sub>*, Dallas Burtraw, David A. Evans, Alan Krupnick, Karen Palmer, and Russell Toth. <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-05-05.pdf>

<sup>19</sup> The EPA had far more information concerning EGUs than it would have had for other HAP source categories at the time of listing because of the section 112(n)(1) studies. Even that information, however extensive, would not have been sufficient to project specific impacts of an eventual rule given the uncertainty about eventual control configurations that sources might employ to comply with a section 112(d) standard.

HAP emissions from EGUs was appropriate and necessary and developed final emission standards for the source category. The information on the costs associated with regulating HAP emissions from EGUs is presented in the final Regulatory Impact Analysis (RIA) for the final MATS rule. EPA believes it is reasonable to consider this cost information, and has considered this cost information in developing the proposed supplemental finding.

The statutory structure also led EPA to conclude that it is most reasonable to consider the disadvantages of regulating HAP emissions from EGUs collectively. Because section 112(n)(1) is a listing provision, EPA's task is to consider the advantages and disadvantages of regulating the source category under section 112 in a holistic fashion. *White Stallion*, 748 F.3d at 1244 (In affirming the EPA's determination that all HAP from EGUs should be regulated, the D.C. Circuit stated that "[i]t also bears emphasis that the plain text of § 112(n)(1)(A) direct the Administrator to 'regulate electric utility steam generating units' – not regulate their *emissions* as petitioners suggest."). As the D.C. Circuit has confirmed, once EPA determines that it is appropriate and necessary to add EGUs to the section 112(c) list, HAP emissions from the source category must be regulated under section 112(d) unless the EPA removes such units from the list pursuant to section 112(c)(9). *New Jersey v. EPA*, 517 F.3d at 582-83. The statute itself provides the framework for regulation of HAP emissions that must be applied if the EPA determines EGUs should be added to the section 112(c) list. Therefore, once EGUs are added to the section 112 list, the EPA regulates EGUs in the same manner as other sources. Thus, the EPA is not required and it would make little sense within the context of the statute, at the threshold listing stage, to try to ascertain the monetized benefits of regulating each individual HAP so that a comparison could be made to the cost of regulation. Such an approach would not comport with the general statutory structure. Instead, the EPA must determine *whether* the collective HAP emissions from EGUs should be regulated, not the manner in which they should be regulated, and the EPA cannot credibly monetize benefits until the level of the standards are determined consistent with the statutory provisions governing development of section 112(d)(2) MACT standards. Thus, the regulation of and reduction in the significant amounts of HAP emissions from EGUs, and the presumed reduction in risk attendant to such reductions, is the benefit that must and should be evaluated at the listing phase.

2. *The EPA has discretion to develop an approach to evaluating the reasonableness of the costs of regulation and balancing advantages and disadvantages of regulating HAP emissions from EGUs under CAA section 112.*

Absent direct statutory guidance regarding the weight to be given to cost considerations under CAA section 112(n)(1) or how such considerations are to be balanced against the advantages of regulation, EPA has discretion to determine how to balance considerations in light of the statutory objectives. See *Lignite Energy Council v. EPA*, 198 F.3d 930, 933 (D.C. Cir. 1999) (discussing agency discretion to balance factors in the face of statutory silence on the issue). In light of the ambiguity in CAA section 112(n)(1), EPA looked to case law discussing cost-determination under other CAA provisions. Specifically, the EPA considered case law

evaluating EPA's establishment of standards under CAA section 111(a)(1) for new stationary sources. Under that provision, the EPA is required to take into account "the cost of achieving" the required emission reductions, along with other factors, such as energy requirements, but the statute does not provide specific direction regarding what weight to give costs in comparison with the other factors, or the metric or metrics to use in considering costs. The D.C. Circuit has confirmed that section 111(a)(1) thus confers considerable discretion on the EPA to determine whether costs are acceptable and that the goals of the CAA are relevant to this analysis. The D.C. Circuit has formulated the cost standard in various ways, stating that the EPA may not adopt a standard the cost of which would be "exorbitant,"<sup>20</sup> "excessive,"<sup>21</sup> or "unreasonable."<sup>22</sup> The D.C. Circuit has also held that the EPA has considerable discretion to determine how much weight to give costs.<sup>23</sup> Essentially, the D.C. Circuit has held that CAA section 111 requires EPA to consider whether the standards are reasonable for the industry as a whole to bear. *See Portland Cement Ass'n v. Train*, 513 F.2d 506 (D.C. Cir. 1975) (considering whether industry has shown an inability to adjust in a healthy fashion).

