How and Why the U.S. EPA Is Changing its Policy on Mercury

IISD-ELA REPORT

IISD
International Institute for Sustainable Development

ELA 50
IISD Experimental Lakes Area

Marina Puzyreva

April 2019

© 2019 International Institute for Sustainable Development | IISD.org/ela

© 2019 International Institute for Sustainable Development
Published by the International Institute for Sustainable Development

International Institute for Sustainable Development

The International Institute for Sustainable Development (IISD) is an independent think tank championing sustainable solutions to 21st–century problems. Our mission is to promote human development and environmental sustainability. We do this through research, analysis and knowledge products that support sound policy-making. Our big-picture view allows us to address the root causes of some of the greatest challenges facing our planet today: ecological destruction, social exclusion, unfair laws and economic rules, a changing climate. IISD's staff of over 120 people, plus over 50 associates and 100 consultants, come from across the globe and from many disciplines. Our work affects lives in nearly 100 countries. Part scientist, part strategist—IISD delivers the knowledge to act.

IISD is registered as a charitable organization in Canada and has 501(c)(3) status in the United States. IISD receives core operating support from the Province of Manitoba and project funding from numerous governments inside and outside Canada, United Nations agencies, foundations, the private sector and individuals.

Head Office

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Tel: +1 (204) 958-7700
Website: www.iisd.org
Twitter: @IISD_news

About IISD-ELA

IISD Experimental Lakes Area (IISD-ELA) is the world's freshwater laboratory. A series of 58 lakes and their watersheds in northwestern Ontario, Canada, IISD-ELA is a unique scientific site where researchers can experiment directly on freshwater lakes to discover the impacts of human activity and pollutants. Since 1968, IISD-ELA has helped us reveal everything from the impact of phosphorus on algal blooms, to the effects of mercury on freshwater systems, to how acid rain affects lakes. The site works with local and global researchers and with local communities, First Nations, schools and universities. It is funded by the governments of Canada, Ontario and Manitoba, and by many other generous partners and donors.

IISD-ELA

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Tel: +1 (204) 958-7700
Website: www.iisd.org/ela
Twitter: @IISD_ELA

How and Why the U.S. EPA Is Changing its Policy on Mercury

April 2019

Written by Marina Puzyreva

Executive Summary

The United States Environmental Protection Agency (U.S. EPA) has proposed revising the cost–benefit methodology applied in the regulatory process when justifying pollution-control regulations. This could have serious negative implications for controlling hazardous air pollutants (HAPs) and other contaminants.

The broad health benefits realized after the establishment of the Mercury and Air Toxics Standards (MATS) for coal- and oil-fired plants in the United States in 2012 can hardly be disputed: 11,000 premature deaths prevented, 4,700 fewer heart attacks and 130,000 fewer asthma attacks, among other health benefits. In addition, the efforts of electric utilities to transition toward cleaner sources of energy are underway.

However, the billions of dollars in compliance costs to power plants and the Trump administration's prioritization of industrial interests over the environment have led the U.S. EPA to change its regulatory approach, specifically targeting co-benefits. The U.S. EPA suggests that co-benefits of the MATS (i.e., reduction in pollutants not directly regulated by the MATS rule, such as particulate matter [$PM_{2.5}$]) should not be part of the cost–benefit analysis when determining that the regulation is "appropriate and necessary" under the Clean Air Act (CAA).

Co-benefits account for over 90 per cent of total monetized benefits of the MATS. Removing them from calculations dramatically lowers the monetized benefits of the regulation relative to cost of compliance. This methodology revision does not directly change the MATS or remove coal- and oil-fired electric generating units from the CAA list of affected source categories. However, it opens the door for any future changes, especially since the U.S. EPA is soliciting comments on whether an alternative interpretation of the finding can be applied that would provide the U.S. EPA authority to rescind the MATS or to remove coal- and oil-fired electric generating units from the CAA list of affected source categories.

Considering pressing environmental challenges and global commitments on mercury and carbon dioxide, the change in regulatory approach and potential reversal of HAP regulations are detrimental and unnecessarily threaten air quality and public health. They are also creating regulatory uncertainly for electric utilities, who are asking to keep the standards in place.

Table of Contents

Abbreviations and Acronyms

CAA	Clean Air Act
EGU	electric utility steam generating unit
HAP	hazardous air pollutant
MATS	Mercury and Air Toxics Standards
MeHg	methyl mercury
NESHAP	National Emission Standards for Hazardous Air Pollutants
NPRM	Notice of Proposed Rulemaking
$PM_{2.5}$	particulate matter below 2.5 μm in diameter
U.S. EPA	United States Environmental Protection Agency

1.0 Introduction

The United States Environmental Protection Agency (U.S. EPA) has proposed reconsidering the importance of co-benefits in the cost–benefit methodology applied in the regulatory process when justifying pollution-control regulations. It concludes that the regulation—Mercury and Air Toxics Standards (MATS)—for coal- and oil-fired plants is not in fact cost-effective and should not be considered "appropriate and necessary" under the Clean Air Act (CAA) (National Emission Standards for Hazardous Air Pollutants [NESHAP]: Coal- and Oil-Fired Electric Utility Steam Generating Units — Reconsideration of Supplemental Finding and Residual Risk and Technology Review, 2018). This could have serious negative implications for controlling hazardous air pollutants (HAPs) and other contaminants in the future.

