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ARTICLE

**PHANTOM REGULATION:
NEW SUPREME COURT ALGORITHM CHANGING
EXECUTIVE POWER**

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I. PHANTOM REGULATION

The Supreme Court fundamentally altered executive branch power and leverage to make law in America. In its 5-4 decision in *Michigan v. Environmental Protection Agency*,¹ and for the first time, the Supreme Court mandated consideration of economic cost as the new fulcrum for exercise of executive branch law-making power.² Amid daily palpable

¹ *Michigan v. Env'tl. Prot. Agency*, 135 S.Ct. 2699 (2015).

² The federalist form of government, in which there is substantial separate power at the state or provincial levels in addition to at the federal level, include the United States (50 states, 2 commonwealths, and 12 territories primarily in the Pacific Ocean), Canada (10 provinces and 2 territories), Mexico (31 states), Brazil (26 states), Germany (16 states), Switzerland (26 cantons) Argentina (23 provinces), Australia (6 states and 2 territories),

friction between the executive and legislative branches of government in the United States,³ previously untouchable conventional *Chevron* deference⁴ to executive branch power was altered. This article legally navigates through each aspect of this change: It analyzes current and future implications, of, and arising controversies with, the new Supreme Court economic requirement on the exercise of executive power in American government.

The Obama administration utilized executive branch action and regulations to create new law without needing to involve the legislature;⁵ the Trump administration is using unilateral executive orders, without involving the Congress, to attempt to dismember parts of the regulated state.⁶ This new Supreme Court decision changes legal requirements for executive actions applied in either direction. Friction between U.S. branches of government was a common denominator⁷ before the jobs of coal miners

and India (29 states and 7 territories). This list includes the most significant and economically successful non-Communist countries on 5 continents, North America, Central America, South America, Europe, and Australia, as well as India in Asia. This form of government, while only shared in a small number of countries, has been employed in successful countries. See *List of Countries By System of Government*, http://cs.mcgill.ca/~rwest/wikispeedia/wpcd/wp/l/List_of_countries_by_system_of_government.htm (summarizing countries that employ federalism as a form of government); see also *Federalism*, <https://en.wikipedia.org/wiki/Federalism> (providing background on federalism as a system of government).

³ Michele Richinick & Joy Y. Yang, *Obama Sharply Criticizes Congress in White House Address*, MSNBC (Aug. 1, 2014), <http://www.msnbc.com/msnbc/obama-sharply-criticizes-congress-white-house-address#52721> (providing instance of tension between government branches during Obama presidency); Robert Draper, *Trump vs. Congress: Now What?* N.Y. TIMES MAGAZINE, (Mar. 26, 2017), <https://www.nytimes.com/2017/03/26/magazine/trump-vs-congress-now-what.html> (providing instance of tension between government branches during Trump presidency).

⁴ *Chevron U.S.A. Inc. v. Nat. Res. Def. Council*, 467 U.S. 837, 843 (1984).

⁵ See Steven Ferrey, *Presidential Executive Action: Unilaterally Changing the World's Critical Technology and Infrastructure*, 64 DRAKE L.R. 43 (2016) (Providing instance of executive branch creating law without legislature under Obama).

⁶ Jacqueline Alemany, *Trump Signs Executive Order Dismantling Obama Environmental Regulations*, CBS NEWS (March 28, 2017), <http://www.cbsnews.com/news/trump-signs-executive-order-dismantling-obama-environmental-regulations/> (Providing instance of Trump Administration using unilateral executive orders); Dan Boyce, *Trump Targets EPA And Obama Climate Change Regulations*, INSIDE ENERGY, <http://insideenergy.org/2017/03/29/trump-targets-epa-and-obama-climate-change-regulations/> (suspending the Clean Power Plan of the EPA).

⁷ Alemany, *supra* note 6.

were a central topic in the most recent presidential election,⁸ with this administrative conflict already in motion in the courts.

The Obama Administration Environmental Protection Agency (EPA) promulgated its Mercury and Air Toxics Standard (“MATS”) rule to reign in coal use and climate-changing emissions.⁹ The rule imposed approximately \$9.6 billion in costs annually on the U.S. economy as the means to realize direct public hazardous pollutant benefits of \$4 to 5 million annually.¹⁰ The costs of complying with this regulation were approximately 2,000 times greater than its estimated *direct* benefits of reducing hazardous coal-power plants’ air pollution, without adding indirect “co-benefits.”¹¹

When states challenged when the executive agency initially failed to consider these costs which the regulation imposed on the U.S. economy, the Supreme Court ruled this unilateral executive action to be illegal.¹² The Court created and imposed a new *de novo* “cost” consideration on the exercise of certain executive powers, even though the legislature did not expressly require any consideration of cost for this rule.¹³ Cost now exists as a phantom presence stalking future executive branch regulation, created *sue sponte* by the Court without statutory command. This Supreme Court decision in *Michigan v. EPA* shifts power between the Constitution’s Article I legislative branch and the Article II executive branch of American government. This article analyzes in detail the layers of legal complexities and examines still unresolved uncertainties of this new rule of administrative and constitutional law.

Section II examines sequentially all relevant executive orders on cost and economics issued as part of the prior five presidential administrations. Section II sets the legal stage, focusing particularly on cost consideration by the executive branch when promulgating environmental regulations and climate change rules. This flows into the key recent Supreme Court decision imposing a new legal requirement on Obama

⁸ Clifford Krauss & Michael Corkery, *A Bleak Outlook for Trump’s Promises to Coal Miners*, N.Y. TIMES, (Nov. 19), 2016, <https://www.nytimes.com/2016/11/20/business/energy-environment/a-bleak-outlook-for-trumps-promises-to-coal-miners.html>.

⁹ *Michigan*, 135 S.Ct. at 2705-06 (citing 77 Fed. Reg. 9326).

¹⁰ *Id.*

¹¹ The controversy concerning co-benefits is discussed in detail, *infra.*, at Section V.

¹² See *Michigan*, 135 S.Ct. at 2699 (providing that the Supreme Court ruled unilateral executive action to be illegal).

¹³ See *id.* at 2711 (demonstrating that the U.S. Supreme Court established a *de novo* cost consideration).

Administration executive branch regulation of carbon-emitting coal in the U.S. power sector.¹⁴

When this rule was challenged in *Michigan v. EPA*, the Supreme Court, *sue sponte*, imposed a never-before-manifest cost restraint on the exercise of executive branch power.¹⁵ Section III analyzes this Supreme Court decision restraining executive power. Building the law on technology, Section III first examines the technology of coal in the U.S. economy. On this foundation, Section III goes on to analyze the Obama Administration MATS rule, parses the legal basis of the five-justice majority opinion, reflects critically on key elements of the four-justice dissent, and traces the original contours of the dissent by Judge Kavanaugh as well as the opinion of the majority of the D.C. Circuit Court of Appeals that was reversed by the Court.

Section IV examines every operand¹⁶ of this newly imposed cost algorithm for American law. In *Michigan v. EPA*,¹⁷ costs outweighed direct benefits by approximately 2000:1. Substituting the agency's choice of operand to add indirect co-benefits, reversed the regulatory economics to make indirect benefits exceed costs.¹⁸ Critics alleged that agencies will double-count so-called 'co-benefits' to transform a directly not cost-beneficial executive regulation to be indirectly beneficial.¹⁹ Section IV dissects absolute costs, derivative costs, and disputed costs as elements of a cost analysis. Section IV takes the next step from the *Michigan* case of first impression, to examine whether executive branch agencies can employ their own algorithm on costs and benefits to steer the economic outcome of the newly required cost consideration.

Section V exumes the "cost" phantom now lurking in administrative law. Section V examines the legal positions now asserted by the reversed federal agency, state Attorneys General, and private sector stakeholders on what is or is not an acceptable math algorithm regarding alleged 'double-counting' of co-benefits. The *Michigan* Supreme Court decision leaves the

¹⁴ See *infra*, Section II.

¹⁵ See *Michigan*, 135 S.Ct. at 2699 (indicating that the Supreme Court imposed a cost restraint on executive branch power).

¹⁶ Meriam-Webster defines an "operand" as "something (such as a quantity or data) that is operated on (as in a mathematical operation)." MERIAM-WEBSTER ONLINE, <https://www.merriam-webster.com/dictionary/operand> (last visited Nov. 28, 2017).

¹⁷ See *Michigan*, 135 S.Ct. at 2706 (providing instance where costs substantially outweighed benefits).

¹⁸ See *infra*. Section IV.

¹⁹ See *infra*. Section IV.

choice of the cost algorithm initially to the agency;²⁰ once selected and applied, the algorithm will be challenged whenever the imposed costs are billions of dollars annually, as they were in the *Michigan* case.²¹

Section VI navigates through the Administrative Procedure Act²² as interpreted by the Court, now reshaping conventional *Chevron* deference as the decision rule for the executive branch.²³ *Chevron* is legally foundational: it is the most cited administrative law precedent by the Supreme Court year after year²⁴ and one of the twenty most-cited Supreme Court cases in the history of the Court.²⁵ The *Michigan* Court changed *Chevron* deference. As analyzed in the next sections, the legal contours and constraints of administrative law are altered and still evolving.

II. PRECIPITATION OF A CONSTITUTIONAL CONFLICT

A. Constitutional Federalism Separating Branch I and Branch II

Federalism principles in the U.S. Constitution of checks and balances between executive and legislative branches separate the power of the branches of government. The U.S. Constitution Art. 1, § 8, gave Congress the power to make laws “necessary and proper” for carrying all other powers vested in Congress by the U.S. Constitution.²⁶ “Necessary and proper” is a broad umbrella, which ultimately the Supreme Court must interpret.²⁷ This works on two levels: (1) The federal government has authority to enact necessary and proper laws, and (2) once federal laws are enacted, administering federal agencies must stay within their grants of

²⁰ *Michigan*, 135 S.Ct. at 2711.

²¹ *Id.* at 2706.

²² 5 U.S.C. 551, *et seq.*

²³ *Chevron*, 467 U.S. at 837.

²⁴ Chris Walker, *Most Cited Supreme Court Administrative Law Decisions*, YALE J. ON REG.: NOTICE & COMMENT (Oct. 9, 2014).

²⁵ See *Most-Cited U.S. Supreme Court Cases in Hein Online Part II*, HEIN ONLINE BLOG, <http://heinonline.blogspot.com/2009/01/most-cited-us-supreme-court-cases-in.html> (supporting proposition that *Chevron* is frequently cited).

²⁶ U.S. CONST. art. 1, § 8.

²⁷ See *McCulloch v. Maryland*, 17 U.S. 316 (1819) (explaining that Chief Justice Marshall found that “necessary and proper” is broad enough to allow Congress to establish a bank to aid in carrying out the taxing and borrowing powers vested in the Congress under Article 1, § 8).

authority under specific laws. In recent confrontations, there has been particular focus on regulatory authority under the 1970 Clean Air Act.²⁸

And at this point in time, much of the focus is on climate change and global warming. Global energy-related emissions of carbon are expected to increase 57% from 2005 to 2030.²⁹ At current rates of energy development worldwide, energy-related CO₂ emissions in 2050 would be 150% of their current levels under business-as-usual development, primarily due to increased energy use.³⁰ This Organization for Economic Cooperation and Development (OECD) forecast is shown in Figure 1.³¹ The Intergovernmental Panel on Climate Change (IPCC) in 2014 concluded that in order to maintain world warming below 2° Celsius (C), there must be a 40-70% reduction of GHG emissions from 2010 levels by 2050.³²

Figure 1³³

²⁸ See *infra*. Section III.

²⁹ U.S. GOV'T. ACCOUNTABILITY OFFICE, GAO-09-151, INTERNATIONAL CLIMATE CHANGE PROGRAMS: LESSONS LEARNED FROM THE EUROPEAN UNION'S EMISSIONS TRADING SCHEME AND THE KYOTO PROTOCOL'S CLEAN DEVELOPMENT MECHANISM (Nov. 2008), <http://www.gao.gov/assets/290/283397.pdf>

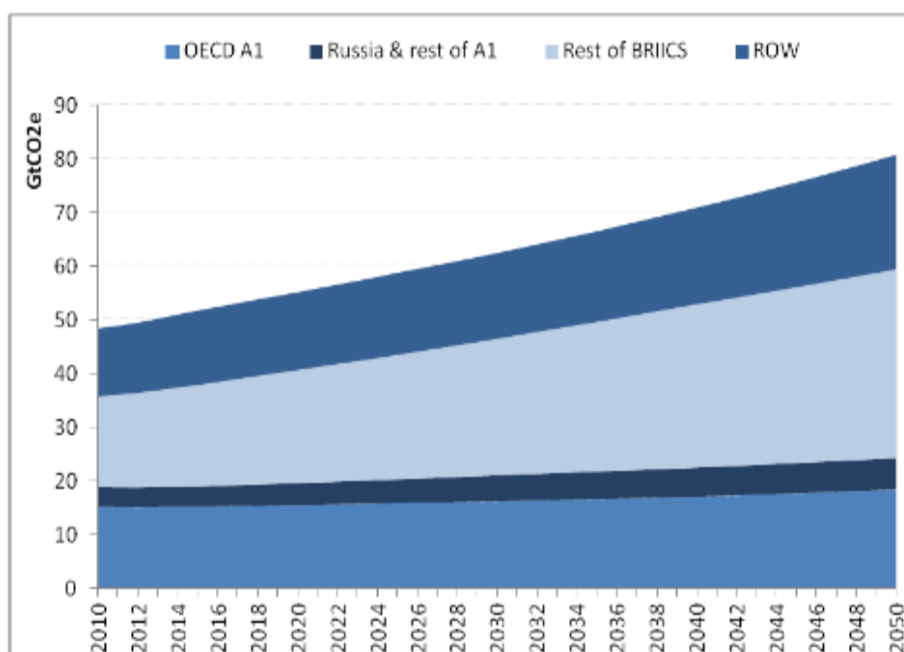
³⁰ Org. for Econ. Cooperation & Dev. (OECD), *Environmental Outlook to 2050: Key Findings on Climate Change*, http://www.oecd.org/env/cc/Outlook%20to%202050_Climate%20Change%20Chapter_HIGHLIGHTS-FINA-8pager-UPDATED%20NOV2012.pdf.

³¹ *Id.*

³² Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014 Synthesis Report Summary for Policymakers*, https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf.

³³ OECD, *supra* note 30 (“ROW” refers to “rest of the world”).

GHG emissions by region (in GtCO₂e): *Baseline scenario*



In 2013, without involving the Congress and using executive branch regulations, President Obama announced his “Climate Action Plan,” and directed EPA to work expeditiously to promulgate CO₂ emission standards for fossil fuel-fired power plants.³⁴ EPA estimated the benefits of its four Clean Air Act unilateral executive branch regulations would accrue a combined annual economic value of approximately \$500 billion, and \$2 trillion in 2020:³⁵

- The Cross-State Air Pollution Rule, promulgated in July 2011, requires that 27 eastern states reduce the amount of

³⁴ EXEC. OFFICE OF THE PRESIDENT, THE PRESIDENT’S CLIMATE ACTION PLAN (June 2013), <https://obamawhitehouse.archives.gov/sites/default/files/image/president27sclimateactionplan.pdf>.

³⁵ Nicholas Z. Muller & Robert Mendelson, *Efficient Pollution Regulations: Getting the Prices Right*, 99 AM. ECONOMIC REV. 1714 (2009).

emissions from cross-border power plants.³⁶ EPA estimated that this rule accrues total economic benefits between \$120 and \$280 billion annually.³⁷

- The Mercury and Air Toxics (MATs) rule, promulgated in December 2011, regulates mercury and other hazardous air pollution emitted from both new and old power plants, to deliver between \$37 and \$90 billion of benefits annually.³⁸
- The Industrial Boiler Rule, promulgated in April 2012, lowers the amount of air pollution that is released from commercial, industrial and institutional boilers to generate between \$27 and \$67 billion annually in health benefits.³⁹
- The Cement Kiln Rule, promulgated in August 2010, reduces mercury and other air pollutants from cement plants across the country to generate an estimated \$7-\$19 billion annually in benefits.⁴⁰

EPA estimates the economic benefits of the four rules based in saved lives, averted emergency and hospital visits, prevented non-fatal heart attacks, and cost savings from missed work and school days.⁴¹ In essence,

³⁶ See *Overview of the Cross-State Air Pollution Rule*, ENVTL. PROT. AGENCY (2011), <https://www.epa.gov/csapr/overview-cross-state-air-pollution-rule-csapr> (describing EPA rule on cross state air pollution).

³⁷ *Cross State Air Pollution Rule: Reducing Air Pollution Protecting Public Health*, ENVTL. PROT. AGENCY, <https://www.epa.gov/sites/production/files/2016-09/documents/csaprpresentation.pdf>.

³⁸ *Mercury and Air Toxics Standards*, ENVTL. PROT. AGENCY, <https://www.epa.gov/mats>.

³⁹ Vol. 78, No. 21 FEDERAL REGISTER 7139 (Jan. 31, 2013), <https://www.gpo.gov/fdsys/pkg/FR-2013-01-31/pdf/2012-31646.pdf>.

⁴⁰ *Final Amendments to National Air Toxics Emission Standards and New Source Performance Standards for Portland Cement Manufacturing*, ENVTL. PROT. AGENCY, https://www.epa.gov/sites/production/files/2016-04/documents/080910_neshap_factsheet.pdf.

⁴¹ James Bradbury, *Bills That Would Limit the U.S. EPA's Clean Air Act Authorities*, WORLD RES. INST. (Apr. 19, 2011), <http://www.wri.org/stories/2011/04/bills-would-limit-us-epas-clean-air-act-authorities>; FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING 59-61 (2004).

the reductions in chronic health conditions constitute the overwhelming share of the cost savings attributed to air pollution prevention, where health care accounts for a significant portion of all levels of governments' budgets.⁴² EPA concluded that more than 160,000 lives were saved in 2010 because of the reductions in ozone and particulate matter following the 1990 Clean Air Act Amendments which were estimated to deliver economic benefits of approximately "\$2 trillion in 2020."⁴³ EPA conducted a Secondary Prospective Analysis in 2011 which showed an incremental increase in direct annual costs of air pollution control of approximately \$70 per capita in 2000, \$170 per capita in 2010, and \$190 per capita in 2020.⁴⁴

"Benefits" associated with environmental rules represent quantified estimated health impacts. "In 2012, OMB reported estimated annual benefits from major federal regulations totaling \$141 billion to \$691 billion and estimated annual costs of \$42.4 billion to \$66.3 billion for fiscal years 2001 through 2011, with EPA regulations accounting for 60 to 82 percent of the benefits and 43 to 53 percent of the costs."⁴⁵ All of these initiatives thrust the use of coal-fired power into the spotlight.

⁴² ELIZABETH MORSS & DAVID R. WOOLEY, *THE CLEAN AIR ACT HANDBOOK* 4 (26th ed. 2016) (providing that this includes the Medicaid and Medicare programs, where Medicare incurs upwards of 45% of the medical bills of treating and managing air pollution induced diseases while Medicaid [split between federal and states government funds] covers over 20% of these costs); *see also* Britt Groosman et al., *The Ancillary Benefits from Climate Policy in the United States*, 50 *Envtl. & Resource Econ.* 585 (providing that while some scholars argue that co-pollutant concerns should not inform climate policy, there is strong correlation between GHGs and traditionally regulated pollutants under the Clean Air Act).

⁴³ Teresa B. Clemmer, *Staving off the Climate Crisis: The Sectoral Approach under the Clean Air Act*, 40 *ENVTL. L.* 1125, 1138 (2010).

⁴⁴ *Envtl. Prot. Agency, The Benefits and Costs of the Clean Air Act*, Final Report – Rev. A at 3-7 (indicating that a large proportion of these costs are associated with direct capital investments in technology and other applications).

⁴⁵ U.S. Gen. Accounting Office, GAO-14-519, *EPA Should Improve Adherence to Guidance for Selected Elements of Regulatory Impact Analyses*, Report to Congressional Requesters (July 2014), <http://www.gao.gov/assets/670/664872.pdf>; *see also* Office of Management and Budget, *Regulatory Analysis: Circular A-4 to the Heads of Executive Agencies and Establishments*, 68 *Fed. Reg.* 58366 (2003), https://obamawhitehouse.archives.gov/omb/circulars_a004_a-4/ (describing the benefit side of cost-benefit analyses); Organization for Economic Co-operation and Development, *Executive Summary, Cost-Benefit Analysis and the Environment*, at 19 (2006) ("Any project or policy that destroys or depreciates an environmental asset needs to include in its costs the [total economic value, or TEV] of the lost asset. Similarly, in any project or policy that enhances an environmental asset, the change in the TEV of the asset needs to be counted as

Regarding regulation under the Clean Air Act, there is a specified division of state and federal authority where states have the “first-implementer role,”⁴⁶ while EPA “is relegated. . . to a secondary role.”⁴⁷ However, within this Clean Air Act envelope, there is no federal case law, nor any Federal Energy Regulatory Commission (FERC), Department of Energy (DOE), or Environmental Protection Agency (EPA) rules, which have, or can, resolve direct conflicts between counting environmental ‘benefits’ against the cost imposed on the operation of power generation units to reduce polluting operation.⁴⁸

Efforts of the Obama administration to regulate the environment and climate focused on the power sector, with ‘cost’ emerging as a new legal factor in three key matters:

- The attempt to restrict power plant hazardous mercury emissions, which was overturned and remanded by the Supreme Court in *Michigan v. EPA*⁴⁹
- The attempt to regulate interstate migration of criteria air pollutants, eventually upheld by the Supreme Court in *EME Homer*⁵⁰
- The attempt to restrict CO₂ global warming emissions, focusing on coal-fired power plants, which was preliminarily enjoined indefinitely by the Supreme Court in *West Virginia*.⁵¹

And ‘cost’ is the primary area where the Supreme Court has altered the separation of power and the line between executive and legislative branch

a benefit. For instance, ecosystems produce many services and hence the TEV of any ecosystem tends to be equal to the discounted value of those services.”)