The EPA has similar discretion under CAA section 112(n)(1)(A) in light of the section's silence regarding the weight to be given to the relevant factors in determining whether it is "appropriate" to regulate HAP emissions from EGUs. Moreover, section 112(d) sets a specific minimum level of control for HAP which is based on what has already been achieved by similar sources in the source category. By establishing this requirement, Congress in essence determined that this level of control is per se reasonable. The EPA thus concludes that, when balancing the disadvantages or costs of regulation against the benefits of addressing the identified risks, it is important to consider whether the power sector can reasonably absorb the compliance costs associated with the MACT standards. The EPA believes that for EGUs it may evaluate the industry's ability to afford compliance with MATS in part by determining the

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<sup>20</sup> *Lignite Energy Council v. EPA*, 198 F.3d 930, 933 (D.C. Cir. 1999).

<sup>21</sup> *Sierra Club v. Costle*, 657 F.2d 298, 343 (D.C. Cir. 1981).

<sup>22</sup> *Sierra Club v. Costle*, 657 F.2d 298, 343 (D.C. Cir. 1981).

<sup>23</sup> *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"); *New York v. Reilly*, 969 F.2d 1147, 1150 (D.C. Cir. 1992) ("Because Congress did not assign the specific weight the Administrator should accord each of these factors, the Administrator is free to exercise his discretion in this area."); *see also NRDC v. EPA*, 25 F.3d 1063, 1071 (D.C. Cir. 1994) (EPA did not err in its final balancing because "neither RCRA nor EPA's regulations purports to assign any particular weight to the factors listed in subsection (a)(3). That being the case, the Administrator was free to emphasize or deemphasize particular factors, constrained only by the requirements of reasoned agency decisionmaking."). In addition, in upholding the EPA's consideration of costs under other provisions requiring consideration of cost, courts have also noted the substantial discretion delegated to the EPA to weigh cost considerations with other factors. *Chemical Mfr's Ass'n v. EPA*, 870 F.2d 177, 251 (5th Cir. 1989); *Am. Iron & Steel Inst. v. EPA*, 526 F.2d 1027, 1054 (3d Cir. 1975); *Ass'n of Pacific Fisheries v. EPA*, 615 F.2d 794, 808 (9th Cir. 1980).

impact of such standards on the industry's ability to perform its primary and unique function – that is, the generation, transmission, and distribution of affordable and reliable electricity.<sup>24</sup>

Finally, the EPA also concludes that it is reasonable for the Agency to consider the objectives of section 112 in deciding how to balance the advantages and disadvantages of regulation. Section 112 is based on a determination that HAP emissions are inherently harmful and instructs the EPA to protect the most sensitive populations from those harms. The EPA already identified significant health and environmental hazards associated with EGU HAP emissions and is not reopening those analyses. The task the EPA now faces is to determine whether the disadvantages of regulation, most importantly the cost of compliance, make it inappropriate for the EPA to address those HAP related hazards by regulating HAP emissions from EGUs. Cost is one of several factors that the EPA must balance when making this determination, and section 112 does not support a conclusion that cost should predominate or trump other considerations. *Michigan*, 192 L.Ed. 2d at 682-3 (stating that “reasonable regulation ordinarily requires paying attention to the advantages *and* the disadvantages of agency decisions”).

### 3. *Role of Benefit-cost Analysis for MATS in Light of the Michigan Decision*

Neither the Clean Air Act nor the Supreme Court decision require the EPA to conduct a formal benefit-cost analysis to evaluate whether regulation is appropriate under section 112(n)(1)(A). As explained below, the Supreme Court explicitly declined to require a formal benefit-cost analysis and both the statutory text and the context of 112(n)(1) support EPA's conclusion that benefit-cost analyses in which benefits are assigned a monetary value and compared with the costs of regulation are not required. However, even if such an analysis were to be deemed required, the benefit-cost analysis in the RIA for the final MATS demonstrates that the benefits of MATS far exceed the costs. The RIA for MATS appropriately considers the unquantifiable benefits of the rule and the benefits of the rule that could be quantified and monetized, and it independently supports EPA's proposed supplemental determination that regulation of EGUs under CAA section 112 is appropriate.

EPA's analysis of the cost requirement in 112(n)(1)(A) begins with the *Michigan* decision. In *Michigan*, the Supreme Court states:

Our reasoning so far establishes that it was unreasonable for the EPA to read § 7412(n)(1)(A) to mean that cost are irrelevant to the initial decision to regulate power plants. The Agency must consider cost – including, most importantly, cost of compliance – before deciding whether regulation is appropriate and necessary. We 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

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<sup>24</sup> In section IV.B of the proposed supplemental finding, the EPA discusses both the direct impact of MATS on the utility industry and the indirect effect of MATS on electricity prices and reliability.

each advantage and disadvantage is assigned a monetary value. It will be up to the Agency to decide (as always, within the limits of reasonable interpretation) how to account for cost.