This paper examines the importance of regulating mercury emissions, details a typical rule-making process in the United States, and discusses the original MATS regulation and the potential implications of the proposed methodological changes to regulating mercury and other pollutants.

2.0 Why Is it Important to Regulate Mercury Emissions?

The largest emitters of mercury are the power plants burning coal for energy (Streets et al., 2018). Once mercury is released into the air, it can travel long distances before being deposited onto land and water (Gade, 2015). Once mercury reaches lakes, rivers and other waterbodies, microorganisms convert mercury into a more toxic form, methyl mercury (MeHg), that bioaccumulates in the aquatic food web (Gade, 2015). As a result, concentrations of MeHg in larger predatory fish may exceed the concentrations in the freshwater body in which they live typically on the order of one million times (U.S. EPA, 2011). Exposure to MeHg, even in small amounts, can lead to serious health problems. MeHg is a potential neurotoxin that affects the human central nervous system. Infants born to mothers who were exposed to MeHg (e.g., through fish consumption) have a high risk of experiencing developmental delays and major symptoms such as deafness and cerebral palsy (Gade, 2015). In adults, exposure to MeHg can lead to cardiovascular diseases and cancer (Gade, 2015; Genchi et al., 2017).

The IISD Experimental Lakes Area in Ontario, Canada, studied the effects of changes in atmospheric mercury deposition on MeHg accumulation by fish and other biota in a large collaborative whole-ecosystem manipulation called the Mercury Experiment to Assess Atmospheric Loading in Canada and the United States (METAALICUS). The results have shown that a decline in atmospheric mercury deposition results in a decline in MeHg levels in fish (Blanchfield et al., 2011; Hrenchuk et al., 2013; International Institute for Sustainable Development, 2017). This provides strong evidence for regulating mercury emissions by setting national limits on mercury emissions from power plants.

3.0 What Are the MATS?

The U.S. EPA proposed its first national emission standards to control release of mercury and other HAPs in 2011. The MATS affected new and existing commercial coal- and oil-fired electric utility steam generating units (EGUs) with a capacity equal to or greater than 25 megawatts. The installation of maximum achievable control technology standards achieved by the best performing sources was expected to not only dramatically reduce mercury and other

HAP releases into the atmosphere but also sulphur dioxide, nitrogen oxides and particulate matter ($PM_{2.5}$) (U.S. EPA, 2011).

Over 700,000 comments were submitted from the public in response to the MATS rule—substantially more than for any other prior regulatory proposal (U.S. EPA, n.d.a). After careful consideration of the comments, the U.S. EPA issued the file rule, largely unchanged, in February 2012.

The MATS have significantly contributed to reducing mercury in the environment and improving public health at a lower cost than anticipated (Harvard TH Chan School of Public Health, 2018). The MATS regulation was also instrumental in fulfilling the country's requirements under the international Minamata Convention on Mercury (2018), which the United States simultaneously signed and ratified in November 2013.

Under the MATS, EGUs were given three years to comply, with the possibility of a one-year extension until April 2016. The MATS applied to about **600 power plants**, which included **1,400 existing coal- and oil-fired EGUs** (NESHAP: Coal- and Oil-Fired Electric Utility Steam Generating Units — Reconsideration of Supplemental Finding and Residual Risk and Technology Review, 2018). Some units have been retired as a result of the MATS and other factors (Edison Electric Institute et al., 2018), and, as of early 2018, there remained 323 facilities with 713 EGUs (NESHAP: Coal- and Oil-Fired Electric Utility Steam Generating Units — Reconsideration of Supplemental Finding and Residual Risk and Technology Review, 2018).

As a result of the MATS and a number of other contributing factors, considerable decreases in mercury emissions have been achieved (Figure 1). From 2006 to 2016, mercury air emissions declined by 86 per cent or 36 tonnes (U.S. EPA, 2018a). This decrease was somewhat offset by the increased disposal of mercury on land during the same period, which is attributed to higher rates of mercury capture and disposal as a result of the improved air emission controls (U.S. EPA, 2018a).