⁴⁶ *EME Homer City Generation, L.P. v. EPA*, 696 F.3d 7, 31 (D.C. Cir. 2012) (quoting *Train v. Natural Res. Def. Council*, 421 U.S. 60, 79 (1975)) (emphasis omitted).

⁴⁷ *Train*, 421 U.S. at 79.

⁴⁸ Steven Ferrey, “*Broken at Both Ends the Need to Reconnect Energy and Environment*,” 65 SYRACUSE L.R. 1044, 97 (2015).

⁴⁹ *Michigan*, 135 S.Ct. at 2711.

⁵⁰ *EME Homer City Generation L.P.*, 696 F.3d at 31, *rev’d. by E.P.A. v. EME Homer City Generation, L.P.*, 134 S.Ct. 1584 (2014).

⁵¹ Order in Pending Case, *West Virginia v. EPA*, 577 U.S. (February 9, 2016) (No. 157A773) (indefinite stay by Court).

discretion. Of note, Judge Kavanaugh, before he was nominated to be a member of the Supreme Court, was a member of the D.C. Circuit panel which rendered the first two of these three opinions. The Supreme Court upheld his dissent in *Michigan*, and partially overturned the majority opinion he joined in *EME Homer*.⁵²

B. Cost-Benefit and EPA Regulation—the Context

The Supreme Court discovery of costs, has some history. The U.S. Flood Control Act of 1936 mandated the evaluation of proposed projects to ascertain that the overall benefits outweigh the cost of the project.⁵³ Since then, consideration of cost became part of the regulatory process, performing analysis of cost and inflationary impacts during the terms of Presidents Nixon and Ford.⁵⁴ The federal Office of Management and Budget (OMB), in its role overseeing regulatory initiatives of all other government agencies, developed guidelines on researching regulatory options that produce maximized net benefits.⁵⁵ OMB, following executive orders, has instructed agencies to conduct benefit-cost analysis to improve transparency in the regulatory process unless the same is prohibited by law, such as under the Clean Air Act National Ambient Air Quality Standards (NAAQS) that implicitly prohibits benefit-cost analysis.⁵⁶

During President Carter's term, the agencies were required to perform cost-effectiveness studies, and during the term of President Reagan, cost-benefit analysis became a mandatory step in the regulatory process.⁵⁷ President Reagan issued executive order 12291 requiring government agencies to perform Regulatory Impact Analysis (i.e. benefit-cost analysis) to reduce the burden of existing and future regulatory rules and require net benefits to the public.⁵⁸ In practice, the EPA has performed a comparative pros-cons test of every 'major rule' (including almost all the NAAQS rules)

⁵² *Michigan*, 135 S.Ct. at 2711; *EME Homer City Generation L.P.*, 696 F.3d at 32.

⁵³ EUSTON QUAH & RAYMOND TOH, *COST-BENEFIT ANALYSIS CASES AND MATERIALS* 6 (2012).

⁵⁴ Carolene Cecot & W. Kip Viscusi, *Judicial Review of Agency Benefit-Cost Analysis*, 22 *GEO. MASON. L. REV.* 575, 580 (2015).

⁵⁵ U.S. OMB, *Economic Analysis of Federal Regulations under Executive Order 12866* (Washington, D.C., January 1996).

⁵⁶ 42 U.S.C. §§ 7408(a), 7409(b)(1).

⁵⁷ Cecot, *supra* note 54, at 581.

⁵⁸ 46 Fed. Reg 13193.

since the Nixon Administration, which coincided with the most substantive Clean Air Act amendments.⁵⁹

Federal agencies, including the EPA, are required under Executive Order 12866, issued by President Clinton, to perform cost analysis when their actions are going to cause an economic impact on a scale of more than \$100 million per year, unless it is explicitly ordered otherwise by applicable statutes.⁶⁰ While determining what benefits are available, an agency is not restrained to consider only quantifiable benefits which can be measured in monetary units, but also allowed to consider qualitative benefits.⁶¹ While all the prior Executive Orders of prior Presidents remain in effect, President Obama issued Executive Order 13563 reaffirming that benefit-cost analysis is a mandatory part of the regulatory rulemaking process.⁶²

The era of modern environmental laws did not begin until 1970, with most federal environmental laws enacted between 1970 – 1980.⁶³ See Table 1.

Table 1: Major U.S. Environmental Laws

⁵⁹ See Frank Ackerman & Lisa Heinzerling, *Priceless: On Knowing the Price of Everything and the Value of Nothing* 58 (2004) at 59-61 (Outlining “richer is safer” studies and other cost-benefit analyses); Matthew D. Adler & Erik A. Posner, *Rethinking Cost-Benefit Analysis*, 109 YALE L. J. 165, 173-74 (1999) (highlighting cost-benefit analysis for agricultural pesticides).

⁶⁰ The Unfunded Mandates Reform Acts of 1995, Pub. L. No. 104-4, 109 Stat. 48 (1995) (codified at 2 U.S.C. § 32) (UMRA); Executive Order 12866, 58 Fed. Reg. 51735 (requiring agencies to perform cost study of rules impacting the economy. UMRA requires agencies to choose options which either reduces the cost due to the program or is the least burdensome to implement unless the agency can explain why the particular option should not be accepted; Executive Order 12866 guides agencies that while promulgating regulations benefitting the public by improving public health or the environment from the failure of private sector’s initiatives on their own, agencies assess “all costs and benefits of available regulatory alternatives”; Also “Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling public need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well-being of the American people. In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating.”).

⁶¹ *Id.* (“Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider.”).

⁶² Cecot, *supra* note 54, at 582; 76 FR 3821..

⁶³ STEVEN FERREY, *Environmental Law: Examples & Explanations*, 40 (7th ed. 2016).

Name of Statute	Known As	Year Passed
National Environmental Policy Act	NEPA	1970
Clean Air Act	CAA	1970
Clean Water Act	CWR	1972
Federal Insecticide, Fungicide, and Rodenticide Act	FIFRA	1972
Ocean Dumping Act		1972
Endangered Species Act	ESA	1973
Safe Drinking Water	SDWR	1974
Toxic Substances Control Act	TSCA	1976
Resources Conservation and Recovery Act	RCRA	1976
Comprehensive Environmental Response Compensation and Liability Act	Superfund or CERCLA	1980
Emergency Planning and Community Right to Know Act	EPCRA	1980

Since the early days of Clean Air Act amendments in 1970, EPA has incorporated cost as a factor in its rulemaking process, either as a cost of the technology to achieve the standards, or as cost-effectiveness or cost-benefit analysis based on the above executive orders. There were at least seventy-four Regulatory Impact Analysis (RIA) studies at EPA that factored cost either as part of a cost-effectiveness analysis or cost-benefit analysis to select between various options and technologies presented during the administrations of Presidents Reagan, H.W. Bush, and Clinton.⁶⁴ By contrast, in *Michigan v. EPA*, EPA claimed cost did not play any role

⁶⁴ Robert W. Hahn & Patrick M. Dudley, *How Well Does the U.S. Government Do Benefit-Cost Analysis?*, 1 REV. ENVTL. ECON. & POL'Y 192, 192-211 (2007).

during EPA's MATS rulemaking, until the Supreme Court overruled the agency.⁶⁵

In addition to the generic executive orders that consider costs, some statutes mandate that EPA perform benefit-cost analysis as part of promulgation of a regulation. And to the extent that the EPA follows or fails to follow this statutory mandate, courts are the arbiters. In *Portland Cement Ass'n v. Ruckelshaus*, EPA was challenged because EPA did not take economic cost into account while establishing standards of performance for Portland cement plants.⁶⁶ The EPA was then regulating the cement plants under Clean Air Act section 111(b)(1)(A) after the cement plants were designated as the stationary source of pollution contributing to the "endangerment of public health and welfare or [safety]."⁶⁷ In the Clean Air Act section 111(a), "standards of performance" are defined as a standard set by the administrator for the emission of an air pollutant given the best available technology and cost for attainment.⁶⁸ The petitioners were not

⁶⁵ See *Appalachian Power Co. v. EPA*, 135 F.3d 791 (1998) (holding that EPA reasonably interpreted statute outlining various facets of nitrogen oxide emission limits); see also *Arteva Specialties S.a.r.l. v. EPA*, 323 F.3d 1088 (2003) (explaining EPA considered cost while performing cost-effectiveness analysis for NESHAPs under Clean Air Act section 112(d)(2)); *Chevron*, 467 U.S. 837 (1984); *Whitman v. American Trucking Ass'n*, 531 U.S. 547 (2001) (providing that promulgating rules under Clean Air Act section 109, National Ambient Air Quality Standards, EPA is not required to consider cost-benefit analysis because unambiguous language of Act section 109 charges EPA to promulgate rule for public safety and does not required EPA to consider cost); *American Lung Assn. v. EPA*, 134 F.3d 388 (1998) (holding EPA did not adequately explain its conclusion that physical effects experienced by some asthmatics from exposure to short-term, high-level SO₂ bursts did not amount to public health problem).

⁶⁶ *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 379 (1973).

⁶⁷ *Id.* at 378.

⁶⁸ 42 U.S.C. § 111(a)(1) ("The term 'standard of performance' means a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated."). The EPA Administrator in the Background Document required under NEPA, recorded the findings of total economic cost to the cement industry as a result of promulgation of rules regulating cement plants and relied on this findings during the rulemaking process. See *Portland*, 486 F.2d at 387 (citation omitted) ("The Administrator found in the Background Document that, for a new wet-process plant with a capacity of 2.5 million barrels per year, the total investment for all installed air pollution control equipment will represent approximately 12 percent of the investment for the total facility. He also found that '[a]nnual operating costs for the control equipment will be

satisfied with the cost study done during the rulemaking process, and demanded that more quantified cost-benefit analysis. However, the court did not find the quantified benefit-cost analysis as a necessary requirement.⁶⁹

This resulting deference underwent a tectonic shift in the Supreme Court.

III. THE SUPREME COURT SUA SPONTE INJECTS ECONOMICS IN ADMINISTRATIVE LAW: MICHIGAN V. EPA

In *Michigan v. EPA*,⁷⁰ the Supreme Court had to interpret what needed to be part of the unilateral administrative process when promulgating the scope of an “appropriate and necessary” standard for regulation of certain traditional steam-cycle power generators, Electric Utility Steam Generating Units (EGUs), delegated by the Congress to the Environmental Protection Agency under the Clean Air Act.⁷¹

A. Coal, Mercury, Health

The Congressional Research Service noted that “[c]oal is an inherently ‘dirty’ fuel” that emits “sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulates, mercury, acid gases, and other pollutants, in greater abundance than other fossil fuels.”⁷² When burned to produce electricity, coal is the most pollutant-emitting fossil fuel.⁷³ Coal releases approximately

approximately 7 percent of the total plant operating costs if a baghouse is used for the kiln, and 5 percent if an electrostatic precipitator is used.”).

⁶⁹ *Id.* (“Such studies should be considered by the Administrator, if adduced in comments, but we do not inject them as a necessary condition of action.”); see also *Essex Chemical Corp. v. Ruckelhaus*, 486 F.2d 427, 437 (1973) (finding that EPA has considered cost while regulating Sulfur Dioxide pollution from Sulfuric Acid factories, even when EPA and the industry are differing in their opinion about the cost, EPA’s consideration of cost in rulemaking is enough and does not require cost/benefit analysis).

⁷⁰ *Michigan*, 135 S.Ct. 2699.

⁷¹ 42 U.S.C. § 7412(n)(1)(A).

⁷² JAMES E. MCCARTHY & CLAUDIA COPELAND, CONGRESSIONAL RESEARCH SERVICE, EPA’S REGULATION OF COAL-FIRED POWER: IS A “TRAIN WRECK” COMING (2011), <https://www.fas.org/sgp/crs/misc/R41914.pdf>.

⁷³ *Id.* The Congressional Research Service noted that “[c]oal is an inherently ‘dirty’ fuel. Burning it produces SO₂, NO_x, PM, mercury, acid gases, and other pollutants, in greater abundance than other fossil fuels.” JAMES MCCARTHY & CLAUDIA COPELAND, EPA’S

29% more carbon per unit of energy produced than does oil, and 80% more carbon per energy unit than does natural gas.”⁷⁴ Coal-fired power plants emit significantly more sulfur dioxide (SO₂), nitrogen oxides (NO_x), and particulate matter (PM), three of the six Clean Air Act regulated criteria pollutants, per megawatt hour (Mwh) of electric power generated compared to natural-gas and oil-fired plants.⁷⁵

Coal-fired power-generation units emit more hazardous air emissions, such as mercury, compared to other fossil-fuel power generation technologies.⁷⁶ Mercury (Hg) is a naturally occurring element,⁷⁷ released to the environment in significant quantities through burning coal.⁷⁸ Mercury is a pollutant which is regulated as a hazardous chemical by the Clean Air Act.⁷⁹ A study conducted by EPA over more than twenty years concluded that the nation’s power plants using coal as their fuel are the largest source of non-natural mercury deposition into the environment.⁸⁰ Mercury’s toxic effects on the human nervous system, digestive and immune systems, kidneys, lungs, skin, and eyes, lead to premature death of young children

REGULATION OF COAL-FIRED POWER: IS A “TRAIN WRECK” COMING (2011), at 5, <https://www.fas.org/sgp/crs/misc/R41914.pdf>.

⁷⁴ STEVEN FERREY, *LAW OF INDEPENDENT POWER*, Thomson Reuters, § 6:22 (46th ed., 201-87).

⁷⁵ *Id.*

⁷⁶ Environmental Protection Agency, *Reducing Toxic Pollution from Power Plants: Epa’s Proposed Mercury Standards 2* (2011), <http://www3.epa.gov/mats/pdfs/presentation.pdf> (providing hazards linked with coal generation units); JAMES MCCARTHY & CLAUDIA COPELAND, *EPA’S REGULATION OF COAL-FIRED POWER: IS A “TRAIN WRECK” COMING* (2011) at 5, <https://www.fas.org/sgp/crs/misc/R41914.pdf> (supporting coal-linked hazards).

⁷⁷ *Basic Information About Mercury*, EPA, <http://www2.epa.gov/mercury/basic-information-about-mercury>.

⁷⁸ *Id.*

⁷⁹ 42 U.S.C. § 7412 (2012).

⁸⁰ U.S. ENVTL. PROT. AGENCY, *Fact Sheet, Final Consideration of Cost In The Appropriate And Necessary Findings For The Mercury And Air Toxic Standards For Power Plants*, https://www.epa.gov/sites/production/files/2016-05/documents/20160414_mats_ff_fr_fs.pdf; See *Wildlife Guide*, <http://www.nwf.org/Wildlife/Threats-to-Wildlife/Pollutants/Mercury-and-Air-Toxics.aspx> (“Coal-fired power plants are the single largest source of mercury contamination in the U.S., responsible for approximately 50 percent of human-caused mercury emissions. Other sources include waste incinerators that burn mercury-containing products and chlorine manufacturers. However, unlike these sources, power plants have not had to limit their mercury pollution.”).

and people, and to adverse impact on the neurological development of the fetus.⁸¹

There are 400 coal-powered plants⁸² which have traditionally supplied 40 percent of U.S. electric power.⁸³ In 19 U.S. states, coal is the dominant source of electricity and in 13 states it supplies a majority of power generation.⁸⁴ Half of the mercury detected in the ambient air in states in the U.S. is from the sources within that state's boundary, while the other half migrates in from other upwind states.⁸⁵ Human-made sources emitted about 115 tons of mercury, with 42 percent of those tons (48 tons) coming from domestic coal-fired power plants.⁸⁶

Though power plants were not mandated by other EPA regulation to reduce mercury emissions *per se*, power plants indirectly are capturing about 27 tons of mercury per year through the emission controls installed directly to reduce other emissions of the criteria pollutants nitrogen oxides, sulfur dioxide, and particulate matter.⁸⁷ If coal-fired power plants were not using control systems to lessen the emission of these other criteria pollutants, total mercury emissions would be about 75 tons per year.⁸⁸ Mercury is categorized as a hazardous emission to the atmosphere that produces many adverse effects on human health. Congress lists mercury in the list of Hazardous Air Pollutants, which the EPA has an obligation to regulate under Section 112 of the Clean Air Act.⁸⁹ EPA did so both under

⁸¹ *Mercury and health*, WORLD HEALTH ORGANIZATION, (Mar. 2017), <http://www.who.int/mediacentre/factsheets/fs361/en/>.

⁸² John Muyskens, Dan Keating, & Samuel Granados, *Mapping How the United States Generates its Electricity*, WASH. POST (July 31, 2015), <http://www.washingtonpost.com/graphics/national/power-plants/>.

⁸³ Joby Warrick, *White House Set to Adopt Sweeping Curbs on Carbon Pollution*, WASH. POST (Aug. 1, 2015), https://www.washingtonpost.com/national/health-science/white-house-set-to-adopt-sweeping-curbs-on-carbon-pollution/2015/08/01/ba6627fa-385c-11e5-b673-1df005a0fb28_story.html.

⁸⁴ Muyskens, Keating, & Granados, *supra* note 82.

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ 42 U.S.C. § 7412(b). See *Mercury and health*, WORLD HEALTH ORGANIZATION, (Mar. 2017), <http://www.who.int/mediacentre/factsheets/fs361/en/>. (“Elemental and methylmercury are toxic to the central and peripheral nervous systems. The inhalation of mercury vapor can produce harmful effects on the nervous, digestive and immune systems, lungs and kidneys, and may be fatal. The inorganic salts of mercury are corrosive to the skin, eyes and gastrointestinal tract, and may induce kidney toxicity if ingested. . . . There are

Section 112 of the Clean Air Act, and then doubled down on the emission of mercury through promulgation of rules under its Mercury Air Toxic Standards.

Due to the cost of regulation-mandated controls and the decreasing price of competitive fuels, the deployment of coal has been rapidly decreasing since 2010, so that it now supplies barely one-third of U.S. power.⁹⁰ Five years ago, at the end of 2012 there were a total of 1,308 coal-fired generating units in the United States, totaling 310 GW of capacity. 10.2 GW of which was coal-fired capacity that was retired in 2012, and more coal capacity has been retired each year since.⁹¹ Natural gas generation and renewable energy power-generating capacity have been supplanting coal generation in the last five years.⁹² Sixty gigawatts of existing coal-fired power generation capacity will be shuttered between 2015 and 2020, with 90 percent of this coal decrease already occurring by the end of 2016.”⁹³ U.S. coal-fired generating capacity is projected to decrease to 262 gigawatts in 2040, according to U.S. Energy Information Agency, which would constitute a 15 percent decrease.”⁹⁴

Next, this article examines the key Obama Administration MATS regulation, its impact, and how the Supreme Court came to find it in violation of federal law and remand it.

several ways to prevent adverse health effects, including promoting clean energy, stopping the use of mercury in gold mining, eliminating the mining of mercury and phasing out non-essential mercury-containing products. Promote the use of clean energy sources that do not burn coal. Burning coal for power and heat is a major source of mercury. Coal contains mercury and other hazardous air pollutants that are emitted when the coal is burned in coal-fired power plants, industrial boilers and household stoves.”)

⁹⁰ See Wendy Koch, *EPA Seeks 30% Cut in Power Plant Carbon Emissions by 2030*, USA TODAY (June, 3, 2014), <http://www.usatoday.com/story/money/business/2014/06/02/epa-proposes-sharp-cuts-power-plant-emissions/9859913/> (demonstrating decreased popularity of coal).

⁹¹ *AEO2014 Projects More Coal-Fired Power Plant Retirements by 2016 than Have Been Scheduled*, U.S. ENERGY INFO. ADMIN., <http://www.eia.gov/todayinenergy/detail.cfm?id=15031>.

⁹² See U.S. ENERGY INFO. ADMIN., *Natural Gas, Renewables Projected to Provide Larger Shares of Electricity Generation* (May 4, 2015), <http://www.eia.gov/todayinenergy/detail.cfm?id=21072> (demonstrating how natural gas and renewable energy have been replacing coal).

⁹³ Michael Bastasch, *Report: EPA Regulations to Accelerate Coal Plant Shutdowns*, THE DAILY CALLER (Feb. 14, 2014), <http://dailycaller.com/2014/02/14/report-epa-regulations-to-accelerate-coal-plant-shutdowns/>.

⁹⁴ *Id.*

B. Executive Branch Mercury Air Toxic Standards (MATS)

1. The Rule

Promulgated by EPA, the Mercury Air Toxic Standards (MATS) were estimated by EPA to “avert up to 11,000 premature deaths, 4,700 heart attacks, and 130,000 asthma attacks every year.”⁹⁵ The final rule set standards for all hazardous air pollutants emitted by coal and oil-fired electric generating units with a generation capacity of 25 megawatts or greater.⁹⁶ Promulgated pursuant to EPA’s authority under Section 111 of the Clean Air Act New Source Performance Standards program and the Clean Air Act Section 112 Hazardous Air Pollution (“HAPs”) provisions of the Clean Air Act,⁹⁷ MATS is specifically aimed at reducing power plants’ emissions of hazardous air pollutants, including arsenic, chromium, nickel, hydrochloric acid and hydrofluoric acid, in addition to mercury.⁹⁸

The rule provides existing electricity generators four years to come into compliance, with an additional year available to the power plants that FERC has deemed “reliability-critical,” i.e. essential to maintaining adequate power supply, voltage, and ancillary support for the nation’s bulk power system or restarting the electrical network in case of a blackout.⁹⁹ MATS further provides that if a source cannot come into compliance within the timeframe allowed, EPA will determine, on a case-by-case basis, whether and to what extent it will assess fines or penalties for noncompliance.¹⁰⁰

⁹⁵ ENVTL. PROT. AGENCY, *Healthier Americans*, <http://www3.epa.gov/mats/health.html>.