*Michigan*, 135 S.Ct. at 2711.

The Court thus not only left it up to the agency to decide how to account for cost but also explicitly declined to hold that a formal cost-benefit analysis is required as part of a section 112(n)(1)(A) analysis.

The statutory text of section 112(n)(1) similarly does not require a cost-benefit analysis. The statutory text of section 112(n)(1)(A) itself does not speak directly to the methodology to be used to evaluate cost when determining whether regulation is appropriate. The EPA thus also considered the statutory context of section 112(n)(1)(A) and other factors to evaluate whether section 112(n)(1)(A) should be read to require benefit-cost analyses in which costs and benefits are monetized and compared to support a threshold determination. No provision of section 112 requires a benefit-cost analysis to support a HAP related determination. In the 1990 amendments, Congress did not require benefit-cost analyses at any stage of the rulemaking process, but instead emphasized the importance of prompt and permanent reductions in HAP emissions. Congress also took steps, as explained in Section III below, to ensure that the standard setting process incorporated into section 112 ensures that MACT floors are based on emission levels actually achieved by existing similar sources in the same category or subcategory, and ensures that the Agency has sufficient flexibility to further minimize the cost of standards without jeopardizing the goals of the statute. In sum, section 112 does not support a conclusion that the preferred approach to considering cost is the use of benefit-cost analysis for any HAP-related inquiry, much less that the EPA must conduct or rely on such an analysis to support the appropriate and necessary finding.

The first and most obvious contextual consideration that supports EPA's conclusion that a benefit-cost analysis is not required under 112(n)(1) is timing. The EPA's task under section 112(n)(1)(A) is to determine whether it is appropriate and necessary to regulate HAP emissions from EGUs under section 112 of the CAA. An affirmative decision results in the placement of EGUs on the section 112 list, which then leads to development of emission standards under 112(d) of the Act. *See New Jersey v. EPA*, 517 F.3d at 582 (Stating that "[s]ection 112(n)(1) governs how the Administrator decides whether to list EGUs . . ."). The statute requires section 112(d) standards be promulgated within two years of a listing decision. *See CAA* section 112(c)(5). The determination regarding whether regulation is "appropriate and necessary" thus is by design made before any regulatory determinations are made or standards set. As such, the EPA would not have been able to provide credible monetary estimates of the benefits of

the eventual rule at the time the Agency made the threshold finding.<sup>25</sup> For all these reasons, and because other cost metrics could more reasonably be considered, the EPA concludes that the statute does not require a benefit-cost analysis where the costs are compared to the monetized benefits to support the appropriate and necessary finding. *See Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208, 217-218 (2009) (recognizing that there are a variety of reasonable methods to consider cost in making regulatory decisions).

Even if the statute were to be read as requiring a benefit-cost analysis to support the appropriate finding, a contention we reject, all of the benefits identified in the RIA should be considered in any such analysis. Consistent with standard practice, the RIA for MATS considers the quantifiable and non-quantifiable benefits that flow from the rule, including benefits gained through co-benefit reductions in non-target pollutants.<sup>26</sup> Unquantifiable benefits, and benefits associated with concomitant reductions in pollutants other than the targeted pollutants, are just as real as the targeted benefits that can be monetized. In addition, as discussed above, the key benefit of regulating HAP emissions is a reduction in the volume of HAP emissions from stationary sources to reduce the inherent risks from such pollutants. As explained in the MATS cost notice, the EPA's approach to considering benefits for MATS is consistent with the statutory requirements, consistent with the EPA's approach to considering the costs and benefits of the regulations, and consistent with longstanding guidance from the Office of Management and Budget based on standard economic principles.

First, nothing in the statute or legislative history suggests that EPA should ignore benefits unless they can be monetized. As noted above, the statutory text of section 112(n)(1)(A) provides no guidance regarding the methodology to be used for evaluating the cost for the threshold finding. Thus, even if the statute was interpreted to require a benefit-cost analysis to support the appropriate finding, there would be no basis for concluding that the EPA is required to consider only monetized HAP-related benefits. Section 112 of the CAA focuses on the prompt and permanent reductions in HAP emissions to reduce the risks of such

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<sup>25</sup> The EPA estimates monetized benefits of regulations based in large part on the stringency of the proposed and final standards, and, as stated above and in the Federal Register notice, cost estimates conducted at the time of listing would have been highly speculative. For this reason, estimations of the monetized benefits would have been even more difficult to ascertain than estimates of potential costs at the time of listing.