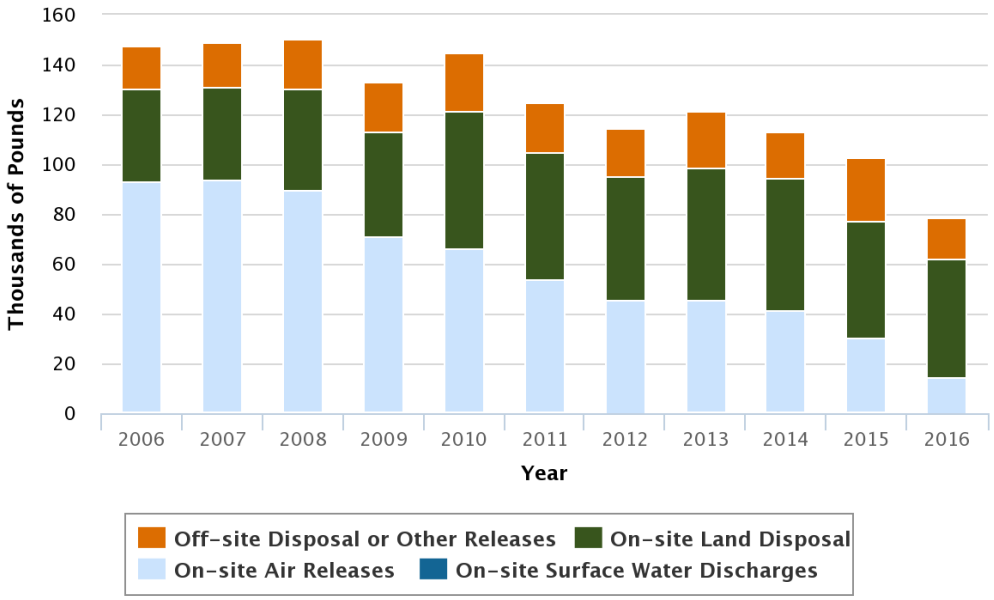


Figure 1. Total disposal or other releases of mercury: Electric utilities

Source: U.S. EPA, 2018a.

4.0 The Rule-Making Process in the United States

In a typical rule-making process in the United States, agencies must follow an open public process, which includes publishing a statement of rule-making authority in the Federal Register for all advanced notices, proposed and final rules. Figure 2 details the major steps.[1]

In addition to the process outlined in Figure 2, as an initial step, the agency may publish an Advance Notice of Proposed Rulemaking to officially request comments from the public and test the public's reaction before publishing a Notice of Proposed Rulemaking (NPRM). It is important to note that a final decision will not be based on the number of comments in support of the rule over those in opposition to it. As specified in the Office of the Federal Register (2011), "an agency must base its reasoning and conclusions on the rule-making record, consisting of the comments, scientific data, expert opinions, and facts accumulated during the pre-rule and proposed rule stages" (p. 6). Nevertheless, an agency may undertake a review of the final rule based on a petition from the public.

Congress authorizes the U.S. EPA to create and enforce regulations that are consistent with enacted laws—the CCA in the case of the MATS. For the regulations addressing air pollution, the U.S. EPA must follow the requirements of CCA Section 112(n)(1)(A) and demonstrate that the regulation is "appropriate and necessary." This includes considering the results of the study detailing the emissions' rate and mass, health and environmental effects, available abatement technologies and the costs of such technologies (Section 112(n)(1)(B)). Moreover, the CAA requires establishing the list of regulated source categories, which was initially published in the Federal Register on July 16, 1992 (56 FR 31576). To date, the U.S. EPA has established national emission standards for HAPs for over 130 source categories (U.S. EPA, n.d.b).

After promulgation of these standards, pursuant to the CCA, a report—the Risk and Technology Review—needs to be completed and submitted to Congress. This report evaluates residual risks for each source category to ensure that the regulation protects public health with "an ample margin of safety" (Section 112(f)(2)9a)). If the U.S. EPA determines that residual risk standards are necessary, it must promulgate them within eight years of the NESHAP.

Executive Order 12866, Regulatory Planning and Review issued in 1993 by President Clinton sets forth the requirement for all significant regulatory actions to "assess both the costs and the benefits of the intended regulation" (Section 1(6)) and to acknowledge unquantifiable costs in determining that the benefits of the intended regulation justify its costs. The rules are considered "significant" due to economic effects[2] or because they raise important policy issues. The Executive Order instructs agencies to provide the assessments to the Office of Information and Regulatory Affairs for review.

Executive Order 13563 (2011) reaffirms the principles, structures and definitions of the regulatory review established in Executive Order 12866 and requires a "reasoned determination" that the regulation's benefits justify its costs, "recognizing that some benefits and costs are difficult to quantify" (p. 3821).

Pursuant to both orders, the U.S. EPA published a Regulatory Impact Analysis for the final MATS rule in 2011 detailing the costs and benefits of the regulation (Box 1). As a result of this analysis, it was determined that the benefits outweigh the costs between 3:1 and 9:1 (U.S. EPA, 2011).

[1] For more information on the variations in this process, see Office of the Federal Register (2011).