⁹⁶ ENVTL. PROT. AGENCY, *Basic Information*, <http://www.epa.gov/mats/basic.html>; 77 Fed. Reg. 9,304 (Feb. 16, 2012) (to be codified at 40 C.F.R. pts. 60 & 63). This affects larger coal plants, if coal is greater than 10 percent of fuel input, and the unit is greater than 25 Mw capacity, produces electricity for sale, and supplies more than one-third of its potential output to any utility power distribution system, unless its annual capacity factor is less than 8 percent of its capacity rating (i.e. only used for peaking purposes). See 77 Fed. Reg. at 9,309 (supporting air pollutant standards).

⁹⁷ Clean Air Act §§ 111, 112, 42 U.S.C. §§ 7411, 7412; 78 Fed. Reg. 24073, 24073 (April 24, 2013).

⁹⁸ U.S. ENVTL. PROT. AGENCY, *Fact Sheet: Mercury and Air Toxics Standards for Power Plants*, <http://www.epa.gov/mats/pdfs/20111221MATSSummaryfs.pdf>.

⁹⁹ *Id.* at 2.

¹⁰⁰ *Id.*

2. The Discretion to Consider Economics of MATS

EPA's MATS regulation was challenged by Michigan and twenty-two other states along with some industry stakeholders, arguing that the EPA in promulgating the rule did not consider cost.¹⁰¹ In *Michigan v. EPA*, petitioner stated and other industry stakeholders argued that the EPA's rules to control emission of mercury are unreasonable as the rule, according to EPA's calculations, will require coal-fired power plants to spend about \$9.6 billion with the direct benefit of only \$4 to 6 million from the reduction of the directly targeted mercury.¹⁰² This approximates a 1:2000 direct benefit:cost ratio. EPA countered that cost is irrelevant in making a Clean Air Act rule.¹⁰³ Whenever the statute is ambiguous, EPA's argument was that it could interpret and resolve the ambiguity reasonably within its discretion.¹⁰⁴

EPA argued that it did not do an analysis of regulation-related cost because the language of the Clean Air Act does not explicitly require EPA to consider cost if it finds a new regulation "appropriate and necessary" after reviewing the results of study requested by 42 U.S.C. 7412(n)(1)(A).¹⁰⁵ EPA argued that section 112(n)(1)(A) of the Clean Air Act does not mandate EPA to consider cost because the word "cost" does not appear in the Act, therefore without considering cost as a pre-requisite EPA can promulgate additional restrictive rules if it finds such action

¹⁰¹ *Michigan*, 135 S.Ct. at 2704.

¹⁰² *Id.* at 2705-06 (citing 77 Fed. Reg. 9326).

¹⁰³ *Id.* at 2706. See 76 Fed. Reg. 24988 (2011) ("We further interpret the term 'appropriate' to not allow for the consideration of costs."); 77 Fed. Reg. 9327 ("Cost does not have to be read into the definition of 'appropriate'").

¹⁰⁴ *Chevron*, 467 U.S. at 837 (providing that the Court should accept EPA's interpretation of the statutes while making rules, if EPA's interpretation is reasonable and permissible interpretation of the ambiguous language when Congress's intent behind the statute is unknown.).

¹⁰⁵ 42 U.S.C. § 7412(n)(1)(A) ("The Administrator shall perform a study of the hazards to public health reasonably anticipated to occur as a result of emissions by electric utility steam generating units of pollutants listed under subsection (b) of this section after imposition of the requirements of this chapter. The Administrator shall report the results of this study to the Congress within 3 years after November 15, 1990. The Administrator shall develop and describe in the Administrator's report to Congress alternative control strategies for emissions which may warrant regulation under this section. The Administrator shall regulate electric utility steam generating units under this section, if the Administrator finds such regulation is appropriate and necessary after considering the results of the study required by this subparagraph.").

“appropriate and necessary.”¹⁰⁶ In other words, EPA can regulate mercury from coal-fired power plants whenever it subjectively deems it “necessary.”¹⁰⁷ EPA also asserted that it is “appropriate” to further restrict mercury emissions because the technology is available and is in use by many power plants to reduce the emission of mercury.¹⁰⁸

Part of the EPA rationale is premised on the asserted ineffectiveness of prior EPA regulation. The EPA argued that the MATS rule was “necessary” because earlier regulation, particularly the EPA’s Cross-State Air Pollution Rule (CSAPR),¹⁰⁹ promulgated pursuant to other sections of Clean Air Act, did not deliver the anticipated reduction of emission of hazardous pollutants anticipated by the EPA, including mercury, and did not sufficiently reduce significant risk to public health.¹¹⁰

C. Challenge in the Lower Federal Courts

In 2014, the Court of Appeals for the D.C. Circuit upheld EPA’s MATS regulation.¹¹¹ What also made the rule controversial is that the EPA counted assumed co-benefits associated with ancillary PM_{2.5} reductions, which were not covered by the MATS rule which regulated only mercury and hazardous emissions, yet PM_{2.5} comprised the overwhelming majority of all ‘benefits’ attributed to the MATS regulations and counted by EPA.¹¹² PM_{2.5} is already otherwise regulated by the EPA under other sections of the Clean Air Act.¹¹³ This ancillary indirect “benefit” was not without design. The EPA designed the MATS rule, in part, to achieve through unilateral executive action PM_{2.5} emissions reductions that otherwise it could

¹⁰⁶ 77 Fed. Reg. 9326.

¹⁰⁷ *Michigan*, 135 S.Ct. at 2705.

¹⁰⁸ *Id.* at 2706; 77 Fed. Reg. 9363.

¹⁰⁹ See *infra* Section III(E).

¹¹⁰ 77 Fed. Reg. 9310-11.

¹¹¹ See generally *White Stallion Energy Ctr., LLC v. EPA*, 748 F.3d 1222 (D.C. Cir. 2014), *rev’d*, *Michigan*, 135 S. Ct. 2699.

¹¹² Susan E. Dudley, OMB’S Reported Benefits of Regulation: Too Good to be True?, REGULATORY REFORM 29 (2013), <http://object.cato.org/sites/cato.org/files/serials/files/regulation/2013/6/regulation-v36n2-4.pdf>.

¹¹³ See ENVTL. PROT. AGENCY, *Particulate Matter*, [http://www3.epa.gov/airquality/particle/pollution/\(Regulating PM_{2.5}\); White Stallion Energy Center LLC, et al. v. Environmental Protection Agency \(12-1100\)](http://www3.epa.gov/airquality/particle/pollution/(Regulating%20PM2.5);%20White%20Stallion%20Energy%20Center%20LLC,%20et%20al.%20v.%20Environmental%20Protection%20Agency%20(12-1100)), U.S. CHAMBER LITIGATION CENTER, <http://www.chamberlitigation.com/cases/white-stallion-energy-center-llc-et-al-v-environmental-protection-agency-epa-12-1100> (upholding Utility MACT).

not lawfully compel using provisions of the Act authorizing direct regulation of criteria pollutants, including PM_{2.5}.¹¹⁴

The Circuit Court of Appeals found that the MATS regulation was not arbitrary and capricious under the requirements of the Administrative Procedures Act because the EPA demonstrated a reasonable connection between its actions and the record of decision, and it was accorded *Chevron* deference to undertake actions.¹¹⁵ Judge Kavanaugh, concurring in part and dissenting in part in the Circuit opinion, took issue and agreed with the industry petitioners that the EPA unreasonably and illegally excluded cost considerations and economic impacts when determining whether the Clean Air Act Maximum Achievable Control Technology (MACT) regulation of mercury and other power plant hazardous air pollutants (HAPs) was “appropriate and necessary.”¹¹⁶

The NAAQS criteria pollutant standards for criteria pollutants in the statute specifically do not provide for considerations of cost, because the standard must be set by an ample margin of safety regardless of cost.¹¹⁷ By contrast, for MACT regulation of power plant hazardous air pollutants at issue in the MATS challenge, pursuant to §112(n)(1)(A) of the Clean Air Act, contains more flexible language for the EPA making “appropriate and necessary” regulation.¹¹⁸ When the D.C. Circuit Court upheld MATS

¹¹⁴ See *White Stallion*, *supra* note 113 (describing EPA re-designation of Clean Air Act).

¹¹⁵ *White Stallion Energy Ctr., LLC*, 748 F.3d at 1234.

¹¹⁶ *Id.* at 1261 (Kavanaugh, J., concurring in part and dissenting in part). The dissent by Judge Kavanaugh stated that the majority over-read the ruling in *Whitman v. American Trucking Association, Inc.*, by ignoring the important difference between how the Clean Air Act provisions govern NAAQS rulemaking compared to the MACT regulation of power plant HAPs. *Id.* at 1265–66 (Kavanaugh, J., concurring in part and dissenting in part). The *Whitman* majority held that the EPA may not take costs into consideration when setting NAAQS. *Whitman v. Am. Trucking Ass’n, Inc.*, 531 U.S. 457, 467 (2001).

¹¹⁷ 42 U.S.C. §§ 7408(a), 7409(b)(1). If an air pollutant is emitted by “numerous or diverse mobile stationary sources” and the associated air pollutant is “reasonably . . . anticipated to endanger public health or welfare,” then pursuant to §108(a) of the Clean Air Act, the EPA must establish NAAQS for those pollutants, and pursuant to §109(b) of the Act, those standards must be “requisite to protect public health” with “an adequate margin of safety.” 42 U.S.C. §§ 7408(a), 7409(b)(1).

¹¹⁸ *Id.* at § 7412(n)(1)(A). See *White Stallion Energy Ctr., LLC*, 748 F.3d at 1230–31 (reinforcing notion that language within statute is more flexible); *History*, ENVIRONMENTAL PROTECTION AGENCY, <http://www3.epa.gov/airquality/powerplanttoxics/history.html> (supporting flexible language related to regulation). This requires the EPA to study and issue a report on the public health hazards anticipated to occur as a result of power plant HAP emissions, and then apply MACT regulation “if” the Administrator finds

applying to existing coal- and oil-fired electric generating units, it relied in part upon Supreme Court precedent in *Whitman v. American Trucking Association*, establishing that the EPA is under no obligation to consider costs in establishing HAPS under other provisions of the Clean Air Act that similarly fail to mention cost as a relevant consideration.¹¹⁹ On that issue the appellate court split; however, the majority deferred to the EPA's technical judgment.¹²⁰

The power industry, the most capital-intensive in the United States,¹²¹ cannot turn on a dime. Over the four years while MATS moved through the courts, many coal-fired facilities, not knowing whether the challenged regulation would eventually be overturned, complied with the regulation that would later be stricken.¹²² Eventually, the rule was overturned and remanded by the Supreme Court¹²³ after many coal-fired power generators in the nation either complied or delisted their plants to shut down rather than comply.¹²⁴

such regulation is “appropriate and necessary,” which phrase is not defined. 42 U.S.C. §7412(n)(1)(A).

¹¹⁹ *White Stallion Energy Ctr., LLC*, 748 F.3d at 1238–39.

¹²⁰ *Id.* at 1239–40. This included challenges to the EPA's determination of what was achievable by the best performing 12 percent of sources (i.e., “the MACT floor”) and the supporting data. *Id.* at 1247–48.

¹²¹ EDISON ELECTRIC INST., *Delivering America's Energy Future*, (Feb. 8, 2017) http://www.eei.org/resourcesandmedia/industrydataanalysis/industryfinancialanalysis/Documents/Wall_Street_Briefing.pdf (indicating that EEI members invest \$120 billion in 2016 for capital investments in the electric power sector).

¹²² See Suzanne Goldenberg & Raya Jalabi, *US Supreme Court Strikes Down Obama's EPA Limits on Mercury Pollution*, THE GUARDIAN (June 29, 2015), <http://www.theguardian.com/environment/2015/jun/29/supreme-court-air-pollution-epa-coal-plants> (“According to data compiled by SNL Energy, many generators in the US complied with the mercury and toxics compliance, despite the possibility that the court would strike down the rule.”).

¹²³ See *Michigan*, 135 S. Ct. at 2712 (Overturning and remanding MATS).

¹²⁴ See Patrick Ambrosio, *Supreme Court Remands EPA Mercury Rule For Failing to Consider Cost to Power Plants*, BLOOMBERG BNA (June 30, 2015), <https://www.bna.com/supreme-court-remands-n17179928911/> (Coal-fired “Plants that were not granted an extension were required to comply with the standards by April 16, 2015, a deadline that required the installation of billions in pollution controls and factored into the closure of many coal-fired power plants. Representatives from American Electric Power, FirstEnergy Corp. and other utilities told Bloomberg BNA in April that a Supreme Court ruling against the EPA would come too late to alter plans to close plants or invest in pollution controls.”).

*D. The Elevation of Costs as a New Metric:
Supreme Court Decision*

This MATS circuit court decision proceeded to the Supreme Court on appeal by a coalition of more than 20 states.¹²⁵ In *Michigan v. EPA*, the petitioning parties overturned the EPA MATS regulation of mercury and other hazardous pollutants because:

EPA must consider cost—including cost of compliance—before deciding whether regulation is appropriate and necessary . . . One would not say that it is even rational, never mind ‘appropriate,’ to impose billions of dollars in economic costs in return for a few dollars in health or environmental benefits.¹²⁶

EPA claimed long-term benefits of \$37-90 billion annually, without providing any statistical basis or proof for its numerical determination. During oral arguments before the Supreme Court, several members of the Court were critical of EPA cost-benefit analysis which attributed most of these annual public health benefits to reduction of fine particulate matter and other pollutants which were not regulated under this MATS mercury standards, with only \$4 to 6 million in benefits resulting directly from reductions of the MATS-regulated hazardous air pollutants. The Supreme Court found that the application of “appropriate and necessary” must include considerations of cost.¹²⁷ The majority opinion of the Supreme Court concluded that “it is not rational, never mind ‘appropriate,’ to impose billions of dollars in economic costs in return for a few dollars in health or environmental benefits.”¹²⁸

¹²⁵ *Michigan*, 135 S. Ct. at 2705–06. The Court granted certiorari to, and consolidated three separate petitions filed by the Utility Air Regulatory Group, the National Mining Association and 23 states. *Id.* at 2706. Fifteen states supported the EPA’s MATS regulation before the Court. *See generally* Brief in Opposition, *Michigan*, 135 S. Ct. 2699, No. 14-46, 14-47, 14-49, (Oct. 15, 2014) (Appellate briefs from various states).

¹²⁶ *Michigan*, 135 S. Ct. at 2707 (relying on *Motor Vehicle Mfrs. Ass’n of United States, Inc. v. State Farm Mut. Automobile Ins. Co.*, 463 U.S. 29 (1983)) (providing that an agency cannot entirely ignore an important aspect of the problem Congress tasked it with considering).

¹²⁷ ARNOLD W. REITZE, *AIR POLLUTION CONTROL LAW: COMPLIANCE AND ENFORCEMENT* 190 (2001), at 191-97.

¹²⁸ Clean Air Act §§ 172(a) (2), (c), 42 U.S.C. §§ 7502(a)(2), (c).

The Supreme Court held that “[in] addition, ‘cost’ includes more than the expense of complying with regulations; any disadvantage could be termed a cost.”¹²⁹ EPA is required to “consider cost—including, most importantly, cost of compliance—before deciding whether regulation is appropriate and necessary.”¹³⁰ Of paramount importance, the Court refused any longer to defer to EPA concerning the mercury standards.

The Supreme Court did not uphold EPA’s rationale of its own complete disregard and ignorance of the cost of the MATS rule because it did not support that the rule is “appropriate and necessary.”¹³¹ The Court found that it will never be found “appropriate” if the return on the investment of billions of dollar is worth only a few million dollars in health benefit.¹³² Spending billions of dollars on one issue based on a rule which does not carefully consider the cost of the program would be a waste of useful resource; therefore any significant regulation may require the consideration of cost before the rule is promulgated.¹³³

Section 112(n)(1)(B) of the Clean Air Act, which applies to HAPs, requires the EPA to conduct a study to determine effects on health and environment from the emission of mercury from sources and consider the available technologies to control those emissions of mercury and their costs.¹³⁴ Because Congress required EPA to perform this study of mercury emission impact on health and environment, EPA could not persuasively argue that Section 112(n)(1)(B) of the Act allowed EPA to ignore cost in its broad exercise of administrative discretion under the *Chevron deference*

¹²⁹ *Michigan*, 135 S. Ct. at 2707.

¹³⁰ *Id.* at 2711.

¹³¹ *Id.* at 2707 (citing *State Farm*, 103 S.Ct. at 2862) (indicating that when the agency’s actions are arbitrary and capricious and not based on relevant factors).

¹³² *Id.*

¹³³ *Id.* at 2707-08 (citing *Energy Corp. v. Riverkeeper, Inc.*, 129 S.Ct. 1498 (2009)).

¹³⁴ See 42 U.S.C. § 7412(n)(1)(B) (“The Administrator shall conduct and transmit to the Congress not later than 4 years after the date of enactment of the Clean Air Act Amendments of 1990, a study of mercury emissions from electric utility steam generating units, municipal waste combustion units, and other sources, including area sources. Such study shall consider the rate and mass of such emissions, the health and environmental effects of such emissions, technologies which are available to control such emissions, and the costs of such technologies.”). When Congress references cost in section 112(n)(1)(B) and when EPA is regulating coal-fired power plants based on section 112(n)(1)(A), cost becomes a relevant factor in any rulemaking affecting coal-fired power plants based on section 112(n)(1). *Michigan*, 135 S.Ct. at 2708.

doctrine.¹³⁵ Although other sections of the Clean Air Act expressly do not require EPA to consider cost while regulating sources other than power plants;¹³⁶ it was found that EPA cannot ignore cost where Congress had intended the regulation of power plant emissions only when “appropriate and necessary.”¹³⁷

Under the Administrative Procedure Act, the administrative record, created or not created by the agency, matters. While promulgating mercury emission standards, though EPA did some study to estimate the cost to the industry, that study was not in the record or the foundation or reason for EPA’s rule for coal-fired power plant mercury emission restriction. Thus, in *Michigan v. EPA*, by a Supreme Court split 5-4 decision, the circuit court opinion upholding the original MATS regulation was held illegal and remanded to the D.C. Circuit for redetermination based on cost analysis.¹³⁸

¹³⁵ *Id.* Cf. *Whitman v. American Trucking Assns., Inc.*, 121 S.Ct. 903, 916 (2001) (providing that while interpreting provisions of the Clean Air Act to publish ambient air quality standards with “adequate margins of safety,” the phrase does not require EPA to consider cost at all, but rather set the value of emissions of health affecting pollutants to a reasonable level such that it reduces the risk to health.).

¹³⁶ *Michigan*, 135 S.Ct. at 2709-10. While the section of the Clean Air Act regulating sources other than power plants does not require cost to be considered as a factor and concentrates on the amount of pollution from the regulated source, a separate section in the Act regarding power plant regulation makes reference to the consideration of cost as one of the factors among many, such as effect of pollution on health and environment, makes cost an important relevant factor that EPA cannot ignore.

¹³⁷ *Id.* at 2710; 42 U.S.C. § 7412(n)(1)(B); 42 U.S.C. § 7412(c)(1); 42 U.S.C. § 7412(c)(3). Where EPA neither considered cost at all, “cost of compliance,” nor any findings from the EPA Regulatory Impact Analysis, none can play any role in EPA’s determination that electric generation units need to be regulated by a second, additional layer of rules, which render that MATS rule not “appropriate and necessary.” *Michigan*, 135 S. Ct. at 2711.

¹³⁸ *Id.* at 2709-26. The Court majority decided that the EPA cannot find the MATS Rule “appropriate and necessary” when EPA has, in its own words, not considered cost at all when it determined that regulation of coal-powered power plants is required. *Id.* at 2711. The majority uses the metaphor of the purchase of a Ferrari by a customer who decided that it is appropriate to buy a Ferrari—a luxury and expensive automobile—but only considers the cost at the time of upgrade of its “audio system.” *Id.* at 2709. EPA’s action is similar to such buyer, who without consideration of cost, decides that it is appropriate to additionally regulate coal-powered power plants and will later consider the cost at the time of setting the limits of emission. The majority noted that the determination of a regulation to be “appropriate” cannot be validly made in the absence of a threshold cost consideration. *Id.* at 2710-2711. The minority of the Court, however, interpreted the Clean Air Act § 112(n)(1)(A) “appropriate and necessary” finding by EPA to not necessarily require an EPA consideration of cost be the first step in the rule making process. *Id.* at 2724. The Court dissenters opine that the majority is at fault by ignoring the EPA’s act of finding that

And here, the devil is in the details: The Supreme Court did not require EPA to perform a formal benefit-cost analysis.¹³⁹ Rather the decision required the EPA to consider cost, without restricting the residual *Chevron* administrative deference as to how cost would be considered by EPA regarding power plants to be regulated by additional rules for mercury emissions.¹⁴⁰

Of note, in reaching its narrowly split decision in *Michigan*, the Supreme Court majority cited the dissent of Judge Kavanaugh in the D.C. Circuit decision in *White Stallion Energy Ctr. LLC v. EPA*,¹⁴¹ which on appeal became denominated as *Michigan v. EPA*.¹⁴² Judge Kavanaugh, as part of his confirmation process after nomination to the Supreme Court, expressly singled out his dissent in this case as one of the ten most important cases of his career, stating “the Supreme Court’s majority opinion agreed with and cited my dissent” in *Michigan v. EPA*.¹⁴³ These dynamics

benefits such as about 11,000 less pre-mature deaths per year and avoidance of many serious illnesses outweighs the cost of the regulation, after it has determined the regulation is “appropriate and necessary.” *Id.* at 2721. The dissent supports the EPA’s MATS rule because EPA, after deciding that regulation is required, has accounted for cost as part of the rule promulgation process setting the limits. EPA, based on its study, later concluded that the cost of the MATS regulation would be about \$10 billion a year, and then comparing it against various benefits, with timing and cost as a threshold determination not important. *Id.* The dissent does not agree with the majority that the basic cost analysis must be the first step and the prerequisite basis to find the regulation “appropriate and necessary.” *Id.* at 2724. The dissent is satisfied if cost is the last step after EPA categorizing the power plants and determining to regulate the sources of pollution, beyond the floor level, at more stringent standard. *Id.* at 2726.