<sup>26</sup> *See* Office of Management and Budget. 2003. Circular A-4: Regulatory Analysis, pg. 26. Washington, DC. Available at: <http://www.whitehouse.gov/omb/circulars/a004/a-4.html> ("Your analysis should look beyond the direct benefits and direct costs of your rulemaking and consider any important ancillary benefits and countervailing risks. An ancillary benefit is a favorable impact of the rule that is typically unrelated or secondary to the statutory purpose of the rulemaking."); *see also* U.S. EPA. 2010. EPA Guidelines for Preparing Economic Analyses, pp. 11-12. Washington, DC. Available at: <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html> ("An 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.").

emissions, including the risk to the most exposed and most sensitive members of the population. Given the statutory focus on reducing risk, and EPA's prior identification, in separate actions, of significant risks to public health and the environment associated with HAP emissions from EGUs, there is no statutory basis for concluding that reductions in risk are irrelevant unless the specific HAP-related benefits can be monetized.

In fact, the statutory provisions argue strongly against reading section 112(n)(1)(A) as requiring a comparison of monetized HAP-specific benefits to costs. The statute on its face is designed to protect the most exposed and most sensitive populations from HAP emissions. See *e.g.*, CAA section 112(c)(9)(B)(i) (prohibiting EPA from removing a source category from the section 112 list if even one facility in the category poses a lifetime cancer risk greater than one in one million to the most exposed person); and CAA section 112(n)(1)(C) (requiring the NIEHS to determine the threshold level for mercury below which adverse human health effects are not expected to occur even among sensitive populations). The most exposed and most sensitive members of a population are almost by definition a small portion of the total population and for that reason quantifiable HAP specific benefits are difficult to estimate and potentially small in dollar terms compared to total cost.

In addition, the EPA considered the context of CAA section 112 to determine whether there was any indication that HAP-specific benefits must be monetized to justify listing a source category. The Agency found no provision of section 112 that requires EPA to quantify or monetize benefits attributable to reductions in HAP or provides a methodology for doing so, including the provisions of section 112(n)(1), wherein Congress required three detailed studies related to EGUs. In addition, we have reviewed the legislative history of CAA section 112 and we could find no indication therein that Congress intended to require EPA to quantify monetarily HAP reductions at any time while implementing the provisions of section 112, much less a requirement that EPA quantify HAP specific benefits to justify a listing decision.

Moreover, the section particular to EGUs, section 112(n)(1), focuses not on developing methodologies for monetizing benefits, but instead on identifying risk and, to a lesser extent, control technologies to reduce identified risks.<sup>27</sup> As discussed above, section 112(n)(1) requires three significant studies related to EGUs for EPA to consider in making the appropriate and necessary finding. None of the section 112(n)(1) studies required EPA to develop a mechanism to quantify benefits of HAP emissions reductions, much less actually quantify those benefits to support the appropriate and necessary finding and justify regulation of HAP emissions from EGUs. After completion of the studies, Congress in the conference report for EPA's fiscal year 1999 appropriations act directed EPA to fund an additional mercury health study similar to the study in section 112(n)(1)(C) before making the appropriate and necessary

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<sup>27</sup> The requirement to evaluate risk from EGUs is noteworthy because the 1990 amendments were made in large part because the risk-based approach in effect prior to that time was failing to reduce the inherent risks from HAP, i.e. the EPA was having difficulty identifying risks and establishing standards based on the identified risk. Monetized benefits are at least two steps removed from risk identification, thus they are even more difficult to assess than risk.

finding. Notably all three section 112(n)(1) studies had already been submitted to Congress by this time, none quantified HAP-specific benefits or developed a mechanism to quantify such benefits, and Congress did not request or require EPA to develop a mechanism to quantify HAP-specific benefits and consider such benefits before making the appropriate and necessary finding. Neither section 112 nor section 112(n)(1) expressly require EPA to monetize benefits or provide the tools to quantify and monetize benefits attributable to reductions in HAP emissions from EGUs. Thus, it is reasonable to conclude that the statute does not require such consideration to support the appropriate finding. In fact, given the known limitations on the Agency's ability to monetize HAP-specific benefits and the lack of statutory direction to address those limitations, it would likely be unreasonable to interpret the statute to authorize the Agency to decline to regulate HAP emissions from EGUs based on a comparison of costs to any HAP specific benefits that could be monetized. Such an interpretation would be particularly unreasonable where, as is the case here, the Agency has found that HAP emissions from EGUs pose a hazard to public health and the environment that will not be addressed through implementation of other CAA provisions.