[2] They have an annual effect on the economy of USD 100 million or more or adversely affect the economy, public health and safety or the environment.

Once Congress has passed a law, it is then up to the relevant regulatory agency to develop appropriate rules to operationalize the law.

Rules are issued by federal agencies, boards, or commissions. Essentially, they explain how agencies intend to carry out laws.

The graphic below illustrates the basic process by which agencies develop and finalize significant rules—as defined by Executive Order 12866—to have a potentially significant effect on the American economy.

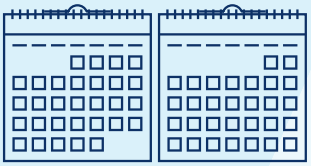
1. Congress passes a law.

2. The agency drafts a proposed rule intended to implement that law, which is then reviewed by the Office of Information and Regulatory Affairs (OIRA).

3. A Notice of Proposed Rulemaking is published in the Federal Register to notify the public about the proposed rule and to solicit comments. The comment period usually lasts 30–60 days.

4. The agency reviews those public comments and incorporates them into the final rule.

5. The President and the OIRA approve the final rule before it is published in the Federal Register.



6. The final rule is effective 60 days after publication.

IISD

Figure 2. Process of rule-making in the United States

Box 1. Cost–benefit assessment in the MATS Regulatory Impact Analysis

The Regulatory Impact Analysis estimated costs and benefits associated with the regulation at the MATS's full implementation. The analysis also acknowledged the costs and benefits that could not be quantified due to complexity and data limitations.

Total Benefits: USD 37 million–90 billion (estimates in 2007 USD)

Benefits are comprised of the positive impacts of air quality improvements on health due to reductions in mercury itself ("target pollutant" benefits) and reductions in other pollutants (co-benefits) that occur when the technology to control for HAPs is deployed.

Monetized direct benefits:
Increase in IQ in children born to a subset of recreational anglers who consume freshwater fish and seafood contaminated by MeHg during pregnancy. Benefits are quantified as an increase in lifetime earnings of children in the amount of USD 0.47 million–USD 6.2 million, net of schooling costs, depending on the methodology and the discount rate used.

Monetized co-benefits:
Installing the technology necessary to reduce mercury emissions would also reduce direct emissions of $PM_{2.5}$ and sulphur dioxide, a precursor to $PM_{2.5}$ formation. These reductions were expected to avert up to 11,000 premature deaths, 4,700 heart attacks and 130,000 asthma attacks **every year**. Monetized co-benefits also included climate co-benefits from reductions in carbon dioxide. Reductions in $PM_{2.5}$-related premature fatalities each year accounted for over 90 per cent of total monetized benefits.

Important target and ancillary benefits that could not be quantified: economic value of impacts from reductions in other HAPs (apart from mercury) such as arsenic, benzene, cadmium, chlorine, formaldehyde, lead, manganese, nickel and selenium; health benefits from reductions in sulphur dioxide or nitrogen dioxide; improved road visibility as a result of reduced nitrogen oxide, sulphur dioxide and $PM_{2.5}$; vegetation benefits from reducing ozone; reduced terrestrial and aquatic acidification; and some additional mercury benefits such as impacts on ecosystems and wildlife.

Total Costs: USD 9.6 billion (in 2007 USD)

Total social costs are a sum of the compliance, monitoring, recordkeeping and reporting costs for coal- and oil-fired EGUs to continue to provide a given level of electricity demand.

Source: U.S. EPA, 2011.

The above methodology and process to form the "appropriate and necessary" finding regarding MATS were challenged in court. In *Michigan v. U.S. EPA* (June 2015), the U.S. Supreme Court ruled 5–4 in favour of Michigan that the U.S. EPA did not interpret the CAA correctly by failing to consider costs before it made its initial finding that MATS was "appropriate and necessary" (Irfan, 2018). The following year, as a response, the U.S. EPA (2016) issued a **Supplemental Finding** that detailed how the agency explicitly considered cost as part of the "appropriate and necessary" finding. Within the hours of this publication, Murray Energy Corp, a large coal miner, filed a lawsuit against the U.S. EPA at the Court of Appeals for the D.C. Circuit (*Murray Energy v. U.S. EPA*, 2016). In April 2017, due to a change in administration, the U.S. EPA filed a petition to delay indefinitely the legal battle, to which the D.C. Circuit agreed (Levinson, 2018).

5.0 Why Is it no Longer "Appropriate and Necessary" to Regulate HAP Emissions From Power Plants?

Following the change in administration in early 2017, the U.S. EPA has taken gradual steps to promote President Trump's agenda to increase coal production by rolling back existing rules and regulations.