¹³⁹ A cost-benefit analysis quantitatively assigns monetary value to each benefit as a result of the rule and then compares the total benefit against the total cost.

¹⁴⁰ *Michigan*, 135 S.Ct. at 2711. Though the majority of the Court remanded the case to the D.C. Circuit for appropriate action for EPA to consider cost before finalizing a MATS rule, MATS was not vacated. *Id.* at 2712. Justice Thomas’s concurring opinion notes that notwithstanding *Chevron* deference to the EPA to resolve statutory ambiguity if its interpretation is reasonable, it is the province of the court “to say what the law is” and not the agency. *Id.* at 2712. See *Marbury v. Madison*, 5 U.S. 137 (1803) (Standing for the proposition that it is the Court’s ultimate interpretive authority to “say what the law is”).

¹⁴¹ *White Stallion Energy Ctr., LLC v. EPA*, 748 F.3d 1222 (D.C. Cir. 2014), *rev’d*, *Michigan*, 135 S. Ct. 2699.

¹⁴² See *supra* note 116.

¹⁴³ **Fatima Hussein**, Kavanaugh Touts Court Loss Among His Highest Accomplishments, *Bloomberg Environment Reporter*, July 24, 2018 (“In my view, it was unreasonable—and therefore unlawful under the Administrative Procedure Act—for EPA not to consider the costs imposed by regulations in determining whether such regulations

take on larger context for the future longevity of *Michigan v. EPA*'s new direction in Constitutional and administrative law, given Judge Kavanaugh's recent nomination to serve on the Supreme Court and the importance he attributes to his dissenting decision.

*E. Prior Regulatory 'Benefit' Precedent in Context:
The SIP-CALL, CAIR, and CSAPR*

Three times over the past two decades, pursuant to the Clean Air Act, EPA has attempted to delineate the Act's "Good Neighbor Provision" to prevent upwind drifting pollution to other downwind states by identifying when upwind states "contribute significantly" to nonattainment downwind pollution. First, in 1998, EPA issued a rule known as the "NO_x SIP Call" which limited NO_x emissions in 23 upwind States to the extent that such emissions contributed to nonattainment of ozone standards in downwind States.¹⁴⁴ The D.C. Circuit Court upheld the NO_x SIP Call, specifically affirming EPA's use of costs to determine when an upwind state's contribution was "significan[t]" within the meaning of the Clean Air Act statute.¹⁴⁵

Second, the subsequent Clean Air Interstate Rule (CAIR), promulgated by EPA in 2005, required 27 upwind states to reduce or eliminate the impact of upwind sources of pollution on out-of-state downwind nonattainment of NAAQS for SO₂ and NO_x.¹⁴⁶ States comply by restricting fossil fuel-fired power plant emissions.¹⁴⁷ The D.C. Circuit struck this CAIR cap-and-trade regulation as "arbitrary and capricious . . . not

were 'appropriate and necessary All nine Justices agreed with my position that the statute requires consideration of costs.'").

¹⁴⁴ See NO_x SIP Call, 63 Fed. Reg. 57,356, 57,358 (Oct. 27, 1998) (to be codified at 40 C.F.R. pt. 51, 72, 75, 96) (Limiting NO_x emissions in upwind states).

¹⁴⁵ *Michigan*, 213 F.3d 663, 674-679 (2000).

¹⁴⁶ *North Carolina v. Env'tl. Prot. Agency*, 531 F.3d 896, 903 (D.C. Cir. 2008), *modified*, 550 F.3d 1176 (D.C. Cir. 2008). NO_x and SO₂ were reduced via the 1997 annual and 24-hour fine particle (PM_{2.5}) and 1997 8-hour ozone NAAQS. See U.S. ENVTL. PROT. AGENCY, *Fact Sheet: The Cross-State Air Pollution Rule: Reducing the Interstate Transport of Fine Particulate Matter and Ozone 3* (2011), <https://www.epa.gov/csapr/fact-sheet-cross-state-air-pollution-rule-reducing-interstate-transport-fine-particulate> (Reducing upwind state air pollution sources). CAIR was intended to reduce or eliminate the impact of upwind sources on attainment of particulate and ozone NAAQS in downwind states.

¹⁴⁷ THE WHITE HOUSE, CUTTING CARBON POLLUTION IN AMERICA (2013), <https://obamawhitehouse.archives.gov/sites/default/files/image/president27sclimateactionplan.pdf>.

otherwise in accordance with the law,” and “fundamentally flawed.”¹⁴⁸ The court also struck CAIR on procedural grounds, finding that the EPA failed to adequately explain how it determined state emissions budgets and to address provisions of the Clean Air Act that it was required to enforce independently.¹⁴⁹

Third, replacing the judicially-stricken CAIR, the Cross-State Air Pollution Rule (CSAPR) addressed interstate air transport of SO₂ and NO_x contributing to ground-level ozone and fine particle pollution.¹⁵⁰ CSAPR, also promulgated pursuant to the “Good Neighbor” provision of the Clean Air Act,¹⁵¹ requires 27 states in the eastern half of the country to significantly improve air quality by reducing power plant emissions that cross state lines and contribute to ground-level ozone and fine particle pollution.¹⁵² CSAPR focused, through addressing interstate pollution, on attainment and maintenance of the 1997 Ozone NAAQS, 1997 PM_{2.5} NAAQS, and 2006 PM_{2.5} NAAQS in reducing NO_x and SO₂.¹⁵³

The CSAPR rule is part of a suite of other state and federal rules that, together, would result in power plant emissions reductions of 73 percent for sulfur dioxide and 54 percent for nitrous oxide.¹⁵⁴ EPA estimates that if all affected power plants were in full compliance with CSAPR, “[a]pproximately 70 percent of the power generated from coal-fired power plants [in states covered by the rule would] come from units with state-of-the-art SO₂ controls,” and roughly 50 percent of that power would “come from units with state-of-the-art NO_x controls.”¹⁵⁵

After the second EPA step of the CAIR cap-and-trade rule was stricken in 2008 by the D.C. Circuit Court of Appeals,¹⁵⁶ the D.C. Circuit Court struck CSAPR because of its flawed method for determining the

¹⁴⁸ *North Carolina*, 531 F.3d at 906–08, 918, 929 (citations omitted).

¹⁴⁹ *Id.*

¹⁵⁰ *EME Homer City Generation L.P.*, 696 F.3d. 7 (D.C. Cir. 2012), *rev'd*, *U.S. EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584 (2014).

¹⁵¹ Clean Air Act § 110(a)(2)(D), 42 U.S.C. § 7410(a)(2)(D)); 76 Fed. Reg. 48,208, 48,216 (Aug. 8, 2011) (to be codified at 40 C.F.R. pt. 51).

¹⁵² U.S. ENVTL. PROT. AGENCY, *Fact Sheet: The Cross-State Air Pollution Rule: Reducing the Interstate Transport of Fine Particulate Matter and Ozone 1* (2011), <https://www.epa.gov/csapr/fact-sheet-cross-state-air-pollution-rule-reducing-interstate-transport-fine-particulate>.

¹⁵³ *Id.* at 3.

¹⁵⁴ *Id.* at 2.

¹⁵⁵ *Id.* at 4.

¹⁵⁶ 76 Fed. Reg. 48,208, 48,216 (Aug. 8, 2011) (to be codified at 40 C.F.R. pt. 51).

emission reduction obligation imposed on states.¹⁵⁷ On *certiorari*, EPA's CSAPR rule was subsequently upheld by the Supreme Court, overturning the D.C. Circuit.¹⁵⁸ The 6-2 opinion of the Supreme Court reversed the D.C. Circuit's holding in 2014, reaffirming deference to agency discretion in devising Clean Air Act regulations, and reinforcing *Chevron* precedent.¹⁵⁹

The majority's ruling of the Court rejected the D.C. Circuit and Supreme Court dissenting Justices' conclusions that EPA is foreclosed from relying on costs in making its determination, finding nothing in the statutory language that would preclude that cost consideration.¹⁶⁰ It also disagreed with the D.C. Circuit majority's conclusion that EPA was required to allocate responsibility for emissions reduction in a manner proportional to each state's contribution.¹⁶¹ "Nothing in the text of the Good Neighbor Provision propels EPA down this path."¹⁶² Additionally, considering the "combined and cumulative effect of each upwind State's reductions," the majority found that the D.C. Circuit's proportional-reduction approach was neither practical nor mathematically feasible, and would ultimately lead to costly and unnecessary over-regulation.¹⁶³

Regarding cross-state pollution covered by CSAPR,¹⁶⁴ the Supreme Court allowed EPA, in *EPA v. EME Homer City Generation, L.P.*,¹⁶⁵ to perform "a cost-effective allocation of emissions reduction

¹⁵⁷ *EME Homer City Generation, L.P.*, 696 F.3d at 15-19 (D.C. Cir. 2012), *rev'd*, *Env'tl. Prot. Agency v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584 (2014).

¹⁵⁸ *EME Homer City Generation, L.P.*, 134 S. Ct. at 1596 (citing *Chevron*, 467 U. S. 837) (indicating that the EPA scheme for interstate cross-state pollution was "sensible," "equitable," "efficient" and "making good sense[.]"). The majority opinion included two key holdings: First, it held that the Clean Air Act does not require the EPA to provide upwind states a second opportunity to file a State Implementation Plan allocating in-state emissions before issuing a Federal Implementation Plan. *Id.* Second, the EPA's Transport Rule, which allocates emission reductions based on cost effectiveness as opposed to the upwind States' proportional contributions to downwind states' pollution, was a reasonable interpretation of the Good Neighbor Provision of the Act and therefore entitled to *Chevron* deference. *Id.* at 1602-1610.

¹⁵⁹ *Id.* (citing *Chevron U.*, 467 U.S. 837).

¹⁶⁰ *Id.*

¹⁶¹ *Id.* at 1605.

¹⁶² *Id.*

¹⁶³ *Id.* at 1604-06.

¹⁶⁴ Clean Air Act, §§ 110(a)(2)(D), 126, 42 U.S.C. §§ 7410(a)(2)(D), 7426. The Act also establishes interstate transport commissions, and gives the EPA direct authority to order individual stationary sources to reduce emissions if they significantly contribute to non-attainment in another state. Clean Air Act § 176A, 42 U.S.C. § 7506a.

¹⁶⁵ *EME Homer City Generation, L.P.*, 531 U.S. 457.

responsibilities.”¹⁶⁶ The Supreme Court decision in *EME Homer* contravenes the ruling in *Whitman v. American Trucking Ass’n, Inc.*, which ruled against taking cost into consideration when establishing air standards.¹⁶⁷ “The CAA [Clean Air Act] as a whole unambiguously bars cost considerations from the NAAQS-setting process.”¹⁶⁸ This applied to a different part of the Act which had the requirement to set a standard with an “adequate margin of safety.” The Supreme Court overruled the District of Columbia Circuit’s decision, which asserted that the Act’s standard had no “intelligible principle” to help the EPA in establishing the NAAQS.¹⁶⁹

Based on the inconsistent and somewhat limited success between 1998 – 2014 with these other three Clean Air Act regulations limiting power plant emissions, EPA promulgated its MATS rule which was estimated to have approximately \$9.6 billion in costs annually versus a direct hazardous pollutant public benefit of \$4-5 million annually.¹⁷⁰ Based on this modest *direct* benefit metric, the costs of complying with the regulation was somewhere between 1,600 - 2,400 times more than direct benefits of reducing hazardous power plant air pollution.

IV. THE ‘NEW’ MATH: WHICH COSTS COUNT WHEN THE COURT ELEVATES COST AS A NEW PRUDENTIAL RULE?

Though EPA stated in *Michigan v. EPA* that it did not consider cost on the record while reaching its conclusion that regulation of coal-fired power plants of capacity more than 25 MW is “appropriate and necessary,”¹⁷¹ EPA, in fact, conducted a non-record study to find out the cost of the proposed MATS rule. The study concluded that the available health benefits, including fewer mercury-related IQ loss in development of

¹⁶⁶ Adler, *supra* note 59, at 172-74.

¹⁶⁷ *Am. Trucking Ass’n v. EPA*, 121 S. Ct. 903, 908 (2001). The courts have noted that costs can be considered in formulating the SIPs that implement and maintain NAAQS. *See, e.g.*, Adler, *supra* note 59, at 173-74 (highlighting cost benefit analysis for agricultural pesticides).

¹⁶⁸ *Am. Trucking Ass’ns v. EPA*, 175 F.3d 1027, 1033–34, 1038 (D.C. Cir. 1999).

¹⁶⁹ Elena Kagan, *Presidential Administration*, 114 HARV. L. REV. 2245, 2364 (2001). *See American Trucking Ass’n v. EPA*, 175 F.3d 1027, 1034 (D.C. Cir. 1999), *reh’g granted in part and denied in part*, 195 F.3d 4 (D.C. Cir. 1999) (asserting that the Clean Air Act had no “intelligible principle” to help the EPA establish NAAQs).

¹⁷⁰ *Michigan*, 135 S. Ct. at 2705-06.

¹⁷¹ *See id.* at 2707, 2712 (Supporting notion that EPA did not consider cost when reaching conclusions about coal power plants).

children, avoidance of premature death of 4200-11,000 persons per year, reduced incidences of non-fatal heart attacks, reduced hospitalizations from cardiovascular and respiratory problems, and hundreds of thousands of lost productive work days, outweighed the substantial ongoing cost of almost \$10 billion per year for compliance.¹⁷² The EPA did the numbers, but did not change its regulatory position: On remand, EPA evaluated cost metrics, considered public comments, and made findings that EPA's regulation of power plants under MATS is justified.¹⁷³

Presenting those numbers did not change what some saw as an imbalanced outcome: In its final Regulatory Impact Analysis (RIA) for the MATS rule, EPA noted that the cost of the program is about \$9.6 billion a year while the total direct *and* indirect benefits and ancillary co-benefits (from reduction of sulfur dioxide, nitrogen oxides, and particulate matter that were not the subject of the MATS regulation), is about \$37 - \$90 billion per year.¹⁷⁴ Almost all of the total benefits are from indirect so-called co-benefits totally unrelated to the regulated mercury chemical. In order to reduce mercury, operation of high-emission coal-fired power plants is suppressed by the MATS regulation, which also reduces emission of other pollutants. However, opponents of the rule claimed that EPA's consideration of any co-benefit is faulty because this is double counting of

¹⁷² 77 Fed. Reg. 9304, 9306 (Feb. 16, 2012) (to be codified at 7 C.F.R. pt. 60, 63). Table 2 (Summary of the Monetized Benefits, Social Costs, and Net Benefits for the Final Rule in 2016) provides the following:

	[Billions of 2007 \$]	
	3% Discount rate	7% Discount rate
Total Monetized Benefits	\$37 to \$90	\$33 to \$81.
Partial Hg-related Benefits	\$0.004 to \$0.006	\$0.0005 to \$0.001.
PM ^{2.5} -related Co-benefits	\$36 to \$89	\$33 to \$80.
Climate-related Co-Benefits	\$0.36	\$0.36.
Total Social Costs	\$9.6	\$9.6.
Net Benefits	\$27 to \$80	\$24 to \$71.

¹⁷³ U.S. ENVTL. PROT. AGENCY, *Fact Sheet, Final Consideration Of Cost In The Appropriate Necessary Finding For The Mercury And Air Toxics Standards For Power Plants* (2016), https://www.epa.gov/sites/production/files/2016-05/documents/20160414_mats_ff_fr_fs.pdf.

¹⁷⁴ U.S. ENVTL. PROT. AGENCY, REGULATORY IMPACT ANALYSIS FOR THE FINAL MERCURY AND AIR TOXIC STANDARDS ES-1 (2011).

indirect benefits with the actual direct benefits from what the rule expressly addresses.¹⁷⁵

A. Agency Choice of Cost-Benefit Analysis

EPA's initial study for cost analysis for setting the MATS rule was not without controversy.¹⁷⁶ As noted by the U.S. Government Accountability Office, EPA did not analyze all the options consistently or provide an estimate of total cost and benefit from each possible option.¹⁷⁷ On the cost side of the ledger, EPA analyzed annual cost and benefit of the cap-and-trade program along with Clean Air Interstate Rule, but it did not compare technology-based options in combination with the Interstate Rule.¹⁷⁸ EPA considered technology-based options separately for annual cost and benefit calculations, but did not consider cap-and-trade options separately.¹⁷⁹

On the benefit side of the ledger, EPA did not log the value of health benefits as a direct result of a reduction in mercury, or and how changes in the reduced mercury emissions will change the cost-benefit ratio for the technology-based options.¹⁸⁰ The vast majority of the benefits that EPA counted were from reduction from particulate matter and unrelated to the mercury which was being regulated by the rule.¹⁸¹ EPA did not consider some of the key uncertainties affecting its cost-benefit analysis.¹⁸² After remand in *Michigan v. EPA*, reviewing public comments both in favor and against the MATS rule, EPA conducted cost analysis based on four different metrics, and calculated that direct mercury benefits plus indirect

¹⁷⁵ *IER President Releases Statement on New EPA Regs*, INSTITUTE FOR ENERGY RESEARCH (Dec. 21, 2011), <http://instituteforenergyresearch.org/press/ier-president-statement-on-new-epa-regs/>.

¹⁷⁶ U.S. GOV'T ACCOUNTABILITY OFFICE, *CLEAN AIR ACT: OBSERVATIONS ON EPA'S COST-BENEFIT ANALYSIS OF ITS MERCURY CONTROL OPTIONS* (Feb. 2005), <http://www.gao.gov/new.items/d05252.pdf>.

¹⁷⁷ *Id.* at 8-9.

¹⁷⁸ *Id.* at 8.

¹⁷⁹ *Id.* at 8. Cf. Ted Gayer & Robert Hahn, *The Political Economy of Mercury Regulation*, REGULATION, 2005, at 26, https://www.aei.org/wp-content/uploads/2011/10/20050708_MercuryRegulation.pdf (Explaining technology-based options for cost-benefit calculations).

¹⁸⁰ U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 176 at 12-13.

¹⁸¹ *Id.* at 4.

¹⁸² *Id.* at 14.

co-benefits still outweighed the cost, concluding that the MATS rule is “appropriate and necessary.”¹⁸³

Mercury is listed as a Hazardous Air Pollutant in the Clean Air Act Section 112(b)(1).¹⁸⁴ EPA proposed two options to control the emission of mercury from coal-fired power plants, which are the most significant source of mercury pollution.¹⁸⁵ One of the options is the application of control technology, while the other is participation in a cap-and-trade option.¹⁸⁶ However, EPA evaluated technology-based options alone, while the cost-benefit for the cap-and-trade program was examined with the separate Interstate Rule.¹⁸⁷

EPA estimated the cost of the technology-based options at approximately \$2 billion per year with benefits of about \$15 billion a year.¹⁸⁸ Cost-benefit from the cap-and-trade plus Interstate Rule was \$3 to 5 billion per-year cost and \$58-73 billion a year of benefits.¹⁸⁹ Because the cost-benefit from the cap-and-trade option was considered along with the Interstate Rule, it does not help others to choose the correct option between the two available options—technology-based or cap-and-trade.¹⁹⁰

B. *The Algorithm: Dissecting Math*

Historically, EPA focused on percentage mercury reduction targets. EPA, in January 2004, had proposed a technology-based option to reduce the mercury emissions from coal-fired power plants by about 30% from the then-current 48 tons per year, to achieve a reduction to 34 tons per year by 2008.¹⁹¹ In addition, EPA enacted the Clean Air Interstate Rule to reduce emissions of nitrogen oxides and sulfur dioxide, which also indirectly

¹⁸³ 81 Fed. Reg. 24,420, 24,422 (Apr. 25, 2016) (to be codified at 40 C.F.R. pt. 63), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20568&disposition=attachment&contentType=pdf>.

¹⁸⁴ Clean Air Act, 42 U.S.C.A. § 7412 §(b)(1); Alexander F. Gruss, Mercury Removal from Simulated Coal-Fired Power Plant Flue Gas Using UV Irradiation and Silica-Titania Composites 11-12 (2011) (unpublished Ph.D. dissertation, University of Florida) (on file with the University of Florida), <http://ufdc.ufl.edu/UFE0043294/00001>.

¹⁸⁵ U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 176 at 1.

¹⁸⁶ *Id.*

¹⁸⁷ *Id.* at 8.

¹⁸⁸ *Id.*

¹⁸⁹ *Id.*

¹⁹⁰ *Id.* at 9.

¹⁹¹ U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 176 at 6.

reduced mercury emissions to 34 tons per year by 2010.¹⁹² CAIR employs a cap-and-trade system to reduce nitrogen oxides and sulfur dioxide by 70 percent.¹⁹³

A clear comparison of costs was controversial. Since the reduction of mercury from the technology-based option and the Interstate Rule previously calculated by EPA is in the same range and EPA's flawed study of both the options--not considering the technology-based option with the Interstate Rule and not considering cap-and-trade option alone—make comparison difficult.¹⁹⁴ EPA also did not calculate economic benefits of mercury reduction alone.¹⁹⁵ Because the direct benefits from toxic mercury were not estimated and all the benefits which EPA calculated and relied on to find the MATS rule “appropriate and necessary” were from the indirect reduction of the co-benefit non-toxic criteria pollutants of nitrogen oxides, sulfur dioxides, and particulate matter as co-benefits, opponents alleged double-counting of co-benefits by EPA in disguise.¹⁹⁶ Opponents of the MATs rule argued that EPA's unconventional counting likely exaggerated the benefits.