Second, nothing in the statute suggests that benefits associated with pollutants other than the targeted pollutants are irrelevant to a benefit-cost analysis or must be ignored by EPA. Instead, the statute reasonably allows the EPA to consider quantifiable co-benefits that are a direct result of regulation of HAP emissions from EGUs in a benefit-cost analysis.

Regulation of a particular pollutant often necessarily results in reductions of other non-target pollutants. Reductions of the non-target pollutants are often referred to as ancillary reductions and the associated benefits referred to as co-benefits. These reductions and benefits, however, are a direct result of the regulation of the target pollutant. For example, and in the case of MATS and other section 112 rules, the requirement to reduce metallic HAP emissions necessarily results in reductions of PM<sub>2.5</sub> because the controls for particulate metal HAP indiscriminately reduce emissions of particulate matter without regard to whether the particulate matter is composed of hazardous or non-hazardous pollutants. In fact, the relationship between particulate HAP and particulate matter is so direct that EPA used filterable PM as a surrogate for all non-mercury metal HAP. In addition, while acid gas HAP are not part of SO<sub>2</sub>, the controls required to reduce acid gas HAP also reduce SO<sub>2</sub>, and the EPA established SO<sub>2</sub> as a surrogate for all acid gas HAP, for those sources that control SO<sub>2</sub> with a control device rather than through fuel switching. Thus, when sources comply with one of these surrogate standards, the reductions in PM<sub>2.5</sub> and SO<sub>2</sub> can be considered direct benefits of the MATS rule even though they are not the targeted pollutants. No party challenged EPA's surrogate standards in the D.C. Circuit and the Agency is able to provide monetized benefits estimates attributable to the reductions in PM<sub>2.5</sub> and SO<sub>2</sub>.

Furthermore, section 112(n)(1)(A) itself supports the inclusion of co-benefits if the statute is interpreted to require a benefit-cost analysis to support the appropriate finding. In that provision, the statute directs EPA to perform a study of the hazards to public health from HAP emissions from EGUs that are likely to remain after imposition of the other provisions of



the CAA. The statute requires EPA to determine whether compliance with the Acid Rain Program and other criteria pollutant standards would address the hazards posed by HAP emissions from EGUs. In essence, Congress directed EPA to determine the co-benefit HAP (i.e. non-target pollutants) reductions attributable to the regulation of the criteria pollutants under the Acid Rain Program and other CAA programs. It is reasonable to conclude that the statute allows EPA to consider criteria pollutant reductions attributable to HAP regulations when estimating the benefits of section 112 standards for EGUs since the statute required EPA to consider HAP reductions attributable to criteria pollutant standards when evaluating the hazards to public health from EGUs pursuant to section 112(n)(1)(A).<sup>28</sup>

For all these reasons, the statutory text of section 112 as well as the legislative history supports EPA's decision to follow its longstanding practice of considering both unquantifiable benefits and co-benefits associated with reductions in non-target pollutants when comparing the benefits of the MATS rule to its cost.

#### **D. Conclusion.**

The EPA interprets the statute to convey the Agency with discretion to identify the manner in which cost should be considered under CAA section 112(n)(1)(A). In light of the statutory silence on how to consider cost or how to balance cost against other factors, the EPA has significant discretion to develop reasonable approaches to considering cost, taking into account the goals of the statute. In addition, because section 112(n)(1)(A) is a listing provision, the focus of the evaluation under this section is on determining *whether* HAP emissions from EGUs warrant regulation under section 112, and not on the specific manner of regulation. Under the statutory structure, this listing decision is to be made significantly before the 112(d) standards would be promulgated and it is reasonable for the EPA to consider the types of cost information that would be available at that threshold stage.

Cost is but one of several factors the EPA must consider before it may add, pursuant to CAA section 112(n)(1)(A), EGUs to the list of source categories to be regulated under section 112. If the Agency determines that hazards to human health or the environment from EGU HAP emissions exists, that imposition of the other requirements of the CAA would not address the identified hazards, and that there are controls available to reduce such emissions, then EPA must also consider whether the cost of regulating the HAP emissions from such units are unreasonable such that they override the benefit of obtaining permanent and ongoing reductions in HAP emissions from EGUs and the other advantages of regulation under section

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<sup>28</sup> Section 112 Legislative history not specifically directed at EGUs also supports the consideration of criteria pollutant benefits attributable to the regulation of HAP emissions. Specifically, the Senate report for the 1990 CAA amendments states: "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." A Legislative History of the Clean Air Act Amendments of 1990 (CAA Legislative History), Vol. 5, pp. 8512 (CAA Amendments of 1989; p. 172; Report of the Committee on Environment and Public Works S. 1630)