In summer 2018, the U.S. EPA issued an Advance NPRM: Increasing Consistency and Transparency in Considering Costs and Benefits in the Rulemaking Process (2018).[3] The notice stated that variations existed across divisions and offices "regarding the nature and scope of the cost and benefit considerations" (p. 27525). Rather than proposing regulatory requirements, it sought public input more generally on the matter of developing internal approaches and policies to increase consistency and transparency in weighing costs and benefits in the rule-making process. This pre-rule-stage publication tested public opinion and led to a future ruling more directly challenging the role of co-benefits in the cost–benefit analysis in the case of MATS.

On December 27, 2018, the acting U.S. EPA Administrator, Andrew R. Wheeler, who is a former lobbyist for the coal industry, signed the NPRM **to replace the agency's 2016 Supplemental Finding** in *Michigan v. U.S. EPA* (NESHAP: Coal- and Oil-Fired Electric Utility Steam Generating Units Reconsideration of Supplemental Finding and Residual Risk and Technology Review, 2018). NESHAP: Coal- and Oil-Fired Electric Utility Steam Generating Units Reconsideration of Supplemental Finding and Residual Risk and Technology Review (2018)[4] concludes that the reliance on the particulate matter ($PM_{2.5}$) air quality co-benefits in cost–benefit calculations was flawed. The U.S. EPA proposes to directly compare the cost of compliance with MATS with the benefits specifically associated with reducing HAP emissions, in this case a decrease in mercury concentrations in fish and IQ benefits. Since this approach dramatically lowers the monetized benefits of the regulation relative to the cost of compliance, the U.S. EPA proposes to find that it is not in fact "appropriate and necessary" to regulate HAP emissions from coal- and oil-fired EGUs under CAA Section 112(n)(1)(A)[5] (NESHAP: Coal- and Oil-Fired Electric Utility Steam Generating Units Reconsideration of Supplemental Finding and Residual Risk and Technology Review, 2018).

The rule also proposes the results of the Residual Risk and Technology Review[6] that the agency is required to compete in accordance with Section 112 of the CAA. The U.S. EPA concluded that residual risks due to emissions of air toxins from coal- and oil-fired EGUs are "acceptable and that the current standards provide an ample margin of safety to protect public health" (NESHAP: Coal- and Oil-Fired Electric Utility Steam Generating Units — Reconsideration of Supplemental Finding and Residual Risk and Technology Review, 2018).

[3] Link to the Docket Folder https://www.regulations.gov/docket?D=EPA-HQ-OA-2018-0107

[4] The official version was published in the Federal Register on February 7, 2017. The EPA has a comment period open until April 17, 2019. The EPA also plans to hold at least one public hearing in connection to this proposed rule. Link to the Docket Folder: https://www.regulations.gov/docket?D=EPA-HQ-OAR-2018-0794

[5] Link to the official NPRM: https://www.regulations.gov/document?D=EPA-HQ-OAR-2018-0794-0001

[6] Under the CAA, the Risk and Technology Review for MATS is supposed to be completed by early 2020 (Reilly, 2018).

6.0 What Are the Immediate Implications of This New Finding?

The notice states that the new finding will not remove the coal- and oil-fired EGU source category from the CAA Section 112(c) list of regulated sources and will not affect the standards in place that regulate HAP emissions from coal- and oil-fired EGUs. So, in the meantime, the MATS will stay in place.

The agency is nevertheless soliciting comments on whether the **alternative interpretation** of the reversal of the 2016 Supplemental Finding should be considered, which would give the U.S. EPA authority or obligation to rescind the MATS or to remove coal- and oil-fired EGUs from the CAA list of affected source categories (NESHAP: Coal- and Oil-Fired Electric Utility Steam Generating Units — Reconsideration of Supplemental Finding and Residual Risk and Technology Review, 2018).

Following through with the alternative interpretation of this finding in the future rulings is a logical next step given the current administration's goal to "cancel job-killing restrictions on the production of American energy" (Mooney & Mufson, 2016). Rolling back restrictions on mercury emissions would allow the administration to address one of the obstacles to building new coal power plants. However, in practical terms, it is evident from the industry's response that growth in coal production will not directly follow these regulatory changes.

7.0 What Has Been the Response From the Industry?

The proposed rule to review the interpretation of costs and benefits in the rule-making process, and specifically the treatment of co-benefits, claims to provide consistency and greater regulatory certainty for the "regulated entities to better plan for future regulatory requirements" (Increasing Consistency and Transparency in Considering Costs and Benefits in the Rulemaking Process, 2018). However, by affecting the standards already in place, the proposed rule regarding cost–benefit analysis and the revised 2016 Supplemental Finding for MATS in fact create more regulatory uncertainly for the coal- and oil-based power plants (Edison Electric Institute et al., 2018).