1. Metrics and Cost: Agency and Stakeholder Arguments

Back to the drawing board in present tense. EPA did an evaluation of the cost of the MATs rule based on four different metrics.¹⁹⁷ The EPA first considered cost based on historical annual revenue and second based

¹⁹² *Id.* at 7

¹⁹³ *Regulations: Clean Air Interstate Rule (CAIR)*, MARSULEX ENVTL TECH., <http://www.met.net/clean-air-interstate-rule.aspx>.

¹⁹⁴ U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 176 at 8-9.

¹⁹⁵ *Id.* at 12.

¹⁹⁶ *See Michigan v. EPA: Costs and Benefits Matter*, U.S. SENATE (July 9, 2015), <https://www.rpc.senate.gov/policy-papers/michigan-v-epa-costs-and-benefits-matter> (explaining how opponents can use the case to argue that a federal court should delay implementation of the CO₂ rule until all legal proceedings are complete). Chief Justice Roberts, with the majority, questioned the “dramatic disparity” between MATS compliance cost which EPA projected to be \$9.6 billion dollars and any benefits due to the reduction in mercury and HAPs in the range of \$4 to \$6 million per year. *Id.* The majority of the benefits are ancillary co-benefits as a result of reduction in criteria air pollutants. With no meaningful benefit from HAP control, it is a question “whether it’s an illegitimate way of avoiding the different limitations.” *Id.*

¹⁹⁷ 80 Fed. Reg. 75, 025 (Dec. 1, 2015) (to be codified at 40 C.F.R. pt. 63), <https://www.regulations.gov/document?D=EPA-HQ-OAR-2009-0234-20497>.

on annual capital expenditure of the power plant industry.¹⁹⁸ Third, EPA reviewed the impact of the rule on retail electricity prices, and fourth, considered any adverse impact on the power industry.¹⁹⁹ EPA concluded that under each metric, the cost of mercury control is reasonable, and thereunder the power industry would be able to maintain its normal operation.²⁰⁰ EPA claimed that it did not receive any information that contradicts its finding of the cost to the program.²⁰¹

EPA noted that the MATS rule assists in the “prompt, permanent, and ongoing reductions in hazardous air pollutants” and the associated unquantified advantages to the “most exposed and most sensitive members of society” outweighs the cost.²⁰² The EPA also conducted a formal benefit-cost analysis for regulatory impact analysis (RIA) and compared the cost against total direct plus co-benefits (monetized and non-monetized) to find that total benefits including adding in all co-benefits are substantial and outweigh the costs.²⁰³ EPA estimated that the compliance cost of the MATS rule is approximately \$9.6 billion per year.²⁰⁴

¹⁹⁸ *Id.* at 75,032-34.

¹⁹⁹ *Id.* at 75,035-36.

²⁰⁰ *Id.* at 75,036.

²⁰¹ *Id.* at 75,035.

²⁰² *Id.* at 75,030.

²⁰³ 80 Fed. Reg. 75, 025, *supra* note 197, at 75,039, 75,041. For formal Benefit-Cost Analysis, EPA in its economics analysis attempts to quantify all significant benefits derived from the action in monetary terms to determine whether the “action increases cost-effectiveness.” *Id.* The program is cost-effective if Willingness-To-Pay for an action by the people benefitting from the program exceeds Willingness-To-Pay to avoid the action by the people disadvantaged by the program. *Id.* By monetizing, i.e. assigning, a dollar value to each consequence, if the benefit exceeds cost, it improves economic efficiency. *Id.* OMB Guidelines and Executive Orders instruct agencies to consider both monetized and non-monetized benefits. *Id.*; U.S. ENVTL. PROT. AGENCY, *Fact Sheet, Guidelines for Preparing Economic Analyses*, EPA-240-R-10-001 (Dec. 17, 2010), [http://yosemite.epa.gov/ee/epa/erm.nsf/vwAN/EE-0568-50.pdf/\\$file/EE-0568-50.pdf](http://yosemite.epa.gov/ee/epa/erm.nsf/vwAN/EE-0568-50.pdf/$file/EE-0568-50.pdf).

²⁰⁴ See U.S. ENVTL. PROT. AGENCY, *Mats Base Case*, https://www.epa.gov/sites/production/files/2015-08/mats_base_case_0.zip [hereinafter *MATS Base Case zip files*] (quantifying base case cost of rule); IPM Analysis of the Final Mercury and Air Toxics Standards (MATS), U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/airmarkets/ipm-analysis-final-mercury-and-air-toxics-standards-mats> [hereinafter *MATS Base Case excel files*] (comparing Base case model run, including the national Title IV SO₂ cap and trade program, NO_x State Implementation Plan (SIP) Call regional ozone season cap and trade program, Cross-State Air Pollution Rule (CSAPR), and settlements and state rules through December 2010 impacting SO₂, NO_x, and directly emitted PM, and CO₂, to results with MATs in place). EPA analyzed the impact of MATS on the U.S. electric power generation industry and followed version 4.10_MATS of the Integrated Planning Model

In response to the cost estimate, the electric power and the coal industries did not dispute the EPA cost.²⁰⁵ The Electric Reliability Coordinating Council (ERCC),²⁰⁶ Murray Energy Corporation which had

(IPM) to compare the difference of the annual cost to the power industry with and without the MATS Rule with all costs and prices expressed in 2007-year dollars. *MATS Base Case zip files, supra* note 204, at mats_base_case_0.zip, mats_policy_Case_0.zip; *MATS Base Case excel files, supra* note 204, at MATS_Base_case.xls, MATS Policy Case.xls. The MATs Base Case IPM includes in its determination of what criteria pollutant levels would be in the base case without MATS, the legal effect of the the Clean Air Act's Title IV sulfur dioxide cap-and-trade program, nitrogen oxide State Implementation Plan (SIP Call) regional ozone season cap-and-trade program, the Cross-State Air Pollution Rule (CSAPR) as finalized in July 2011, and settlements and state rules through December 2010 impacting emissions of sulfur dioxide, nitrogen oxide, directly emitted particulate matter, and carbon dioxide. *MATS Base Case zip files, supra* note 204, at mats_base_case_0.zip, mats_policy_Case_0.zip. According to the result of EPA's IPM data run, the total cost to the power industry without the MATs rule is \$144.25 billion in 2015, \$155.32 billion in 2020, and \$201.35 billion in 2030. *Id.* With the MATs rule in place, the cost to the power generator industry is \$153.63 billion in 2015, \$163.96 billion in 2020, and \$208.74 billion in 2030. *Id.* The difference in cost with and without MATs in force was approximately \$9.6 billion in 2015. EPA clarified that the annual \$9.6 billion dollars required consists of annual production and capital costs to the power industry for the year 2015, and this represents the largest decrease of total annual output and capital cost of \$31.8 billion dollars to the most significant increase of total of annual output and capital cost of \$32.9 billion dollars. 81 Fed. Reg. 24,431, 24,433 (Apr. 25, 2016) (to be codified at 40 C.F.R. pt. 63).

²⁰⁵ See NERA Economic Consulting, *Energy and Consumer Impacts of EPA's Clean Power Plan* (Nov. 7, 2015), <http://www.americaspower.org/wp-content/uploads/2015/11/NERA-CPP-Final-Nov-7.pdf> (providing overview of Clean Power Plan impacts). NERA's analysis projects that EPA's Clean Power Plan will cost consumers and businesses as much as \$39 billion a year, far outpacing the costs of compliance for all EPA rules for power plants in 2010 (\$7 billion) and the annual cost of the Mercury and Air Toxics Standards rule (\$10 billion). *Id.* See BLAIR BEASLEY, ET AL., *MERCURY AND AIR TOXIC STANDARDS ANALYSIS DECONSTRUCTED: CHANGING ASSUMPTIONS, CHANGING RESULTS* (Apr. 2013), <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-13-10.pdf> (demonstrating that actual regulations are more flexible than most models, which leads to a smaller impact on the electricity generating fleet).

²⁰⁶ Jeff Holmstead, counsel to the Electric Reliability Coordinating Council (ERCC), testified before U.S. Senate Committee on Environment and Public Works, Subcommittee on Clear Air and Nuclear Safety, on April 17, 2012, that "EPA itself estimates that the cost will be roughly \$10 billion a year, but many experts believe the actual cost will be significantly higher." Jeffrey R. Holmstead, Counsel, Electric Reliability Coordinating Council (ERCC), Review of Mercury Pollution's Impacts to Public Health and the Environment, Before the Subcommittee on Clear Air and Nuclear Safety (Apr. 17, 2012), http://www.epw.senate.gov/public/_cache/files/66318c87-2b64-4c85-9a57-c569c6b61a5a/41712hearingwitness testimonyholmstead.pdf.

been a significant challenger to several EPA rules,²⁰⁷ Duke Energy Corporation,²⁰⁸ and National Economic Research Association (NERA)²⁰⁹ all submitted that they thought the EPA cost was within the correct zone of value. Some emission control companies which sell pollution control technologies that would be required to be purchased pursuant to the MATS rule, predicted that the cost of compliance would be less than EPA's estimate due to the advancement of technology.²¹⁰

²⁰⁷ Letter from Gary M. Broadbent, Assistant General Counsel and Media Director, Murray Energy Corporation to Administrator McCarthy, Administrator, U.S. Environmental Protection Agency (Jan. 15, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234>

20536&attachmentNumber=1&disposition=attachment&contentType=pdf (“While \$9 billion averages only \$30 per person if that cost was evenly spread, you know that the costs will be very heavily concentrated on particular regions and communities.”).

²⁰⁸ Letter from J. Michael Geer, Manager of Environmental Programs, Duke Energy Business Services, to the Honorable Janet McCabe, Assistant Administrator for the Office of Air and Radiation, U.S. Environmental Protection Agency (Jan. 15, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20550&attachmentNumber=1&disposition=attachment&contentType=pdf>.

²⁰⁹ AMERICAN COALITION FOR CLEAN COAL ELECTRICITY, STATUS OF MAJOR EPA REGULATIONS AFFECTING COAL-FIRED ELECTRICITY GENERATION (2015), <http://www.americaspower.org/wp-content/uploads/2015/09/EPA-Regulations-January-2015.pdf>.

²¹⁰ See Brief of Emission Control Companies as Amici Curiae in Support of Respondents and in Support of Affirmance, *Michigan v. Env't Prot. Agency*, 135 S.Ct. 2699 (2015) (No. 14-46, 14-47, 14-49), http://www.americanbar.org/content/dam/aba/publications/supreme_court_preview/BriefsV5/14-46_amicus_resp_ecc.authcheckdam.pdf (predicting that costs of compliance will quickly decrease once the market responds to regulations with novel solutions). FirstEnergy, a utility, determined in 2013 that its compliance cost for the MATS rule was around \$465 million dollars across its entire generation fleet compared to its original estimate of \$2-\$3 billion. See *Power Companies' Declining Estimates of the Compliance Costs of the Mercury & Air Toxics Standards (MATS)*, MATS (2014), <http://blogs.edf.org/climate411/files/2014/05/Declining-costs-of-MATS-compliance.pdf> (“Annual operating expenses have been reduced through our continued focus on managing fuel costs and O&M expense. And more importantly, our projected capital spending in the generation group over the next several years has been reduced by more than \$1 billion through our recent actions. This includes additional reductions in our expected spend for compliance with Mercury and Air Toxics Standards, which is now at \$465 million across the entire generation fleet, with only an estimated \$240 million at our competitive units.”). American Electric Power, another utility, also predicted that it can reduce the compliance cost as a result of technology improvements. See *id.* (“During 2012 Q4 Earning Call, Nicholas K. Akins, CEO, AEP stated “We believe from a compliance standpoint that we can achieve further compliance reductions as a result of technology improvements, but also how we run the generation.”).

2. Absolute Cost

On one level, there is the issue of absolute costs to industry compared to an estimate of health and environmental benefits for the public. This is a comparison of economic expense and assumed health benefits. EPA's MATS rule's compliance cost is a "small fraction" of the annual revenue of the power industry.²¹¹ Resources For the Future (RFF) estimated that MATS compliance cost will result in the reduction of industry profit of about \$3-\$5 billion in the year 2020.²¹² EPA also compared the compliance cost to the power industry's annual capital expenditure during years 2000 through 2011, and found that the cost of MATS compliance is about 26 percent of this historic total annual capital expenditure of the power industry.²¹³

²¹¹ Revenue of the power industry from annual retail sales varies between \$277.2 billion in 2000 to \$356.6 billion in 2008, rendering the compliance cost only 2.7-3.5 percent of the annual electricity sales revenue from the year 2000 through 2011. See Supplemental Finding That It Is Appropriate and Necessary to Regulate Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units, 80 Fed. Reg. 75033, Table 2 (proposed Dec. 1, 2015) (demonstrating compliance cost of MATS rule). American Electric Power Company's revenue ranged between \$12.622-17.020 billion for years 2006 through 2015. See *American Electric Power Inc*, MORNINGSTAR (2017), <http://financials.morningstar.com/ratios/r.html?t=AEP>; Duke Energy is spending about \$525 to \$625 million dollars over the period of 10 years for MATS Rule compliance (supporting Duke Energy spending). See MATS, *supra* note 210 (emphasizing that its revenue ranged from \$12.720-\$24.598 billion for 2006 through 2015).

²¹² Dallas Burtraw et al., *Reliability in the Electricity Industry under New Environmental Regulations*, RESOURCES FOR THE FUTURE (May 2012), at 2, <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-12-18.pdf>.

²¹³ First Energy reported an estimated annual capital expenditure of \$1.315-3.312 billion over a decade spanning 2006 to 2015. See *FirstEnergy Corp*, MORNINGSTAR (2017), <http://financials.morningstar.com/ratios/r.html?t=FE> (First Energy projected it would cost about \$465 million for its entire generation fleet, reduced from its original estimate of \$925 million. However, the cost reduced due to the closure of plants rather than reduced costs of compliance, and focused effort on "managing fuel costs and O&M expense."). Murray Energy Corporation, a privately held corporation, claims that for the Sun Electric System, representing five electric utilities in the Southeast, compliance will cost \$12.5 billion, a 25% increase in the capital expenditure cost. See Broadbent *supra* note 207 (discussing how costs will be concentrated on particular regions and communities). Private sector power companies testified that subjecting power plants to Section 112 would "result in capital expenditures of something like \$12.5 billion for us, for a 25 percent rate increase . . . basically it triples the cost of compliance." See Energy Policy Implications of the Clean Air Act Amendments of 1989: Hearing Before the S. Comm. on Energy and Natural

EPA concluded that MATS compliance costs were reasonable as the incremental compliance cost of \$2.4 billion dollars in the year 2015 is “a small fraction – about 3.0 percent“ of the overall capital expenditure by the power industry.²¹⁴ RFF, based on the HAIKU electricity market model,²¹⁵ approximated an annual capital cost for incremental investments for pollution control of about \$5.1-\$5.4 billion by the year 2020.²¹⁶ RFF estimated that in the year 2020, the incremental spending on new generation system would reach a capital cost of \$25 billion without pollution control regulations such as MATS and CSAPR.²¹⁷

3. Derivative Regulatory Costs to Consumers

A state Attorney General commented that the purchase of electricity is not a “discretionary” expense, and therefore impact on the customers of a price increase is “an important aspect of the problem” requiring due analysis to meet the directive of the Supreme Court in *Michigan v. EPA*.²¹⁸

Resources, 101st Cong. 7, 234–35, 240–41, 436–37, 483, 485, 492, 570–72, 596, 603 (1990) (providing the bipartisan hearing featuring testimony on various bills).

²¹⁴ For an estimate of the annual capital expenditures of the power industry at \$120 billion annually, see *Delivering America’s Energy Future: Electric Power Industry Outlook*, EDISON ELECTRIC INST., Appendix A (Feb. 8, 2017), http://www.eei.org/resource/sandmedia/industrydataanalysis/industryfinancialanalysis/Documents/Wall_Street_Briefing.pdf.

²¹⁵ RFF’s HAIKU electricity model “simulates equilibrium in regional electricity markets and inter-regional electricity trade with an integrated algorithm for generation capacity investment and retirement and emissions control technology choice. The model has been used for a number of reports and articles that appear in the peer-reviewed literature . . . calculates electricity demand, electricity prices, the consumption of electricity supply, inter-regional electricity trading activity among 20 regions of the country, and emissions of key pollutants such as NO_x, SO₂, mercury and CO₂ from electricity generation.” *Maryland Regional Greenhouse Gas Initiative (RGGI)*, CENTER FOR INTEGRATIVE ENVIRONMENTAL RESEARCH (Aug. 4, 2011), http://cier.umd.edu/RGGI/modeling_details.html. See also Anthony Paul, *Haiku the RFF electricity market model* (Jan. 11, 2011), <http://cedmcenter.org/wp-content/uploads/2013/04/Paul.pdf> (PowerPoint on RFF electricity market model).

²¹⁶ Burtraw, *supra* note 212.

²¹⁷ *Id.* See also Supplemental Finding *supra* note 211, at Table 3 (listing total Capital Expenditures for the Electric Power, Generation, Transmission, and Distribution Sector, 2000 to 2011).

²¹⁸ Letter from Leslie Rutledge, Attorney General, State of Arkansas, to Gina McCarthy, Administrator, U.S. Environmental Protection Agency (Jan. 15, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20555&attachmentNumber=1&disposition=attachment&contentType=pdf>.

EPA considered changes in the resultant electricity rates billed to consumers.²¹⁹ EPA's MATS Regulatory Impact Analysis projected an increase in price of \$0.003/kwh or a 3.1 percent increase in average retail electricity costs.²²⁰ EPA noted historical electricity price fluctuations between \$-0.0013/kwh to \$0.0052/kwh for a period spanning the year 2000 through 2011.²²¹ Using this historic range, any increase in electricity rates the consumer is paying is projected to be within this traditional range of price fluctuation in recent years.²²² Over three-years of a MATS compliance period, EPA noted that the critical power generation reserve margin would be maintained as needed, and that demand for electricity would be unaffected while the power industry complies with the MATS rule.²²³

RFF estimated a rise of about 1 percent in the national average electricity prices as a result of required MATS compliance costs, and no net impact on electricity prices from compliance with the CASPR rules.²²⁴ RFF predicted that in regions where electricity is sold competitively, in about one-quarter of the states, there would be no change in the electricity prices due to the MATS rule and a decline in Clean Air Act Title IV sulfur dioxide allowances.²²⁵ In other areas characterizing the majority of states with traditional cost-of-service regulation, RFF estimated a price increase of about 2.5 percent, from \$83/MWh to \$85/MWh in the cost of retail electricity.²²⁶

²¹⁹ Supplemental Finding, *supra* note 211.

²²⁰ *Id.*

²²¹ *Id.* at Table 4.

²²² *Id.*

²²³ *Regulatory Impact Analysis for Final Mercury and Air Toxic Standards*, U.S. ENVTL. PROT. AGENCY (Dec. 2011), at 26, <https://www3.epa.gov/ttnecas1/regdata/RIAs/matsr/iafinal.pdf>.

²²⁴ RFF infers that "forcing coal units to comply with the MATS SO₂ standard or requiring SCR retrofits also decreases coal generation because of the retirement of coal-fired capacity," but the reduction in electricity generation from coal is made up almost entirely by increased natural gas generation. Burtraw, *supra* note 212, at Figure 1.

²²⁵ *Id.*

²²⁶ Calpine Corporation, Exelon Corporation, and Public Service Enterprise Group, Inc. also supported the EPA's estimated price change due to MATS is well within the price differences over the last many years. *Id.* "Actual data available in the years since EPA reaffirmed the Finding in 2011 support EPA's conclusion about the reasonableness of projected retail impacts. Annual electricity price data are available from the EIA through 2014. The average retail electricity price was 9.33 cents/kWh in 2011, 9.04 cents/kWh in 2012, 9.10 cents/kWh in 2013, and 9.28 cents/kWh in 2014. Thus, the net change in average retail electricity price from 2011 to 2014 was a *decrease* of 0.05 cents/kWh, even

National Economic Research Associates (NERA) modeled impacts of MATS and CSAPR together and found that increase in electricity prices would be 11.5%, while “heavy manufacturing states” like Ohio could face from MATS an increase in retail price up to approximately 23%.²²⁷ EPA was criticized for not disaggregating the retail price of electricity price fluctuation data at a “smaller scale than nationally” in order to display some out-of-norm regional data.²²⁸ The Utility Air Regulatory Group (UARG) contended that the projected price increase of \$0.003/kwh is double the average price increase for the eleven year period over which EPA collected retail pricing data – \$0.0016/kwh.²²⁹

Price increase due to the MATS rule, when added to the average standard price increase, was contended to be “far out of line with prior increases.”²³⁰ UARG claimed that power generators retired because of the MATS rule are ten times the amount that EPA estimated.²³¹ UARG contended that EPA’s comparison of the retirement of “coal-fired generation capacity” is arbitrary because each coal-fired power plant serves a unique purpose for the grid and EPA failed to include location as a factor affecting reliability and retirement of power generators.²³²

4. Disputed Costs

EPA stated in a Supplemental Finding issued in December 2015 that “no commenter provided any evidence or information that convinced the EPA that the preferred approach to consideration of cost is inadequate or

while many sources were incurring costs to comply with MATS. Moreover, the year-to-year changes from 2011 to 2014 – a decrease of 0.29 cents kW/h in 2012, then increases of 0.06 and 0.18 cents/kWh – were all well within the range seen in the prior decade. Thus, these more recent data also show that a 0.3 cents/kWh increase in electricity prices remains within the historical range of year-to-year variations and is reasonable.” *Id.*

²²⁷ Letter from Paul A. Yost, Vice President of Energy and Resources Policy, National Association of Manufacturers, to the U.S. Environmental Protection Agency (Aug. 4, 2011), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-17640&attachmentNumber=1&disposition=attachment&contentType=pdf> (citing a report by NERA, which approximates the cost of compliance to be approximately \$18 billion for MATS and CSAPR together, and the increase in electricity price to be about 11.5 percent).

²²⁸ Burtraw, *supra* note 212, at 18.