112 (e.g. monitoring of HAP emissions and an evaluation of the remaining risk from HAP emissions from EGUs). If EPA were to conclude, prior to considering costs, that such emissions posed no risk or that such risks had already been addressed by the CAA, a decision that regulation is not appropriate could be made without considering cost. Yet, the statutory focus on protecting human health and the environment suggests that the EPA could not make a finding under CAA section 112(n)(1)(A) solely on the basis of cost. Section 112 is based on a determination that HAP emissions are inherently harmful and instructs EPA to reduce the risks to human health and the environment, including the risks to the most sensitive populations from those harms, by reducing the volume of HAP emissions from stationary sources. Where unaddressed risks are identified, therefore, the advantages of addressing those risks must be considered and balanced against the costs or disadvantages, taking into account the statutory goals. That is the task undertaken by the EPA in this action.

The EPA also reasonably interpreted CAA section 112(n)(1)(A) to guide its evaluation of whether the costs are reasonable in light of the advantages of regulation and the statutory objectives. The EPA has concluded that for EGUs, it is reasonable to evaluate the industry's ability to afford compliance with MATS in part by determining the impact of such standards on the industry's ability to perform its primary function – the generation, transmission and distribution of affordable and reliable electricity. As explained in the proposed supplemental finding, the EPA considered several different cost metrics to evaluate whether compliance with MATS is reasonable for the power industry.

The EPA also concludes that a benefit-cost analysis is not required to support a finding that regulation is appropriate. However, to the extent a benefit-cost analysis is used to evaluate whether regulation of HAP emissions from EGUs is appropriate, it is reasonable for EPA to consider all benefits that would be a direct result of the rule. The benefit-cost analysis in the RIA that accompanied the final MATS thus presents a reasonable evaluation of the costs and benefits of the final MATS rule. This benefit-cost analysis as well as the cost analyses explained in the *Federal Register* notice each independently support EPA's proposed supplemental determination.

### ***III. CAA section 112(d)(3) Minimum Stringency Standards are Technologically Feasible and Cost Reasonable and the Statute Includes Additional Flexibility for the Agency to Reduce the Cost of Compliance***

Section 112(d) includes provisions to ensure that standards are technologically feasible and cost reasonable and that the benefit of uniform reductions in HAP emissions is realized. EPA did not directly address this issue in the final MATS rule or explicitly rely on this aspect of the statutory structure to support the interpretation of 112(n)(1)(A) made in the final MATS rule. *See, e.g., Michigan* 135 S.Ct. at 2710. Below, EPA explains the numerous ways in which cost are implicitly and explicitly taken into account in setting standards under section 112. Congress's determination that the MACT floors are based on emission levels actually achieved by existing similar sources in the same category or subcategory inherently incorporates

considerations of cost and technological feasibility. In addition, section 112(d) contains sufficient flexibility to allow the Agency to further minimize the cost of standards without jeopardizing the goals of the statute.<sup>29</sup> In fact, the manner in which EPA considered cost in developing the MATS rule demonstrates the sufficient flexibility in the statutory scheme.

This section explains the numerous ways in which cost considerations explicitly and implicitly influenced the emission standards set in MATS. The flexibility the Agency was able to incorporate into the standard setting process confirms that the statutory scheme ensures that the standards are technologically feasible and cost reasonable to achieve the statutory goals. In addition, the changes to MATS between the proposal and final rule, including efforts to reduce the costs of compliance, resulted in lowering the estimated annual cost in the RIA of the final rule by more than \$1 billion (from \$10.9 billion in the proposal to \$9.6 billion in the final rule).

### **A. Data Collection Efforts**

The EPA's efforts to ensure the cost reasonableness of the MATS standards began with the data collection process. The EPA conducted a significant information collection request to ensure that it had data from the best performing sources so that when it calculated MACT floors for certain HAP based on the average emission limitation achieved by the best performing 12 percent of sources (for which the Administrator had data), it would be doing so based on a number of sources that represents 12 percent of all the sources in the category. In addition, when developing the information collection request itself, the EPA limited the number of EGUs required to perform testing by identifying the best performing 15 percent of sources for certain classes of HAP (non-mercury metal HAP and PM, acid gas HAP and SO<sub>2</sub>, and organic HAP), instead of requiring every source to provide HAP emissions data. This approach allowed the EPA to collect sufficient data to establish the MACT floors for PM and metal HAP and acid gas HAP (e.g., HCl) and SO<sub>2</sub> based on sources representing 12 percent of the entire source category without requiring all EGUs to collect HAP emissions data. The EPA was thereby able to avoid requiring expensive HAP testing for all of the over 1300 EGUs and focus the testing primarily on the better performing sources that would likely have to incur less cost to comply with the eventual standards.