Several umbrella organizations representing hundreds of electric utilities, such as the Clean Energy Group and the Edison Electric Institute, wrote a letter to the U.S. EPA in July 2018 asking for "regulatory and business certainty" "as they continue to provide safe, reliable, affordable, and increasingly clean energy to their customers" (Edison Electric Institute et al., 2018). The owners and operators of coal- and oil-based EGUs have already invested more than USD 18 billion in the pollution-control upgrades and are recovering these costs from electricity customers through regulated pricing (Edison Electric Institute et al., 2018; Pamuk, 2018).

Many power units that were retired due to the MATS and other factors such as low natural gas price and resource planning initiatives have been decommissioned and cannot be reinstated (Edison Electric Institute et al., 2018). As the companies are gradually moving toward cleaner sources of energy, the industry is asking for a stable regulatory environment to continue the full implementation of the MATS.

8.0 What Are the Potential Long-Term Consequences?

Reversing the long-standing practice of including co-benefits for the rule-making process at the U.S. EPA can have far-reaching negative consequences. As noted in Sunstein (2018), counting co-benefits only when they are not produced by other regulations has solid reasoning; however, the agency's message sounds "far more extreme: It won't count co-benefits—period."

Investments in the pollution-control equipment required by the MATS reduced harmful pollutants like $PM_{2.5}$ and avoided thousands of deaths and incidences of diseases each year, which is the major outcome of this regulatory action and, therefore, cannot be simply disregarded. The other side of the ambitious plan to revive the coal mining sector is ultimately people's increased spending on health, rising health insurance costs and reduced worker productivity. To add to the soundness of the regulation, the new science suggests that even the direct benefits from reducing mercury releases have been greatly underestimated in the U.S. EPA's original analysis (MIT Institute for Data, Systems, and Society, 2016; Sunderland et al., 2016).

Moreover, the substantial benefits of reducing mercury and other HAPs remain unquantified due to data limitations. The revised 2016 Supplemental Finding acknowledged these unquantified benefits; however, they were not considered "sufficient to overcome the significant difference between the monetized benefits and costs" (NESHAP: Coal- and Oil-Fired Electric Utility Steam Generating Units — Reconsideration of Supplemental Finding and Residual Risk and Technology Review, 2018) and thus could not support the "appropriate and necessary" requirement to regulate HAPs under the CAA.

Estimates for the cost–benefit analyses are the result of complex calculations that will always be subject to uncertainties and can therefore be challenged. What assumptions and methods should be used? How should the intangible benefits or other benefits that cannot be quantified be incorporated? The researchers at the Massachusetts Institute of Technology suggest that a **formal, monetized cost–benefit analysis is not the preferred approach** for weighing the advantages and disadvantages of policy under Section 112(n)(1)(A) of the CAA (MIT Institute for Data, Systems, and Society, 2016).

Clearly, the U.S. EPA is set on excluding co-benefits, ignoring new science and the importance of intangible benefits, utilizing the narrow cost–benefit approach to fulfill the pledges of the current administration. Even though the revised finding does not directly change the MATS or remove coal- and oil-fired EGUs from the CAA list of affected source categories, it opens the door for any future changes, especially since the U.S. EPA is soliciting comments on whether the alternative interpretation of the finding can be applied. The reversal of the 2016 Supplemental Finding and the accompanying methodology revisions, if adopted as a final rule, can lead to developing further steps to delist coal- and oil-fired EGUs or rescind the MATS, thus creating a rule-making precedent for less stringent pollution regulations in the future.

The narrower scope of the cost–benefit approach already creates uncertainties around other environmental regulations, and especially the first-ever carbon dioxide pollution standards for power plants and fuel economy standards for light-duty vehicles[7] (Saiyid, 2018).

In Canada, similar to the United States, the coal-fired electric power generation sector is the largest single remaining anthropogenic source of mercury emissions to the atmosphere (Canadian Council of Ministers of the

[7] The proposed rule would retain the model year 2020 standards for passenger cars and light trucks manufactured for sale in the United States in model years 2021 through 2026, as opposed to the requirement of a 3–4 per cent increase in efficiency and reduction in greenhouse gas emissions per mile per year promulgated in the final rule of the Obama administration (International Council on Clean Transportation, 2018; The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks, 2018).

Environment, 2006). The Canadian Council of Ministers of the Environment endorsed the *Canada-Wide Standards for Mercury Emissions from Coal-Fired Electric Power Generation Plants* in 2006. The regulation set a nationwide cap of 60 per cent mercury capture by 2010. According to Environment and Climate Change Canada (2016), 17 per cent of mercury deposited in Canada comes from the United States. The impacts of proposed changes on the health of Canadians are uncertain and will depend on the outcome of the consultation process, the U.S. EPA's next steps and industry's response to any mercury regulation changes. However, if new plants are built and mercury emissions increase, Canada may expect adverse health impacts due to the transboundary transport of the pollutant, especially for Indigenous populations fishing for subsistence.