²²⁹ *Id.* (citing data available in Supplemental Finding, *supra* note 211).

²³⁰ *Id.*

²³¹ *Id.*

²³² *Id.*

unreasonable.”²³³ Of note, Murray Energy Corporation (“Murray”), in its formal comments to EPA, listed multiple factors which EPA did not consider in finding the cost of the regulation was reasonable: This included omission of costs imposed on state, local, and tribal governments, impact of cost on particular regions, sectors, and entities, impact on dislocated workers from closure of old and small-capacity power plants, and the unique nature and characteristics of the power plant industry.²³⁴ Murray claimed that EPA, while considering cost under section 112(n)(1)(A) of the Clean Air Act, omitted any consideration of the cost under section 112(f) of the Act.²³⁵ Murray based this argument on the *Michigan* Court’s explicit order to EPA to consider the cost of compliance, which Murray asserted includes any potential cost of compliance with section 112(f) of the Act in 2020: Murray asserted that ignoring the cost of compliance in 2020, per section 112(f), is “the same reversible error” which led to the Supreme Court reversal in *Michigan v. EPA*.²³⁶

Murray also alleged that EPA failed to consider the impact on state and local government public utilities providing public power.²³⁷ Murray commented that the *Michigan* Court required EPA to act reasonably²³⁸ to “prepare and consider estimates of the budgetary impact of regulations containing Federal mandates upon State, local, and tribal governments ... before adopting such regulations, and ensuring that small governments are given special consideration in that process.”²³⁹ EPA countered these

²³³ Supplemental Finding, *supra* note 211, at 34.

²³⁴ Broadbent, *supra* note 207.

²³⁵ *Id.*

²³⁶ *Id.*

²³⁷ *Id.*

²³⁸ See *Michigan*, 135 S.Ct. at 2708 (holding that the EPA acted unreasonably when it did not include cost consideration in its decision to regulate power plants).

²³⁹ The increased cost will force local governments to raise local property taxes, and reduction in essential services will affect the real estate industry. Thus, while considering alleged health hazards and substantial potential reductions in HAPs, compliance costs, and “costs of mercury controls developed under the Mercury Study, costs of other HAPs controls, and the Acid Rain Program costs” and ignoring other factors, EPA’s cost analysis is not “meaningful” but in fact “arbitrary and capricious” because the alleged balancing efforts are “indecipherable.” See Makram B. Jaber and Elizabeth L. Horner, Counsel to the Utility Air Regulatory Group, Comments of the Utility Air Regulatory Group (UARG) In Response to the Environmental Protection Agency’s Supplemental Finding That It Is Appropriate and Necessary to Regulate Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units, Before the U.S. Environmental Protection Agency, (Apr. 17, 2012), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ->

allegations of Murray regarding such a requirement by citing purported EPA authority under Clean Air Act section 112(n)(1)(A), of “Congress’s open-ended instruction to the Administrator to determine whether a regulation of EGUs is ‘appropriate and necessary,’” and EPA’s conclusion that all monetized and non-monetized benefits outweigh the cost, given the balancing test articulated in *Chippewa v. FERC*.²⁴⁰

Other commenters criticized the EPA cost analysis. The Director of the Ohio environmental agency stated that data used by EPA was flawed and outdated, and EPA should have done cost analysis “based on the actual data that included only the cost impacts on the portion of the industry actually affected by the rule.”²⁴¹ ARIPPA, a non-profit trade association, after the *Michigan* Court decision asserted that “‘cost’ includes more than the expense of complying with regulations; any disadvantage could be termed cost.”²⁴² Many commenters insisted that EPA must perform formal

OAR-2009-0234-20536&attachmentNumber=1&disposition=attachment&contentType=pdf. (citing *Volkman v. Ryker*, 736 F.3d 1084, 1092 (7th Cir. 2013)) (providing a balancing test implicitly requires courts “to weigh factors against each other, rather than to merely count how many factors line up on each side—one factor of great weight may offset several which lean slightly in the other direction.”). The EPA’s proposed rule does not offer sufficient explanation as to the specific weight EPA gave to each variable or how they are considered in relation to each other, and should, therefore, require formal Cost-Benefit Analysis for determining the rule’s “appropriate and necessary” justification. See Comments by the Texas Commission on Environmental Quality (TCEQ), Texas Railroad Commission, and Texas Public Utilities Commission Regarding 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 (Dec. 1, 2015), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20534&attachmentNumber=2&disposition=attachment&contentType=pdf> (providing transcript of Texas Air Quality Commission’s Comments).

²⁴⁰ *Chippewa v. FERC*, 325 F.3d 353, 357-59 (D.C. Cir. 2003).

²⁴¹ When EPA restricted the public comments limited to the “consideration of cost aspect presented in the proposed supplementary finding” (80 Fed. Reg. 75028) and excluding “EPA’s use of identified environmental harms as a basis for finding it appropriate and necessary to regulate HAP emissions from EGUs” inter alia “EPA’s use of certified data submitted by regulated parties” and more, EPA failed to adhere to clear guidance from the *Michigan* Court. Letter from Scott J. Nally, Director, Ohio EPA, to the U.S. Environmental Protection Agency (Jan. 15, 2016) (on file with the EPA Docket Center), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20560&attachmentNumber=1&disposition=attachment&contentType=pdf>.

²⁴² Letter from George Ellis, Executive Director, ARIPPA, to the U.S. Environmental Protection Agency (Jan. 14, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20535&attachmentNumber=1&disposition=attachment&contentType=pdf>. See also

benefit-cost analysis and should ignore any benefit that can not be measured in monetary units and should not count any benefits that result from the reduction of non-HAP emissions—i.e. EPA should not count ‘co-benefits’ of any reduced criteria pollutants which are not regulated by the MATS rule, which were indispensable for EPA to not have costs exceed direct benefits by more than 1000:1.²⁴³

V. DISPUTED INCLUSION OF INDIRECT ‘CO-BENEFITS’ NOT THE SUBJECT OF THE REGULATION

A. *The Technology of ‘Co-Benefits’*

If cost and benefit now matter legally, the math by which each is calculated determines the final cost-benefit tally and comparison. The algorithm and mathematical operations used to calculate costs and benefit are not without controversy. How one performs the mathematical operations can change and determine the result.

Several members of the *Michigan* Court “were critical that the EPA’s cost-benefit analysis for the MATS rule attributed billions in annual public health benefits to the standards, even though the agency could only quantify between \$4 million and \$6 million in benefits to reduction of hazardous air pollutants.”²⁴⁴ Chief Justice Roberts questioned the legitimacy of counting benefits from reduction of fine particulate matter and other pollutants that are regulated under other sections of the Clean Air Act.²⁴⁵ Is this the correct math if more than 99% of the assumed benefits are not related to what the regulation regulates? The EPA claimed long-term direct plus indirect co-benefits of \$37–90 billion annually, without providing any

Michigan v. EPA: Costs and Benefits Matter, SENATE REPUBLICAN POLICY COMM. (July 9, 2015), <http://www.rpc.senate.gov/policy-papers/michigan-v-epa-costs-and-benefits-matter> (providing background on cost benefit analysis related to *Michigan* court decision). The particular metrics chosen by EPA do not consider the disadvantages from the plant closure as a cost, but the closure of the plant is considered by EPA as impacting the reliability and availability of electricity and any interruption due to closure, ignoring other associated problems such as job loss caused by plant closures. See Broadbent, *supra* note 207 (discussing how costs will be concentrated on particular regions and communities).

²⁴³ Jaber & Horner, *supra* note 239.

²⁴⁴ Patrick Ambrosio, *Supreme Court Remands EPA Mercury Rule for Failing to Consider Cost to Power Plants*, BNA DAILY ENVTL REP. (June 30, 2015), <http://www.bna.com/supreme-court-remands-n17179928911/>.

²⁴⁵ *Id.*

statistical basis or medical proof.²⁴⁶ The only pollutant regulated, mercury, under the MATS rule imposed costs more than 1000 times that of the modest \$4-6 million in direct benefits from reduced mercury. To change the outcome, EPA added in to the ‘benefits’ column additional economic value from other co-benefits of additional pollutants incidentally likely to be reduced when coal-fired plants could not meet the standard and had to cease operations.

Worth noting, the *Michigan* Supreme Court decision does not require EPA to conduct formal cost-benefit analysis. The *Michigan* Supreme Court decision leaves the decision on how to account for cost to EPA: “[i]t [would] be up to the Agency to decide . . . how to account for cost.”²⁴⁷ OMB regulations expressly require agencies to apply cost-benefit analysis for regulations impacting the economy to the degree of magnitude that the MATS rule does. Therefore, EPA performed a formal cost-benefit analysis and again found that cost is substantially outweighed by the total monetized and non-monetized benefits, if and only if co-benefits are added, in its MATS RIA.²⁴⁸ On remand, after consideration of cost based on the four metrics, EPA found that total benefits of the regulation—monetized and non-monetized—ranged between \$37-\$90 billion per year compared to the cost of implementation of \$9.6 billion per year. EPA reaffirmed its earlier finding that the MATS rule is appropriate and necessary when its cost is of this volume weighed against benefits, as required by the Clean Air Act section 112(d).²⁴⁹

²⁴⁶ *Michigan*, 135 S. Ct. at 2706.

²⁴⁷ *Id.* at 2311.

²⁴⁸ Supplemental Finding, *supra* note 211, at 35.

²⁴⁹ *CAA Section 112(d)-Emission Standards*, ENVIRONMENTAL PROTECTION AGENCY (last updated Feb. 23, 2016), <https://www3.epa.gov/airtoxics/112dpg.html>. Some commenters like Exelon Corporation, Calpine Corporation, PSEG, National Resources Defense Council (NRDC), supported EPA’s selected metrics as the real compliance cost, which consists of amortized capital, cost associated with changes in fuel price, Variable Operating and Maintenance cost (VOM), and Fixed Operating and Maintenance (FOM) of MATS Rule as just \$2 billion dollar instead of \$9.6 billion dollar. *See, e.g.*, Letter from Citizens for Pennsylvania’s Future et al., to Nick Hudson, U.S. Environmental Protection Agency (Jan. 15, 2015), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20558&attachmentNumber=1&disposition=attachment&contentType=pdf> (providing commentary on EPA coal and oil regulations). The reduced cost is based on Andover Technology Partners’ analysis of compliance cost. Calpine agreed with EPA’s use of data during the initial promulgation of the rule instead of using the recent data available during the three years of the compliance period arguing that the current data may

Drilling down a level deeper, this MATS regulation of mercury is expected to cause many coal-fired power facilities to either close or operate significantly less, so all air emission pollutants they emit will be reduced from business-as-usual. Counting particulate matter and SO₂ reductions, both of which are produced in abundance by coal-fired power plants compared with gas-fired power plants,²⁵⁰ and are not regulated by MATS, these comprise 99.9% of the EPA-estimated co-benefits of the MATS regulation.²⁵¹ When less than 0.001 of the benefit is related to what the rule regulates, whether co-benefits can be included in the algorithm comes into sharp focus. Natural gas combustion produces significantly less emissions of CO₂ and less of four of the six criteria air pollutants emitted from fossil-fuel fired power generation:

- the amount of carbon dioxide produced by natural gas is about 25% less than oil and almost half as much as coal
- carbon monoxide (92 ppb emitted by natural gas compared to approximately 450 ppb for oil or coal)
- sulfur dioxide (1 ppb for natural gas versus 1,122 ppb for oil and 2,591 ppb for coal)
- almost no nitrogen oxides from natural gas compared to burning other fossil fuels
- almost no particulate matter from natural gas, unlike other fossil fuels²⁵²

be not available to EPA during the time for rule finalization. See Comments of Calpine Corporation, Exelon Corporation, And Public Service Enterprise Group, Inc. on U.S. Environmental Protection Agency's Proposed Supplemental Finding That It Is Appropriate and Necessary to Regulate Hazardous Air Pollutants From Coal- And Oil-Fired Electric Utility Steam Generating Units (December 1, 2015) (on file with EPA Docket), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20549&attachmentNumber=1&disposition=attachment&contentType=pdf>. ("Indeed, the Supreme Court recognized that only a 'preliminary estimate' of cost would be available to the Agency at the time the listing decision is made. *Michigan*, 135 S. Ct. at 2711.").

²⁵⁰ See Ferrey, *supra* note 73 (stating that coal-fired emissions exceed emissions for natural gas-fired power facilities).

²⁵¹ Krauss, *supra* note 8; Jaber & Horner, *supra* note 239.

²⁵² Ferrey, *supra* note 62, at 595-596.

Due to larger economic factors unrelated to, and predating, the MATS rule, gas and coal were exchanging their positions of fuel dominance. From 2006 to 2012, prior to impact of either MATS and the Clean Power Plan, gas use increased 25%, moving from providing 20% of America's electricity to nearly 25%, with coal declining from more than half the source for power a few years before to 36% in 2012.²⁵³ Coal-fired generation has decreased to now approaching ever closer to 30% of power production.²⁵⁴ These changing roles have continued: During the first half of 2016, natural gas supplied 36 percent of U.S. electricity generation, while coal supplied 31 percent.²⁵⁵ The respective shares of different sources of U.S. electricity are shown in Figure 2.

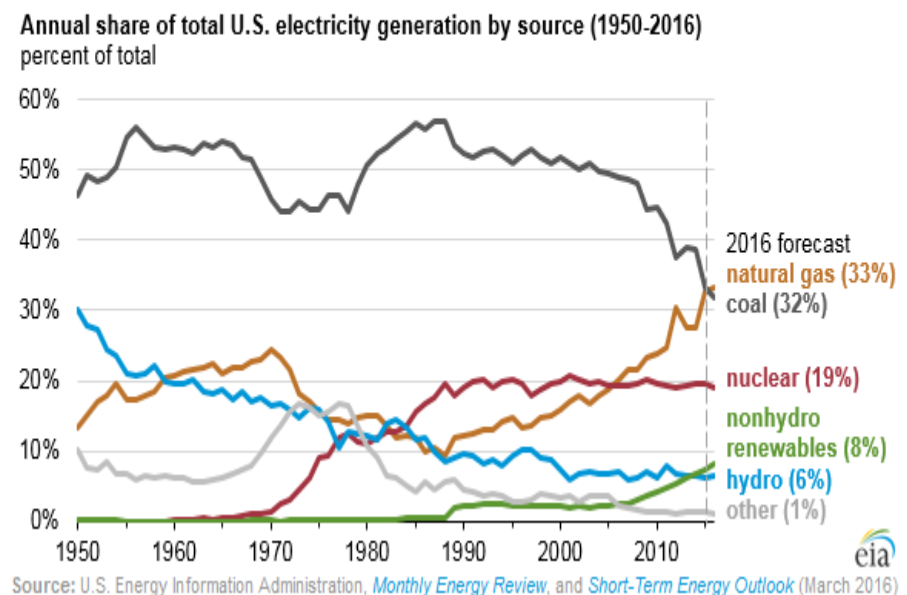
FIGURE 2:

²⁵³ *Gas Works: Shale Gas is giving a big boost to America's Economy*, THE ECONOMIST (July 14, 2012), <http://www.economist.com/node/21558459>.

²⁵⁴ Stephen Lacey, *U.S. Coal Generation Drops 19 Percent In One Year, Leaving Coal with 36 Percent Share of Electricity*, THINK PROGRESS (May 14, 2012), <https://thinkprogress.org/u-s-coal-generation-drops-19-percent-in-one-year-leaving-coal-with-36-percent-share-of-electricity-4b06091d4cde/>

²⁵⁵ Marie Cusick, *Coal may outpace natural gas in electric power generation this winter*, STATE IMPACT (Nov. 23, 2006), <https://stateimpact.npr.org/pennsylvania/2016/11/23/coal-may-outpace-natural-gas-in-electric-power-generation-this-winter/>.

Natural gas expected to surpass coal in mix of fuel used for U.S. power generation in 2016



B. *Counting Outside the Section 112 Lines: The Weight, if any, of Non-Hazardous Pollutants*

The key question raised in *Michigan* is whether it is legitimate in comparing costs and benefits of a particular regulation to count co-benefits from reduction of pollutants that are not regulated by the particular rule. The Supreme Court has yet to answer. Stated in the dimension of technology, if rather than try to order through energy regulation that coal plant operation be diminished, one does so indirectly through environmental regulation of the emissions from coal-fired facilities, can the ‘benefit’ side of the ledger count items that are not regulated on the cost side of the ledger? And beyond the issue of counting co-benefits, can one assume credit to a regulation for changes in technology, fuels, and emissions being driven by economic forces rather than by regulation?

In a defensive posture, EPA, however, in the *Michigan* case claimed it did not consider co-benefits at all, but it was the substantial risks associated with the emission of mercury and HAPs from electric generation

unit power facilities that supported EPA's findings of the reasonableness of the EPA's preferred approach.²⁵⁶ It also argued that co-benefits should be counted in the quantitative benefits.²⁵⁷ In support of why the co-benefits should be considered, EPA argued that:

Because the co-benefits are a direct consequence of actions to reduce HAP emissions, are consistent with economic guidance documents, and are consistent with statutory requirements in CAA [Clean Air Act] Section 112(n)(1)(A), it would be unreasonable for the EPA to ignore co-benefits in the comparison of monetized benefits to monetized costs for MATS.²⁵⁸

EPA submitted that any "proper and complete" benefit analysis must factor in all the pollution reduction of any kind when regulating under section 112(d) of the Clean Air Act which controls power plant hazardous emissions.²⁵⁹ EPA submitted that the inclusion of indirect benefits is consistent with Executive Orders and guidance of OMB.²⁶⁰ Many

²⁵⁶ Supplemental Finding, *supra* note 211, at 47-50. MIT Institute for Data, System and Society predicted, based on the study to estimate the benefits of U.S. (MATS) and global (United Nations Minamata Convention) mercury policy for U.S. populations, including consumers of self-caught freshwater fish and consumers of commercial marine and estuarine fish in the U.S. market that "compared to a scenario without additional mercury and air pollution controls, MATS could yield cumulative lifetime benefits for individuals affected by 2050 of \$147 billion (2005 USD, discounted at 3%), and cumulative economy-wide benefits realized by 2050 of \$43 billion (2005 USD, discounted at 3%). Sensitivity scenarios addressing uncertainties and variability in mercury chemistry, and ecosystem and human responses, led to a range of \$625 million to \$225 billion in lifetime benefits, and \$4.1 million to \$66.2 billion in economy-wide benefits." See Letter from Amanda Giang et al., Institute for Data, Systems, and Society, MIT, to Dr. Nick Hutson, U.S. Environmental Protection Agency (Jan. 15, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20544&attachmentNumber=1&disposition=attachment&contentType=pdf> (providing researchers' comments on EPA's coal and oil regulations).

²⁵⁷ *Id.*

²⁵⁸ *Id.*

²⁵⁹ See Citizens for Pennsylvania, *supra* note 249 (providing commentary on EPA coal and oil regulations).

²⁶⁰ Supplemental Finding, *supra* note 211. See, e.g., Memorandum from George P. Shulz, Director, Office of Management and Budget, for the Heads of Departments and Agencies: Agency regulations, standards, and guidelines pertaining to environmental quality, consumer protection, and occupational and public health and safety (Oct. 5, 1971), <http://www.thecre.com/ombpapers/QualityofLife1.htm> (establishing a procedure that

stakeholder commenters to the proposed and remanded regulation disagreed.

The Texas Commission on Environment Quality (TCEQ) objected to counting co-benefits from particulate matter and sulfur dioxide emission reductions because they are covered under a different section of the Clean Air Act than the section involved with the MATS rule, and are not listed under the relevant section 112(b) of the Act as HAPs.²⁶¹ Opponents of the EPA rule highlighted the purpose of section 112 of the Act “to achieve prompt, permanent, and ongoing reductions in HAP emissions from stationary sources.”²⁶² They argued that it is only “logical” to consider only benefits of HAP emission reduction while considering cost incurred for HAP emission reduction.²⁶³

One concern expressed was the weight that co-benefits play in the total calculation. Analysis of thirty-seven peer-reviewed studies of air quality co-benefits indicates that the co-benefits play a smaller role in the calculation of stringent pollution emission standards.²⁶⁴ Considering co-benefits reduces “the societal cost of climate policy,” or interpreted from the alternative perspective, justifies rigorous climate change regulations “by increasing the avoided societal damages” which are counted as ‘benefits.’²⁶⁵ Even when damages are the main driving force behind any environmental policy regulations, such damages are not generally included in the assessment due to distrust over the reliability of environmental impact

included including costs and benefits on proposals in order to improve the interagency coordination); Exec. Order No. 12044, 43 C.F.R. 12661 (Mar. 24, 1978) (executive order by Jimmy Carter directing each Executive Agency to adopt procedures to improve existing and future regulations); Exec. Order No. 12291, 46 C.F.R. 13193 (Feb. 17, 1981) (executive order by Ronald Reagan stating that regulations should only be enacted if the potential benefits to society outweigh the potential costs to society); Exec. Order No. 12866, 58 C.F.R. 51735 (Oct. 4, 1993) (executive order by Bill Clinton urging agencies to weigh the costs and benefits of policy alternatives).

²⁶¹ Comments of Texas Commission, *supra* note 239.

²⁶² *Id.*

²⁶³ *Id.*

²⁶⁴ See C. Boyden Gray, *EPA’s Use of Co-Benefits*, 16 Engage: J. Federalist Soc’y Prac. Groups 31 (2015) (expressing concern that the vast majority of co-benefits derive from a questionable metric that estimates reductions of premature mortality associated with policy changes); Nemet et al., *Implications of incorporating air-quality co-benefits into climate change policymaking*, 5 Environ. Res. Lett (2010) (finding that “full inclusion of co-benefits depends on—rather than substitutes for—better valuation of climate damages”).