### **B. Work Practice Standards**

The EPA also used its authority under CAA section 112(h) to establish a work practice

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<sup>29</sup> Even in 2000, EPA recognized the general stringency of section 112(d)(3) standards and discussed statutory mechanisms available to reduce the costs of such standards. See 65 FR at 79830. For example, the EPA stated that “[o]nce the source category is divided into subcategories, the EPA determines the “floor” for each subcategory and, in turn, the emissions standards independently for each subcategory. This approach has helped build flexibility in meeting environmental objectives in the past.” *Id.* The Agency also discussed the availability of averaging emissions among units at the same facility, wherein sources are authorized to control HAP to different levels as long as the facility as a whole remains in compliance. *Id.* (“the law allows for differences in reductions among units as long as the source as a whole is in compliance.”).

standard in lieu of numeric emission standards for organic HAP because the data collected from those sources showed that the best performing EGUs predominantly emit organic HAP at levels below the method detection levels for such HAP. The best control for organic HAP is complete, efficient combustion so the EPA required as a work practice that EGUs conduct regular tune-ups and the Agency provided flexibility as to timing so that sources could plan the tune-ups during scheduled off-line periods. In addition, unlike other control approaches, the tune-up requirement has the potential to pay for itself through gained efficiency resulting in lower fuel usage. Thus, for organic HAP, the EPA was able to use its discretion to regulate the HAP with little cost and gain increased efficiency through the requirement, which means fewer wasted resources and less potential for HAP emissions.

### **C. Subcategorization of EGUs**

Section 112(d)(1) authorizes the EPA to subcategorize source categories based on class, type or size. Subcategorization decisions frequently have the practical impact of lowering overall compliance costs as the standards reflect what is actually being achieved by different classes, types and sizes of sources within a category.

In MATS, the EPA established two subcategories for coal-fired EGUs and four subcategories for oil-fired EGUs. For coal-fired EGUs, the EPA created a subcategory for mercury only for units designed for low rank virgin coal because the EPA determined such units were of a different type and no units burning such coal were among the best performing 12 percent of coal-fired EGUs for mercury control. The resulting standards for the non-low rank coal EGUs were very close to the standards that would have been established if the low rank units were included in the calculation. The mercury standard for the low rank EGUs, however, was considerably less stringent as a result of the subcategory (i.e.,  $4 \times 10^{-2}$  compared  $2 \times 10^{-4}$  for non-low rank units). In fact, the standard for low rank coal-fired EGUs reflects a beyond the floor level of control, which the EPA justified after considering costs and other factors as explained further below. See *White Stallion*, 748 F.3d at 1251 (rejecting petition challenging the standard for low rank coal-fired EGUs).

The EPA also established four subcategories for oil-fired EGUs – solid oil; non-continental liquid oil; continental liquid oil; and limited-use liquid oil. The EPA created the continental and non-continental liquid oil fired subcategories because of fuel-oil availability issues for non-continental units. The resulting non-continental standards are less stringent. In addition, the EPA established at the final rule stage a limited-use liquid oil-fired EGU subcategory so that certain reliability critical oil-fired EGUs could remain in place and be subject to work practice standards only. The EPA defined the category by its annual utilization to ensure that the potential uncontrolled emissions would be minimal and at the same time ensure power remains available during weather or other emergency situations.

The EPA's subcategory determinations, while made based on class, type or size of unit, led to less costly standards for certain subcategories of sources, and, in the case of limited-use liquid oil units, specifically addressed potential reliability issues.

#### **D. Beyond-the-floor analysis**

After determining the MACT floor for each HAP, the statute requires the EPA to determine whether more stringent controls of HAP are warranted after considering cost, non-air quality environmental health and environmental impacts, and energy requirements. The EPA conducted a beyond the floor analysis as required for EGUs and only established one standard at a beyond the floor level of control -- a mercury standard for the low rank coal subcategory. The EPA determined that the beyond the floor level of control was cost effective by determining the cost per pound of the additional mercury reductions and comparing that to the cost the EPA determined was reasonable for other source categories. *See White Stallion*, 748 F.3d at 1251 (rejecting challenge to the mercury standard for low rank coal-fired EGUs). In all other cases, the EPA determined not to establish standards based on a beyond the floor level of control, even though additional control would have further reduced the risk posed by HAP emissions from EGUs, in primary part due to the additional cost of those controls. The EPA determined that the cost of control was not reasonable for the incremental reductions in HAP emissions, but, with the exception of conversion to natural gas, the EPA did not conclude that EGUs would be unable to afford the additional levels of control. Thus, the EPA exercised its discretion in determining not to impose additional costs on EGUs.