References

Blanchfield, P., Paterson, M., Hrenchuk, L., Hintelmann, H., & Harris, R. (2011, October 2–5). A whole-ecosystem study to determine the response of fish methyl mercury levels to changes in atmospheric deposition of inorganic mercury. Poster presented at the 38th Annual Aquatic Toxicity Workshop, Winnipeg, Manitoba.

Canadian Council of Ministers of the Environment. (2006). *Canada-wide Standards for Mercury Emissions from Coal-Fired Electric Power Generation Plants*. Retrieved from https://www.ccme.ca/files/Resources/air/mercury/hg_epg_cws_w_annex.pdf

Clean Air Task Force. (n.d.). Health benefits of the Obama power plant regulations. Retrieved from https://www.catf.us/educational/health-benefits-obama-power-plant-regulations/

Edison Electric Institute, American Public Power Association, National Rural Electric Cooperative Association, Clean Energy Group, Class of '85 Regulatory Response Group, International Brotherhood of Electrical Workers, International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers & Helpers. (2018, July). Letter to the Honorable William L. Wehrum, Assistant Administrator at Office of Air and Radiation, U.S. EPA. Retrieved from https://www.eenews.net/assets/2018/07/11/document_gw_04.pdf

Environment and Climate Change Canada. (2016). *Canadian Mercury Science Assessment: Summary of key results*. Retrieved from http://publications.gc.ca/collections/collection_2016/eccc/En84-130-2-2016-eng.pdf

Executive Order 12866, 3 CFR 51735. (September 30, 1993). Regulatory Planning and Review. Retrieved from https://www.reginfo.gov/public/jsp/Utilities/EO_12866.pdf

Executive Order 13563, 3 CFR 2011–1385 Improving Regulation and Regulatory Review. 76 Fed. Reg. 14 (January 21, 2011). Retrieved from https://www.govinfo.gov/content/pkg/FR-2011-01-21/pdf/2011-1385.pdf

Gade, D. (2015). *Mercury emissions from coal-fired powerplants* (Environmental Management & Risk Assessment PH 560, Paper 4). Retrieved from http://digitalcommons.wku.edu/pubh_560/4

Genchi G., Sinicropi M.S., Carocci A., Lauria G., & Catalano, A. (2017). Mercury exposure and heart diseases. *International Journal of Environmental Research and Public Health, 14*(1), 74. DOI:10.3390/ijerph14010074.

Harvard TH Chan School of Public Health. (2018, December). *Mercury matters 2018: A science brief for journalists and policymakers*. Retrieved from https://cdn1.sph.harvard.edu/wp-content/uploads/sites/2238/2018/12/Mercury-science-backgrounder_final1.pdf

Hrenchuk, L., Blanchfield, P., Van Walleghem, J., Rudd, J., & Hintelmann, H. (2013). *The response of fish mercury levels to changes in inorganic mercury loading*. Presentation at Canadian Conference for Fisheries Research (CCFFR), Windsor, ON.

Increasing Consistency and Transparency in Considering Costs and Benefits in the Rulemaking Process. 83 Fed. Reg. 222 (November 16, 2018). Retrieved from https://www.govinfo.gov/content/pkg/FR-2018-11-16/pdf/2018-24084.pdf

International Council on Clean Transportation. (2018, October 26). Comments on the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks. Retrieved from https://www.theicct.org/news/comments-safe-regulation-2021-2026

International Institute for Sustainable Development. (2017, April 5). How we do things at IISD-ELA: Researching mercury. [Video file]. Retrieved from https://www.youtube.com/watch?v=ceC4J_F3NZA

Irfan, U. (2018, December 28). The EPA wants to make it harder to ratchet down toxic chemicals from power plants. *Vox*. Retrieved from https://www.vox.com/2018/12/28/18159509/mats-mercury-epa-toxic-coal-power-plant

Levinson, A. (2018). *Mercury and Air Toxics Standards: Co-benefits and the courts in U.S. cost-benefit analysis*. Retrieved from http://faculty.georgetown.edu/aml6/pdfs&zips/MATS%20case%20study.pdf

Minamata Convention on Mercury. (2018). *List of countries having deposited their instrument of ratification, acceptance, approval of or accession to The Minamata Convention on Mercury*. Retrieved from http://www.mercuryconvention.org/Portals/11/documents/List%20of%20Parties/16-Oct-2018-Minamata-Ratifications.pdf

MIT Institute for Data, Systems, and Society. (2016, January 15). Comments on Supplemental Finding That It Is Appropriate and Necessary To Regulate Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units. Retrieved from https://www.regulations.gov/document?D=EPA-HQ-OAR-2009-0234-20544

Mooney, C., & Mufson, S. (2016, November 22). Trump wants to lift restrictions on 'clean coal.' Whatever that is. *Washington Post*. Retrieved from https://www.washingtonpost.com/news/energy-environment/wp/2016/11/22/trump-wants-to-lift-restrictions-on-clean-coal-whatever-that-is/?noredirect=on&utm_term=.f0c5cf7a12cb

Murray Energy v. EPA, No. 16-1127 (D.C. Cir.)