²⁶⁵ *Id.*

studies.²⁶⁶ In the cases when the co-benefits are greatly appreciated as substantial, valuation of earlier loss of life becomes difficult and could make a significant difference in the total benefits counted, with or without co-benefits.²⁶⁷

The tail wags the dog with the MATS regulations remanded by the Supreme Court: Reduction of particulate matter, itself not a toxic pollutant, occurring coincidentally through the assumed closure of coal-fired plants which could not cost-effectively meet the MATS rule, due to emission regulation only of mercury, were forecast to reduce the premature mortality from particulate matter in the air by about 98%, becoming the greatest monetized ‘benefit’ in the MATS benefit protocol.²⁶⁸ This co-benefit value becomes significant based on the estimated “value per statistical life” assumed to be saved by less particulate matter emissions to the ambient air, although it was noted by commenters that the the EPA-assigned value

²⁶⁶ See WILLIE SOON, A SCIENTIFIC CRITIQUE OF THE ENVIRONMENTAL PROTECTION AGENCY’S “NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS [NESHAP] 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 (2011) (“The EPA proposal neglects key scientific knowledge and many peer-reviewed papers that suggest there is no straightforward connection between mercury (Hg) emissions from power plants or other man-made sources to the mercury level in fish. There is little doubt that levels of the biologically active form of mercury, methylmercury (MeHg) that are ultimately accumulating in fish tissue depends primarily upon environmental and ecosystem factors such as amounts of sulfate, sunlight and organic matter, pH level, water temperature, and amounts of bacteria or zooplankton. MeHg levels in fish do not depend simply on the amount of elemental Hg available for conversion. This is why a distinguished group of mercury science experts 7 concluded that a simple change in bacterial activity alone could cause an *increase* in fish mercury concentrations, even as atmospheric deposition [from industrial mercury emission sources] *decreases*.”).

²⁶⁷ *Id.*

²⁶⁸ Gray, *supra* note 264, at 31. See also *Ambient (outdoor) air quality and health*, WORLD HEALTH ORG. (Sept. 2016), <http://www.who.int/mediacentre/factsheets/fs313/en/> (“A 2013 assessment by WHO’s International Agency for Research on Cancer (IARC) concluded that outdoor air pollution is carcinogenic to humans, with the particulate matter component of air pollution most closely associated with increased cancer incidence, especially cancer of the lung. An association also has been observed between outdoor air pollution and increase in cancer of the urinary tract/bladder. Ambient (outdoor air pollution) in both cities and rural areas was estimated to cause 3.7 million premature deaths worldwide per year in 2012; this mortality is due to exposure to small particulate matter of 10 microns or less in diameter (PM₁₀), which cause cardiovascular and respiratory disease, and cancers.”).

disregards the age of the person, *inter alia* the earning capacity of the individual, and the person's potential contribution to society.²⁶⁹

Commenters noted that such a method of measuring co-benefits in monetary value was questionable since “significant uncertainty remains” regarding “the reduction of premature deaths associated with a reduction in particulate matter and ... the monetary value of reducing mortality risk.”²⁷⁰ The existing particulate matter standards are otherwise already established by another section of the Clean Air Act to already protect human health with “an adequate margin of safety.”²⁷¹ Of note, the Supreme Court, in another matter, held that different sections of the Clean Air Act are distinct and separate, such that EPA can adopt fundamentally different interpretations of identical Congressional language used in both sections.²⁷²

Historic perspective and practice: Notwithstanding stakeholder criticisms of the MATS rule methodology, EPA's use of co-benefits in the ‘benefits’ calculation has been the EPA practice in the past.²⁷³ However,

²⁶⁹ Gray, *supra* note 264.

²⁷⁰ *Id.*

²⁷¹ 42 U.S.C. §§ 7408(a), 7409(b)(1).

²⁷² *Environmental Defense v. Duke Energy Corp.*, 549 U.S. 561 (2007) (providing that the EPA can define “modification” differently in sections 110 and 111 of the Clean Air Act).

²⁷³ *Joint Statement by Inst. for Policy Integrity at NYU Law School to EPA* (Jan. 15, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20538&attachmentNumber=1&disposition=attachment&contentType=pdf>. “Moreover, EPA—under presidents of both parties and across four decades—has consistently taken indirect benefits into account when evaluating Clean Air Act regulations. For example, when proposing to develop New Source Performance Standards for municipal waste combustors, EPA under President Reagan explained that it intended to ‘consider the full spectrum of the potential impacts of regulation,’ including ‘indirect benefits accruing from concomitant reductions in other regulated pollutants.’ Similarly, in proposing performance standards for landfill gases, EPA under President George H.W. Bush justified the regulation partly by reference to ‘the ancillary benefit of reducing global loadings of methane.’ EPA under President Clinton analyzed the indirect benefits of reducing co-pollutants like volatile organic compounds, particulate matter, and carbon monoxide from emissions standards addressing hazardous pollutants from pulp and paper producers. In promulgating a rule on mobile source air toxics, EPA under President George W. Bush noted, ‘Although ozone and [particulate matter] are considered criteria pollutants rather than “air toxics,” reductions in ozone and [particulate matter] are nevertheless important co-benefits of this proposal.’ Finally, EPA under President Obama considered the indirect benefits from reducing carbon monoxide, volatile organic compounds, and nitrogen oxides in its analysis of regulating hazardous air pollutants from combustion engines.” (citing 52 Fed. Reg. 25,399, 25,406 (July 7, 1987); 56 Fed. Reg. 24,468, 24,469 (May 30, 1991); 63

the influence of such co-benefits has never been so profound in influencing the ultimate balance and outcome of the cost-benefit calculation for recent regulations: The immense cost in the billions of dollar for the emission control programs for greenhouse gas reduction under the Clean Power Plan²⁷⁴ and MATS swamp by one-thousand times the direct ‘benefit’ from the targetted emission controlled, which is valued at less than six million dollars.

Benefits only exceed costs by counting co-benefits from the reduced amounts of other chemicals that are linked to mortality incidences. Particulate matter is not a hazardous chemical and is a criteria pollutant separately controlled to an “adequate margin of safety”²⁷⁵ under a different section of the Clean Air Act’s National Ambient Air Quality Standards, under which it is not an objective to minimize emissions of criteria pollutants.²⁷⁶ As EPA noted in its MATS RIA:

NAAQS are not set at a level of zero risks. Instead, the NAAQS reflect the level determined by the Administrator to be protective of public health within an adequate margin of safety, taking into consideration effects on susceptible populations. While benefits occurring below the standard may be less certain than those occurring above the standard, EPA considers them to be legitimate components of the total benefits estimate.²⁷⁷

The NAAQS for criteria pollutants, like NO_x, already are set at supposedly safe levels, based on the science. The EPA reevaluates the NAAQS every five years set according to “air quality criteria [that] shall accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which

Fed. Reg. 18,504, 18,585–86 (Apr. 15, 1998); 72 Fed. Reg. 8428, 8430 (Feb. 26, 2007); 75 Fed. Reg. 51,570, 51,578 (Aug. 20, 2010)).

²⁷⁴ See Gray, *supra* note 264.

²⁷⁵ The EPA must establish NAAQS for pollutants; pursuant to §109(b) of the Clean Air Act, those standards must be “requisite to protect public health” with “an adequate margin of safety.” 42 U.S.C. §§ 7408(a), 7409(b)(1).

²⁷⁶ See 42 U.S.C. §§ 7408(a), 7409(b)(1) (Statutes providing air quality criteria and control techniques).

²⁷⁷ U.S. EPA, *Regulatory Impact Analysis for the Final Mercury and Air Toxics Standards, EPA-452/R-11-011* (Dec. 2011), <https://www3.epa.gov/ttnecas1/regdata/RIAs/matsriafinal.pdf>.

may be expected from the presence of such pollutant in ambient air, in varying quantities.”²⁷⁸ Separately, EPA, based on the guidance of its science advisory panel, proposed revisions of the NAAQS for particulate matter to be reduced for all Air Quality Control Regions in the country to 12 $\mu\text{g}/\text{m}^3$ from the prior standard of 15 $\mu\text{g}/\text{m}^3$ to preserve an adequate margin of safety. This is a 20% tightening of the PM emissions standard. In 2013, the EPA “tightened the annual, health-based national ambient air quality standard for fine particles, which had been set at 15 micrograms per cubic meter.”²⁷⁹ The EPA retained its daily $\text{PM}_{2.5}$ standard of 35 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) set in 2006.²⁸⁰

C. The ‘New Math’ of ‘Co-Benefits’

The states, stakeholders, and the scientific community are split on the inclusion or non-inclusion of incidental co-benefits in any cost-benefit calculation or algorithm for federal environmental regulations. With regard to another Obama Administration regulation, the Clean Power Plan also counts a very large amount of co-benefits from reduction of other than its expressly and solely targeted CO_2 , and counts many international climate benefits in proportion to relatively limited domestic climate benefits, evaluated against its substantial future domestic compliance costs.²⁸¹

Former EPA Administrator Mike Leavitt stated “cleaning the air gets more difficult as the maximum benefits from existing rules are

²⁷⁸ Susan E. Dudley, *Supp. Finding that it is Appropriate and Necessary to Regulate Hazardous Air Pollution from Coal and Oil-Fired Elec. Utility Steam Generating Units* (Jan. 11, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20527&attachmentNumber=1&disposition=attachment&contentType=pdf> (citing Clean Air Act §108(a)(2). “The Supreme Court has confirmed EPA’s interpretation that this statutory language precludes consideration of any impacts other than direct health effects from exposure to the pollutant.” *Id.* at 4 n.8.

²⁷⁹ Patrick Ambrosio, *14 Areas Don’t Meet Air Quality Standard for Fine Particulates, EPA Says in Proposal*, 45 ENV’T REP. 2517 (BNA) (Aug. 28, 2014). EPA revised the annual primary $\text{PM}_{2.5}$ NAAQS to 12 $\mu\text{g}/\text{m}^3$ from the previous level of 15 $\mu\text{g}/\text{m}^3$ on Dec 14, 2012. U.S. ENVIRONMENTAL PROTECTION AGENCY, REVISED AIR QUALITY STANDARDS FOR PARTICLE POLLUTION AND UPDATES TO THE AIR QUALITY INDEX (AQI) 1 (2012). <http://www3.epa.gov/airquality/particlepollution/2012/decfsstandards.pdf>.

²⁸⁰ *Id.*

²⁸¹ See Andrew M. Grossman, *Michigan v. EPA: A Mandate for Agencies to Consider Costs*, 2015 CATO SUP. CT. REV. 281, 306–07 (2015) (providing scholarly commentary on *Michigan* case).

achieved and the low-hanging fruit is gone.”²⁸² Any new regulations would be costlier to implement, and any cost-benefit justification of the rule requiring high cost of implementation with very little direct benefit will require the inclusion of air quality co-benefits to make the rule cost-effective. When the co-benefits counted are greater than the benefits, as with each of the unilaterally promulgated EPA Clean Power Plan and MATS rules, the co-benefits are no longer incidental mathematically. The co-benefits change the results from costs that far exceed the direct benefits, to thereafter flip the outcome when all incidental co-benefits plus direct benefits exceed costs. Co-benefits are a game changer for the environment and climate policy.

EPA’s position regarding the MATS rule is:²⁸³

- the statutory language of section 112(n) of the Clean Air Act on hazardous pollutants does not explicitly prohibit consideration of co-benefits;
- the ruling of the Supreme Court in *Michigan* does not explicitly prohibit particulate matter and sulfur dioxide co-benefits inclusion in calculations of the net benefits of hazardous substance regulation; and
- recognition of “collateral benefit of controlling criteria pollutants” in the legislative history of Clean Air Act section 112(d)(2) is Congress’s implicit indirect permission to include such ancillary co-benefits in a cost-benefit calculation.

Attorney-Generals from fifteen states supported EPA’s inclusion of co-benefits from pollutants not controlled under section 112 of the Act.²⁸⁴

²⁸² Cynthia Bergman, *2003 Status Report Shows U.S. Air Cleanest Since 1970*, EPA (Sep. 9, 2004), <https://yosemite.epa.gov/opa/admpress.nsf/0/d13d7cbd4048f16e85256f1700536aaf?OpenDocument>.

²⁸³ See 135 S.Ct. at 2711 (“Even if the Agency could have considered ancillary benefits when deciding whether it is appropriate and necessary – a point we need not address – it plainly did not so here.”); 42 U.S.C. § 7412(n)(1)(A) (regulating hazardous air pollutants); Supplemental Finding that it is Appropriate and Necessary to Regulate Hazardous Air Pollutants from Coal-and Oil-fired Electric Utility Steam Generating Units, page 98-99 (citing S. Rep. No. 101-228, 101st Cong. 1st sess. at 172).

EPA in its rule-specific Regulatory Impact Analysis for MATS mentions the steps it has taken to avoid double-counting of benefits.²⁸⁵ EPA, denying the allegation of double-counting levelled against it, stated:

[s]tandard practice for its rules is to estimate, to the extent data and time allow, all benefits of the emissions reductions achieved by a rule beyond control requirements for other rules. If this rule was duplicative with other rules, then there would be no additional costs or benefits attributable to this rule.²⁸⁶

EPA claimed that in its MATS analysis it includes “rules such as Cross-State Air Pollution Rule (CSAPR) in the ‘baseline’ in estimating the

²⁸⁴ See Joint Statement by Fifteen State Attorney Generals to EPA (Jan. 15, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20551&attachmentNumber=1&disposition=attachment&contentType=pdf> (providing statement from Attorney Generals to EPA).

²⁸⁵ See also *U.S. EPA, Regulatory Impact Analysis for the Final Mercury and Air Toxics Standards, EPA-452/R-11-011* (Dec. 2011), <https://www3.epa.gov/ttnecas1/regdata/RIAs/matsriafinal.pdf>, at page 110 (“To avoid double-counting benefits from reductions in myocardial infarctions when applying the impact function for cardiovascular hospital admissions, we first adjusted the baseline cardiovascular hospital admissions to remove admissions for myocardial infarctions.”). “To prevent double-counting, we focused the estimation on asthma exacerbations occurring in children and excluded adults from the calculation.” *Id.* at 113.

²⁸⁶ EPA, *Supplemental Finding that it is Appropriate and Necessary to Regulate Hazardous Air Pollutants from Coal-and Oil-fired Electric Utility Steam Generating Units*, at 107 (citing U.S. EPA. 2011. EPA’s Responses to Public Comments on EPA’s National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units. December. Volume 2 of 2. Docket ID No. EPA-HQ-OAR-2009-0234-20126). The EPA counts the benefits from the reductions of pollutants beyond the floor-level to avoid any double-counting. *Id.* However, the opponents of the MATS Rule based on double-counting argued that when the industry has already achieved the standards set by the particular Clean Air Act rule, which again are set by EPA for maximum benefit with the available technology, counting benefits from further reduction beyond floor-level is unreliable and such benefits are thus double-counting. *Id.* EPA clarified further that “PM_{2.5} health benefits expected from MATS are not double-counted with benefits estimated in the NAAQS RIAs . . . because the NAAQS are not set at a level of zero risk and the science fully supports quantifying benefits below the NAAQS, the EPA considers them to be legitimate components of the total benefit estimate.” *Id.* Subsequently, EPA proposed the updated NAAQS standards and included MATS Rule as baseline to avoid any double-counting. *Id.*

benefits and costs of rules like MATS.”²⁸⁷ EPA claimed that any emission reduction as a result of MATS are additional reductions and hence not counted twice; likewise benefits of particulate matter reduction per the MATS rule are not counted with the estimated benefits of the NAAQS RIA.²⁸⁸ So, alleged double-counting is not being claimed for the MATS rule analysis, but any double-counting is shifted by EPA to the revised NAAQS promulgation, which was separately promulgated and not under challenge in the *Michigan* matter. EPA, in its revised NAAQS RIA, stated that:

One important distinction between the total public health burden estimated for 2005 air pollution levels and the estimated benefits in this RIA is that ambient levels of PM_{2.5} will have improved substantially by 2020, due to major emissions reductions resulting from implementation of Federal regulations. For example, we estimate that SO₂ emissions (an important PM_{2.5} precursor) in the United States would fall from 14 million tons in 2005 to less than 5 million tons by 2020 (a reduction of 66%). For this reason, States will only need to achieve small air quality improvements to reach the proposed PM standards. As shown in the recent RIA for MATS (U.S. EPA, 2011b), implementing other Federal and State air quality actions will address a substantial fraction of the total public health burden of PM_{2.5} and ozone air pollution.²⁸⁹

²⁸⁷ Susan E. Dudley, *Supp. Finding that it is Appropriate and Necessary to Regulate Hazardous Air Pollution from Coal and Oil-Fired Elec. Utility Steam Generating Units* (Jan. 11, 2016), at 107. See also Joint Statement, Inst. for Policy Integrity, NYU Law School (Jan. 15, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20538&attachmentNumber=1&disposition=attachment&contentType=pdf> (providing statement from NYU Law’s Institute for Policy Integrity regarding regulation of coal and oil fired power plants).

²⁸⁸ EPA, *Supplemental Finding that it is Appropriate and Necessary to Regulate Hazardous Air Pollutants from Coal-and Oil-fired Electric Utility Steam Generating Units*, *supra* note 286. See also *Regulatory Impact Analysis for the Final Revisions to the National Ambient Air Quality Standards for Particulate Matter* (February 28, 2013), <http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100G5UO.pdf> (providing analysis for final revision of particulate matter NAAQs).

²⁸⁹ *Regulatory Impact Analysis for the Final Revisions to the National Ambient Air Quality Standards for Particulate Matter*, <http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100G5UO.pdf>.

Some professors supported EPA's use of co-benefits because more credible evidence now exists that exposure to methylmercury has adverse impacts on the cardiovascular health, and it is "challenging to isolate the neurodevelopmental and cardiovascular impacts of methylmercury exposure from seafood consumption because seafood also contains long-chained fatty acids . . . serves to mask those deleterious impacts."²⁹⁰ However, this is more a critique of the difficulty of assessing the benefits of health, than it is a principled concept of how to structure the cost-benefit algorithm. Another professor stated that "EPA correctly avoids double-counting those benefits here" because it only counts MATS rule PM_{2.5} reductions "well below the levels it has already determined are 'protective of public health with an adequate margin of safety.'"²⁹¹ This last statement, however, would seem to invite critique of the true value of separate pollutant reductions already necessary and implemented through the NAAQS to protect human health.

EPA's allocation of co-benefits to prior different rules is not accepted by many commenters. The Chief Environmental Officer of the Southern Company commented that EPA contradicts its own position taken

²⁹⁰ Joint Statement by Elsie M. Sunderland, Charles T. Driscoll, Jr., James K. Hammitt, Philippe Grandjean, John S. Evans, Joel D. Blum, Celia Y. Chen, David C. Evers, Daniel A. Jaffe, Robert P. Mason, and the Emmett Environmental Law & Policy Clinic to EPA (Jan. 15, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20547&attachmentNumber=1&disposition=attachment&contentType=pdf> (citing K.R. Mahaffey, et al., Balancing the benefits of n-3 polyunsaturated fatty acids and risks of methylmercury exposure from fish consumption, *Nutrition Revs.*, 69(9): 493-508 (2011); E. Oken, et al., *Maternal fish intake during pregnancy, blood mercury levels and child cognition at Age 3 years in a US Cohort*, *AM. J. EPIDEMIOLOGY*, 167(10): 1171-1181 (2008)).

²⁹¹ Dudley, *supra* note 115; *see also* MATS RIA Final, at page 224 ("Approximately 11% of the avoided premature deaths occur at or above an annual mean PM_{2.5} level of 10 µg/m³ (the LML of the Laden et al. 2006 study), and about 73% occur at or above an annual mean PM_{2.5} level of 7.5 µg/m³ (the LML of the Pope et. Al. 2002 study). As we model avoided premature deaths among populations exposed to levels of PM_{2.5} that are successively lower than the LML of each study our confidence in the results diminishes. The International Society for Environmental Epidemiology (ISEE) responding to the EPA's invitation for comments on NAAQS standards update, recommends to reduce annual PM_{2.5} to the level of 10 µg/m³ as recommended by WHO's assessment that "adverse effects on health cannot be entirely ruled out below [that] level[]." WORLD HEALTH ORGANIZATION, WHO AIR QUALITY GUIDELINES FOR PARTICULATE MATTER, OZONE, NITROGEN DIOXIDE AND SULFUR DIOXIDE 10 (2005) [hereinafter WHO AIR QUALITY]; *see also* MATS RIA Final, Figure 5-15.

for NAAQS review by still counting the benefits of further reduced particulate matter, a criteria pollutant, under HAP hazardous emission control.²⁹² It was asserted that this co-benefits calculation clouded EPA's cost-benefit analysis and justification for the MATS rule's "appropriate and necessary" findings, by double-counting the benefits of particulate matter and sulfur dioxide which are pollutants covered only under National Ambient Air Quality Standards of the Clean Air Act.²⁹³

Other states and commenters were critical of the EPA protocol to include co-benefits that are not regulated by the MATS regulation. Opponents of the EPA's consideration of co-benefits from criteria air pollutants not within mercury and HAP emission control, argued that such practice is contrary to Congress's intention. Congress intended EPA to consider hazardous HAP co-benefits but did not allow EPA to consider non-hazardous criteria pollutant co-benefits.²⁹⁴ On the discretion of EPA to

²⁹² See *Comments of Southern Company to the EPA* (Jan. 15, 2016) <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20543&attachmentNumber=2&disposition=attachment&contentType=pdf> (providing a statement from Southern Company supporting regulation of pollutants from coal and oil power plants).

²⁹³ See Gray, *supra* note 264 ("PM_{2.5} and Ozone are both already directly regulated by EPA's NAAQS to a level 'requisite to protect the public health' with 'an adequate margin of safety.' Thus, whenever EPA counts PM_{2.5} or Ozone reductions in its cost-benefit analysis for other rules, it is double-counting reductions already mandated by NAAQS.").