#### **E. Surrogates for non-mercury metallic HAP and acid gas HAP**

The EPA also reduced ongoing compliance costs for EGUs through the establishment of surrogate standards that allow sources to monitor only a few surrogate pollutants instead of all the HAP emitted from EGUs. In the MATS rule, filterable PM is a surrogate for 10 identified non-mercury metal HAP emitted from EGUs, and sources that comply with the filterable PM limit have to test only for filterable PM instead of each individual non-mercury metal HAP. Many EGUs are already subject to a PM standard and required to test for PM as well. Thus, the EPA's establishment of PM as a surrogate for non-mercury metal HAP reduces the cost of that monitoring. The EPA also established total metals as a surrogate for all the non-mercury metal HAP, and this alternative also provides potential cost savings when used in lieu of compliance with the individual non-mercury metal HAP standards.

The EPA established HCl as a surrogate for all acid gas HAP emissions from EGUs (e.g. HCl, HF, HCN, and SeO<sub>2</sub>). The Agency also provided SO<sub>2</sub> as an alternative equivalent surrogate for the acid gas HAP emitted from EGUs, provided the EGU also has FGD controls installed and operates those controls whenever the EGU is operating. Because all EGUs subject to the MATS rule are also subject to the title IV Acid Rain Program and are required to continuously monitor SO<sub>2</sub> emissions, the use of SO<sub>2</sub> as a surrogate for acid gas HAP reduces the monitoring and reporting costs associated with SO<sub>2</sub> almost to zero for those EGUs that choose to comply with that alternative.

## **F. Monitoring, recordkeeping and reporting flexibilities included in the final MATS rule**

In the final rule, the EPA established multiple flexibilities for EGU owners or operators to utilize when demonstrating compliance. These flexibilities ensure that EGU owners or operators have the opportunity to streamline their emissions quantification procedures (i.e., techniques used to measure, monitor, test, or report emissions) according to the site-specific characteristics of their facilities. For example, EGUs owners and operators can elect to utilize existing monitoring equipment rather than installing and maintaining new HAP-specific monitors. Operators can utilize existing SO<sub>2</sub> continuous emissions monitoring systems (CEMS) rather than installing new monitoring equipment specifically for HCl and HF. Similarly, operators can take advantage of existing PM CEMS rather than having to measure emissions of the each of the individual HAP-metals. This flexibility provides cost-savings to the affected sources as they can use existing monitoring equipment instead purchasing new equipment and also avoid the additional on-going operational and maintenance costs for new monitors.

Another flexibility available to EGU owners or operators is the ability to choose between demonstrating compliance with the non-mercury metal standard (using PM as a surrogate) either through use of quarterly stack testing or through the use of a PM/HAP-metal CEMS, allowing for site-specific optimization of any current emissions quantification measurements or procedures (note: quarterly stack testing is not an option for non-liquid oil-fired EGUs).

The low emitting EGU (or LEE) approach for existing sources represents another of the emissions quantification flexibilities provided by MATS. In exchange for demonstrating and maintaining emissions much lower than those required by the rule, EGU owners or operators are able to avoid installation and operation of sophisticated measurement instruments. Demonstrating LEE status allows units to extend the duration of time between ongoing testing to demonstrate compliance as well as to re-verify LEE program eligibility. More specifically, when mercury emissions are shown to be less than ten percent of the standard or less than 29 pounds per year, ongoing tests are extended from quarterly to annually. When emissions other than mercury are shown to be less than fifty percent of the standard, ongoing tests are extended from quarterly to every three years.

By way of example, once an EGU owner or operator achieves LEE eligibility for PM, the source will incur about \$18 thousand in testing and travel costs every 3 years, as opposed to about \$72 thousand in annual testing and travel costs for the quarterly testing compliance option and to an estimated installation cost of \$211 thousand and an annual cost of about \$55 thousand for an extractive PM CEMS.

An additional flexibility is the ability to comply with either input- or output-based emission standards. This choice allows EGU owners or operators the ability to take advantage of existing monitoring equipment and to realize output-based emission reductions through investments in heat rate (efficiency) improvements.

The EPA also allowed EGUs in the same subcategory at the same facility to average their emission among those units. Many EGU facilities contain multiple EGUs within the same subcategory. By allowing averaging, the EPA provided sources with the ability to over-control some units and minimally control others and still reduce HAP emissions by the same amount as would be required if each unit complied individually.

All of these emission quantification flexibilities allow EGU owners or operators to demonstrate compliance with the final rule requirements in a way that is as least burdensome as practicable.