National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units — Reconsideration of Supplemental Finding and Residual Risk and Technology Review, 40 CFR 63 (2018). Retrieved from https://www.epa.gov/sites/production/files/2018-12/documents/frnmatsfindingandrtr_12_2018wdisc.pdf

National Emission Standards for Hazardous Air Pollutants from Coal and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial- Commercial-Institutional Steam Generating Units, 40 CFR Parts 60 and 63 (February 16, 2012). Retrieved from https://www.govinfo.gov/content/pkg/FR-2016-04-06/pdf/2016-06563.pdf

Office of the Federal Register. (2011). *A guide to the rule-making process*. Retrieved from https://www.federalregister.gov/uploads/2011/01/the_rulemaking_process.pdf

Pamuk, H. (2018, December 28). U.S. limits on coal plant mercury emissions too costly: Trump's EPA. *Reuters*. Retrieved from https://www.reuters.com/article/us-usa-coal-epa/u-s-limits-on-coal-plant-mercury-emissions-too-costly-trumps-epa-idUSKCN1OR1BU

Reilly, S. (2018, July 11). In about-face, utilities urge EPA to keep mercury rule. *E&E News*. Retrieved from https://www.eenews.net/stories/1060088801

Saiyid, A. H. (2018, September 7). EPA lays groundwork for avoiding future power plant mercury rules. *Bloomberg BNA*. Retrieved from https://www.bna.com/epa-lays-groundwork-n73014482357/

Streets, D. G., Lu, Z., Levin, L., ter Schure, A. F. H., & Sunderland, E. M. (2018). Historical releases of mercury to air, land, and water from coal combustion. *Science of the Total Environment, 615*, 131–140. Retrieved from https://doi.org/10.1016/j.scitotenv.2017.09.207

Sunderland, E.M., Driscoll, Jr., C.T., Hammitt, J.K., Grandjean, P., Evans, J.S., Blum, J.D., … Jacobs, W. (2016). Benefits of regulating hazardous air pollutants from coal and oil-fired utilities in the United States. *Environmental Science & Technology, 50*(5), 2117–2120. Retrieved from https://pubs.acs.org/doi/pdf/10.1021/acs.est.6b00239v

Sunstein, C. R. (2018, October 3). Weaken mercury regulations? It's scarier than it sounds. *Bloomberg Opinion*. Retrieved from https://www.bloomberg.com/opinion/articles/2018-10-03/epa-mercury-regulations-should-reflect-all-benefits-and-all-costs

Supplemental Finding That It Is Appropriate and Necessary To Regulate Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units. 40 CFR 63 (April 25, 2016). Retrieved from https://www.govinfo.gov/content/pkg/FR-2016-04-25/pdf/2016-09429.pdf

The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks. EPA 49 CFR 85 and 86, NHTSA 49 CFR Parts 523, 531, 533, 536, 537 (August 24, 2018). Retrieved from https://www.govinfo.gov/content/pkg/FR-2018-08-24/pdf/2018-16820.pdf

U.S. Environmental Protection Agency (U.S. EPA). (2011, December). *Regulatory impact analysis, final mercury and air toxics standards* (EPA-452/R-11-011). Research Triangle Park, NC: Office of Air Quality Planning and Standards. Retrieved from https://www3.epa.gov/ttnecas1/regdata/RIAs/matsriafinal.pdf

U.S. Environmental Protection Agency. (2018a). *Comparing industry sectors* (TRI National Analysis 2016). Retrieved from https://www.epa.gov/sites/production/files/2018-01/documents/comparing_industry_sectors.pdf

U.S. Environmental Protection Agency. (2018b, January). *TRI National Analysis 2016*. Retrieved from https://www.epa.gov/sites/production/files/2018-01/documents/tri_national_analysis_2016_complete_0.pdf

U.S. Environmental Protection Agency. (n.d.a). Fact Sheet: Mercury and Air Toxics Standards for Power Plants. Retrieved from https://www.epa.gov/sites/production/files/2015-11/documents/20111221matssummaryfs.pdf

U.S. Environmental Protection Agency. (n.d.b). National Emission Standards for Hazardous Air Pollutants (NESHAP). Retrieved from https://www.epa.gov/stationary-sources-air-pollution/national-emission-standards-hazardous-air-pollutants-neshap-9

U.S. Environmental Protection Agency. (n.d.c). Healthier Americans. Retrieved from https://www.epa.gov/mats/healthier-americans

©2019 The International Institute for Sustainable Development
Published by the International Institute for Sustainable Development.

Head Office

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Tel: +1 (204) 958-7700
Website: www.iisd.org
Twitter: @IISD_news

IISD

iisd.org