²⁹⁴ *Id.* ("The Agency attempts to justify its reliance on PM co-benefits by pointing to the HAP co-benefits related to the Acid Rain Program and other CAA programs that were intended to reduce criteria pollutant emissions. According to the EPA, if Congress approved of HAP co-benefits occurring as a result of criteria pollutant regulation, it is reasonable to assume Congress wanted the Agency to account for criteria pollutant co-benefits in the HAPs context. But, this rationale reverses Congress' intent by ignoring that Congress clearly directed the EPA to account for HAP co-benefits that would result from regulation under other aspects of the CAA. As a result, Congress' recognition of the HAP co-benefits actually undercut's the EPA's reliance on criteria pollutant co-benefits to support regulation of HAPs. The EPA's position would disregard the very limitation of §112(n)(1)(a) – which does not permit the Agency to regulate HAP emissions unless it deems it "appropriate and necessary" after it has *already regulated* criteria pollutant emissions from EGUs. By seeking to justify regulation of HAP emissions through further reduction of criteria pollutants beyond that required by other CAA programs, the EPA essentially circumvents the limitations of §112(n)(1)(a)."). Cf. 42 U.S.C. § 7412(n)(1)(A) ("The Administrator shall perform a study of the hazards to public health reasonably anticipated to occur as a result of emissions by electric utility steam generating units of pollutants listed under subsection (b) after imposition of the requirements of this Act. The Administrator shall report the results of this study to the Congress within 3 years after the date of the enactment of the Clean Air Act Amendments of 1990. The Administrator shall

count co-benefits, the Director of the Ohio EPA, in comments to US EPA, stated:

“When U.S. EPA promulgates a revised National Ambient Air Quality Standard (NAAQS) it uses the amount of air quality improvement as a measure to determine benefits. If a facility installs controls to meet the NAAQS and also complies with the Utility MATS, plus Cross-State Air Pollution Rule (CSAPR), U.S. EPA should not double or even triple count those reductions as part of each rulemaking. The health benefit that U.S. EPA states is occurring can only occur once, not be recounted multiple times under separate U.S. EPA rulemakings.”²⁹⁵

Similar arguments were expressed by others opposing the MATS rule based on EPA’s alleged double-counting of benefits.²⁹⁶ EPA’s reliance on counting the benefits from massive criteria pollutant reductions that were forecast to occur due to implementation of other NAAQS regulations unrelated to MATS to justify MATS and CSAPR, could be viewed, or not viewed, as double or triple-counting of benefits.²⁹⁷

develop and describe in the Administrator’s report to Congress alternative control strategies for emissions which may warrant regulation under this section. The Administrator shall regulate electric utility steam generating units under this section, if the Administrator finds such regulation is appropriate and necessary after considering the results of the study required by this subparagraph.”).

²⁹⁵ *Comment by Ohio Env. Protection Agency to EPA* (Jan. 15, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20560&attachmentNumber=1&disposition=attachment&contentType=pdf>.

²⁹⁶ *See Comment by Counsel for Utility Air Group to EPA* (Dec. 1, 2015), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234-20557&attachmentNumber=1&disposition=attachment&contentType=pdf> (“In order for there to be co-benefits from PM2.5 to attribute to the Proposed Rule, the Proposed Rule must require more reductions of primary PM2.5 and PM2.5 precursors (e.g., SO2 and NOx) than would otherwise occur under other existing regulations, including the current National Ambient Air Quality Standards (NAAQS) for PM2.5. To include any co-benefits from reductions that will occur anyway as a result of the current PM2.5 NAAQS in this rule would be to double-count those benefits – first as the direct benefits that were counted to justify the PM2.5 NAAQS in that rule’s 2006 RIA (EPA, 2006), and then again as co-benefits to justify this Proposed Rule.”).

²⁹⁷ *See Comment by National Mining Association to EPA* (Jan. 15, 2016), <https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2009-0234->

The Supreme Court deferred any comment on the math or algorithm that the EPA could use as its methodology to consider costs. Since EPA admitted that it had not considered cost, and did not present to the Court a methodology for cost consideration, by its own admission, the Supreme Court awaited the EPA to sustain this regulatory burden before evaluating or opining on specific elements to be chosen by EPA. It remains an open question whether environmental changes that are not the subject of an agency rule can be counted as incidental co-benefits of implementing the rule and imposing the rule's costs. Until *Michigan*, this was an academic exercise. Post *Michigan*, this calculation determines the regulatory future of U.S. law.

VI. SQUARING THE REGULATORY CIRCLE

A. Legal Precedent

In the absence of congressional clarity, judicial decisions and precedent resolve statutory ambiguity and conflicts in interpretation. The author's search for adjudicated EPA cases sanctioning double-counting of benefits produced no precedent. Nor did a search for precedential rules for resolving conflict between existing federal environmental and energy law, which also yielded no decisions or statutory directives.²⁹⁸ These are now matters of unresolved first impression.

Reverting back to the underlying statute, under the Clean Air Act, there is a specified division of state and federal authority where states have the "first-implementer role,"²⁹⁹ while EPA "is relegated . . . to a secondary role."³⁰⁰ However, within this overlapping jurisdictional envelope, there is no federal case law, nor any FERC, Department of Energy, or EPA rules, which resolve direct conflicts between mandating and counting environmental benefits from restraining power plant operation and commands of other agencies to operate fossil fuel-fired power generation

20531&attachmentNumber=1&disposition=attachment&contentType=pdf (providing the statement by National Mining Association urging EPA to rescind and re-propose its "appropriate and necessary" finding for electric generating units).

²⁹⁸ See Ferrey, *supra* note 48 (proving that author could not find precedent for EPA cases sanctioning double-counting).

²⁹⁹ *EME Homer City Generation, L.P.*, 696 F.3d at 31 (quoting *Train v. Natural Res. Def. Council*, 421 U.S. 60, 79 (1975)) (emphasis omitted).

³⁰⁰ *Train v. Natural Res. Def. Council*, 421 U.S. 60, 79 (1975).

units.³⁰¹ The closest precedent is provocative Supreme Court *dicta* from four decades ago in *Union Electric*,³⁰² that an owner of a fossil fuel-fired power generation facility can *always* “shut down its plant and curtail electric service” to meet any imposed environmental requirements. Congressional testimony in 2014 by FERC Commissioner Clark characterized the unresolved conflict between proposed environmental regulation to assist climate goals and the countervailing pressure to protect power system operating reliability and resiliency as a looming “jurisdictional train wreck.”³⁰³

As close as the court has ventured to resolve environmental and energy conflicts, involved not clean air, but the Clean Water Act. In its 2009 *Riverkeeper* decision,³⁰⁴ the Supreme Court held that Congress, pursuant to Clean Water Act section 316(b), did not categorically forbid EPA from comparing costs to benefits when determining what is the best technology available for minimizing adverse environmental impacts of power plant cooling water intake structures.³⁰⁵ EPA was left the authority to decide to engage or not in such analysis.³⁰⁶ Any Presidential administration could decide how or if to exercise this discretion.

Pursuant to the key Court decision in *Michigan v. EPA*, Section 112(n) of the Clean Air Act authorizes the EPA to regulate hazardous air pollutants from power plants only if it concludes that such regulation is “appropriate and necessary.”³⁰⁷ In reaching its conclusion to regulate, EPA stated that cost was irrelevant, which the Supreme Court found was not reasonable agency interpretation regarding what was “appropriate and

³⁰¹ See Ferrey, *supra* note 48 (supporting proposition that author could not find case law or rules resolving conflicts in counting environmental benefits).

³⁰² See generally *Union Elec. v. Env'tl. Prot. Agency*, 427 U.S. 246 (1976) (holding that an owner of fossil fuel power facility can shut down its plant to meet environmental requirements).

³⁰³ Lynn Garner, *FERC Comm'rs Split on Party Lines Over EPA's Carbon Rule for Power Plants*, BLOOMBERG (July 29, 2014), http://info.bna.com/climate/summary_news.aspx?ID=274977.

³⁰⁴ *Entergy Corp. v. Riverkeeper*, 556 U.S. 208 (2009). The Court did not *require* EPA to employ cost-benefit analysis, however EPA must provide a reasoned explanation if it should choose to regulate in a way that would do more harm than good, or provide a reasoned explanation why the agency is indifferent to that outcome. *Id.* at 236.

³⁰⁵ *Id.*

³⁰⁶ *Id.*

³⁰⁷ See 42 U.S.C. 7412(n) (regulating hazardous air pollutants).

necessary.”³⁰⁸ The narrow majority in *Michigan* stated that “no regulation is ‘appropriate’ if it does significantly more harm than good.”³⁰⁹ Quoting Justice Breyer’s concurring opinion in *Riverkeeper*, the majority further reasoned that:

Agencies have long treated cost as a centrally relevant factor when deciding whether to regulate. Consideration of cost reflects the understanding that reasonable regulation ordinarily requires paying attention to the advantages *and* the disadvantages of agency decisions. It also reflects the reality that “too much wasteful expenditure devoted to one problem may well mean considerably fewer resources available to deal effectively with other (perhaps more serious) problems.” Against the backdrop of this established administrative practice, it is unreasonable to read an instruction to an administrative agency to determine whether “regulation is appropriate and necessary” as an invitation to ignore cost.³¹⁰

EPA admitted that the overwhelming majority of its total estimated MATS benefits – 99.9% – are due to reduction of particulate matter and sulfur dioxide, which as criteria pollutants, are not regulated by the MATS rule, which only regulates mercury and air toxics as hazardous pollutants.³¹¹ Criteria pollutants, under different parts of the Act, already are subject to “stringent” regulations for NAAQS and also are further reduced by EPA’s separate CSAPR rule.³¹² “Incidental” co-benefits have both a qualitative and quantitative element. Under the MATS regulation, the indirect incidental co-benefits are *not* incidental in quantitative amount – they are totally responsible, alone, for changing the cost-benefit calculation to make total benefits exceed cost and thereby quantitatively justify regulation.³¹³ Ninety-nine and nine-tenth percent of the total benefits from these MATS

³⁰⁸ *Michigan*, 135 S. Ct. 2699.

³⁰⁹ *Id.*

³¹⁰ *Id.*

³¹¹ *Id.*

³¹² *Id.*

³¹³ See Krauss, *supra* note 8; Jaber & Horner, *supra* note 239 (providing that the indirect criteria pollutant co-benefits, unregulated by MATS, are 99.9% of total benefits counted by EPA, while the directly MATS-regulated CO₂ benefits are 0.1% of total benefits counted by EPA).

Clean Air Act regulations are from estimated reduced mortality due to a “co-benefit” reduction in particulate matter criteria pollutants.³¹⁴

The question still remaining to be resolved by the Court is: Can the “co-benefits” tail wag the direct benefit regulatory dog? *EME Homer* established the permissibility of cost considerations under an admittedly ambiguous different provision of the Clean Air Act.³¹⁵ Where PM_{2.5} criteria pollution already regulated elsewhere in the Act must be reduced by an explicit “adequate margin of safety” for human health below its NAAQS standards, in the cost algorithm can an agency also count additional reductions in PM_{2.5} that are not regulated by the challenged MATS rule?³¹⁶ This is still a matter yet to be determined by the Court.

B. *The Next Step*

This is a matter of first impression for the Court: There are no precedent on this issue of the regulatory operands, nor, amazingly, on the more broad question of using environmental mechanisms to influence energy generator operation.³¹⁷ So where does this leave regulatory cost and the law? The *Michigan* Supreme Court decision did not diminish *Chevron deference* for the EPA to make the initial choice of the cost analysis methodology and algorithm for assessing costs.³¹⁸ However once selected and applied by the agency, its methodology still can be reviewed by the Supreme Court under the “hard-look” doctrine established in *Overton Park*

³¹⁴ *See id.*

³¹⁵ Morss & Wooley, THE CLEAN AIR ACT HANDBOOK, *supra* note 42 at 4.

³¹⁶ *See* Dudley, *supra* note 112 (providing background leading author to ask hypothetical question). *See also* MATS RIA Final, at page 224 (“Approximately 11% of the avoided premature deaths occur at or above an annual mean PM_{2.5} level of 10 µg/m³ (the LML of the Laden et al. 2006 study), and about 73% occur at or above an annual mean PM_{2.5} level of 7.5 µg/m³ (the LML of the Pope et. Al. 2002 study). The International Society for Environmental Epidemiology (ISEE) responding to the EPA’s invitation for comments on NAAQS standard’s update, recommends reducing annual PM_{2.5} to the level of 10 µg/m³ as recommended by WHO’s assessment that “adverse effects on health cannot be entirely ruled out even below that level.” WHO AIR QUALITY *supra* note 291; *see also* MATS RIA Final, Figure 5-15 (accounting for additional benefits).

³¹⁷ *See* Ferrey, *supra* note 48 (establishing that author could not find precedent).

³¹⁸ *See Michigan* 135 S. Ct. 2699 (supporting that court did not diminish *Chevron* deference).

v. Volpe.³¹⁹ In *Overton Park*, Justice Marshall, also speaking for a unanimous Court, reversed the agency reading of the statute, to discourage adding any consideration of costs or benefits.³²⁰ However, *Overton Park* did not involve the Clean Air Act or EPA, and instead involved the confiscation by the Department of Transportation of park property and other land to build a highway.³²¹

The Clean Air Act provides no guidance as to cost thresholds or how costs and benefits should be calculated. The Act's Section 112 does not require that hazardous air pollutant emission control costs can be compared with benefits of reduced mercury hazardous air pollutants only. The *Michigan* Court noted that costs include the up-front cost of implementation, but also include the cost of compliance with the rulemaking.³²² If challengers can successfully categorize reduced revenues from fewer generation hours of operation of an affected power generation facility as costs of complying with the regulation, EPA's rulemaking could be deemed by challengers as not benefit-positive or as administratively unreasonable.

Citing the recent Supreme Court decision in *King v. Burwell*,³²³ decided in the same Court term, the challenging states on the cost issue in the MATS regulation maintained that EPA would require explicit authority from Congress to regulate an area in which it does not regularly participate (e.g. electricity generation) or to implement aggressive measures to reorganize how power is generated and sold in America, which is within FERC, not EPA, jurisdiction. In *King*, the Court held that the IRS would not be granted *Chevron* deference because the IRS does not have expertise in crafting health insurance policies; Congress would have to grant express authority to the agency in order to have this.³²⁴ When the costs of

³¹⁹ See *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402 (1971) (establishing "hard-look" doctrine).

³²⁰ *Id.* at 412 (indicating that consideration of environmental costs and benefits is part of Department of Transportation, rather than EPA, statute).

³²¹ *Id.*

³²² The Environmental Protection Agency must consider cost—including, most importantly, cost of compliance—before deciding whether regulation of power plants under the Clean Air Act is appropriate and necessary. Clean Air Act, § 112(n)(1)(A), 42 U.S.C.A. § 7412(n)(1)(A); *Michigan*, 135 S. Ct. 2699.

³²³ See *King v. Burwell*, 135 S. Ct. 2480 (2015) (providing case that the challenging states cited).

³²⁴ *Id.* at 2488. "When analyzing an agency's interpretation of a statute, we often apply the two-step framework announced in *Chevron*. Under that framework, we ask whether the

regulations are monetized, the benefits typically must be too, as articulated by the Ninth Circuit Court of Appeals.³²⁵ The court concluded that the agency, NHTSA, “cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent standards.”³²⁶

The next step is for the agency to exercise. To start, the Supreme Court in *Arlington v. FCC* held that *Chevron*³²⁷ deference applies to an agency’s interpretation of the scope of its own statutory jurisdiction: “statutory ambiguities will be resolved, within the bounds of reasonable interpretation, not by the courts but by the administering agency.”³²⁸ There is no distinction in terms of deference afforded the agency between an agency’s “jurisdictional” and “non-jurisdictional” interpretations:³²⁹ “[i]f ‘the agency’s answer is based on a permissible construction of the statute,’ that is the end of the matter.”³³⁰

A different presidential administration, by executive action without congressional approval, can change either or both the OMB cost-benefit regulations and/or the substantive EPA Clean Air Act regulations. Executive Order 13771 of the Trump Administration directs that no agency may issue a new rule unless the agency offsets the costs of the new rule by

statute is ambiguous and, if so, whether the agency’s interpretation is reasonable. This approach is ‘premised on the theory that a statute’s ambiguity constitutes an implicit delegation from Congress to the agency to fill in the statutory gaps.’ In extraordinary cases, however, there may be a reason to hesitate before concluding that Congress has intended such an implicit delegation.” *Id.* (citations omitted).

³²⁵ See *Center for Biological Diversity v. National Highway Traffic Safety Administration*, 538 F.3d 1172 (9th Cir. 2008) (indicating that one cannot count lopsided costs or benefits and not the other when setting monetized environmental standards under the Clean Air Act regarding greenhouse gas emissions).

³²⁶ *Id.*

³²⁷ See *Chevron*, 467 U.S. 837 (1984) (establishing test for deference to administrative actions).

³²⁸ *City of Arlington, Texas v. F.C.C.*, 133 S. Ct. 1863, 1868 (2013) (citing *AT&T Corp. v. Iowa Util. Bldg.*, 525 U.S. 366, 397 (1999)).

³²⁹ *Id.* No “exception exists to the normal [deferential] standard of review” for “jurisdictional or legal question[s] concerning the coverage” of an Act. *NLRB v. City Disposal Sys., Inc.*, 465 U.S. 822, 830 n.7 (1984). There is no principled basis for carving out an arbitrary subset of “jurisdictional” questions from the *Chevron* framework. See, e.g., *Nat’l Cable & Telecomm. Ass’n v. Gulf Power Co.*, 534 U.S. 327, 333, 339 (2002) (citing *Chevron*, 467 U.S. at 842-44).

³³⁰ *Arlington*, 133 S. Ct. at 1874-75 (quoting *Chevron*, 467 U.S. at 842). The Supreme Court has afforded *Chevron* deference to agencies’ constructions of the scope of their own jurisdiction. See generally, *Commodity Futures Trading Co. v. Schor*, 478 U.S. 833 (1986); *United States v. Eurodif S.A.*, 555 U.S. 305 (2009).

rescinding at least two existing ones.³³¹ The court found that environmental organizations could not demonstrate standing or injury to challenge this as an unconstitutional regulation violating the Administrative Procedure Act, in 2018.³³²

The executive branch began a process in 2017 to re-evaluate the “benefit” attributed to saving a life or saving emission of CO₂ from coal-fired and other facilities.³³³ At EPA, in mid-2018, the agency released an Advance Notice of Proposed Rulemaking to re-examine all cost and benefit analysis by the agency.³³⁴ The notice notes both the recent *Michigan*³³⁵ and the *Riverkeeper*³³⁶ Supreme Court opinions, which require or permit, respectively, agency consideration of costs.³³⁷ The EPA notice includes that a comment submitted to the Agency “has justified the stringency of a standard based on the estimated benefits from reductions in pollutants not directly regulated by the action (i.e., ‘ancillary benefits’ or ‘co-benefits’).”³³⁸ Things are now again in motion. Coming full circle, fifteen states—Michigan, Alabama, Arizona, Arkansas, Kansas, Kentucky, Nebraska, North Dakota, Ohio, Oklahoma, South Carolina, Texas, West Virginia, Wisconsin, and Wyoming—sued EPA in the Court of Appeals for the District of Columbia in 2016, for re-affirming its MATS rule.³³⁹ Law

³³¹ See *The White House, Presidential Executive Order on Reducing Regulation and Controlling Regulatory Costs*, (Jan. 30, 2017), <https://www.whitehouse.gov/the-press-office/2017/01/30/presidential-executive-order-reducing-regulation-and-controlling> (Providing White House Executive Order on regulation). See also, *Public Citizen, Inc., et al., v. Donald Trump*, Civil Action No. 17-253 (Rdm) (D.C.D.C, 2017) (Case in which Executive Order was challenged).

³³² Challenge to Trump’s 2-for-1 Deregulatory Order Rejected, Bloomberg Environment, Feb. 26, 2018, <https://bna.com/environment-and-energy/challenge-to-trumps-2-for-1-deregulatory-order-rejected>.

³³³ See Gabriel Nelson, *EPA Plans to Revisit a Touchy Topic – the Value of Saved Lives*, GREENWIRE (Jan.18, 2011), <https://www.eenews.net/stories/1059944118> (providing evidence that EPA will re-evaluate the benefit of saving lives).

³³⁴ *Increasing Consistency and Transparency in Considering Costs and Benefits in the Rulemaking Process*, ENV’T L PROT. AGENCY, https://www.epa.gov/sites/production/files/2018-06/documents/cost_and_benefit_consideration_anprm_prepub.pdf?utm_source=Federal+State+Policy+Updates+June+2018&utm_campaign=State+and+Federal+Updates&utm_medium=email.

³³⁵ *Michigan*, 135 S.Ct. at 2705.

³³⁶ *Riverkeeper*, 556 U.S. at 208.

³³⁷ *Id.*

³³⁸ See *Increasing Consistency* *supra* note 334, at 6.

³³⁹ See Petition for Review, *Michigan Attorney General Bill Schuette v. U.S. Env’tl Prot. Agency*, No. 16-1204 (June 24, 2016 D.C. Cir.), <https://www.bloomberglaw.com/>

has now changed so that EPA must consider cost before issuing certain Clean Air Act regulations.³⁴⁰ However, the algorithm and inputs to the cost calculation were not yet before the Court because EPA had not presented a new cost algorithm for the Court to examine.³⁴¹ Thus, this established a new legal requirement, with no details yet on the algorithm for this now legally required undertaking. The mechanism going forward is the next major matter of first impression for the Court. Notwithstanding, *Michigan v. EPA*³⁴² changed the constitutional separation of powers, as well as mandating a quantitative process as part of making law through certain regulation.

public/desktop/document/Michigan_Attorney_General_Bill_Schuette_v_US_Environment
al_Protec?1469159801 (lawsuit brought by states against EPA for reaffirming MATS rule).

³⁴⁰ *Michigan*, 135 S. Ct. at 2711.

³⁴¹ *Id.*

³⁴² *Id.*