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Restorative Justice to Supplement Deterrence-Based Punishment: An Empirical Study and Theoretical Reconceptualization of the EPA's Power Plant Enforcement Initiative, 2000-2011

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RESTORATIVE JUSTICE TO SUPPLEMENT
DETERRENCE-BASED PUNISHMENT: AN
EMPIRICAL STUDY AND THEORETICAL
RECONCEPTUALIZATION OF THE EPA'S POWER
PLANT ENFORCEMENT INITIATIVE, 2000-2011*

MICHAEL L. RUSTAD,** THOMAS H. KOENIG*** & ERICA R. FERREIRA****

Abstract

From the late 1970s to the end of the 1990s, electricity producers modified and operated coal-fired power plants in violation of the Environment Protection Agency's (EPA) permitting requirements, creating widespread air quality degradation. The EPA's policy of lax oversight ended in 1999 when it launched a large, coordinated enforcement effort. The 2012 Republican presidential candidates all denounced this more

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vigilant EPA as engaging in economic terrorism through “sue and settle” tactics that amount to backdoor regulation. This article evaluates federal environmental enforcement, drawing upon objective data from our empirical study of EPA permitting violation settlements for coal-fired power plants entered into between January 1, 2000, and December 31, 2011. The data reveals that the EPA’s enforcement policy reflects a unique jurisprudence that creatively combines both deterrence-based punishment through appropriately levied civil penalties and restorative justice principles in the form of mitigation projects and mandatory injunctions. Other regulatory agencies should consider adopting restorative justice insights in designing remedies for diffuse civil wrongs such as securities fraud, consumer product safety, and unfair or deceptive trade practices.

Introduction

On January 25, 2012, the head of the Environmental Protection Agency’s air enforcement division addressed an American Bar Association seminar, reaffirming the EPA’s intent to continue to “prioritize the enforcement of its new source review permitting program at coal-fired power plants.”¹ A defense attorney countered that the “EPA has been ‘pushing the envelope’ in several recent cases.”² The attorney’s criticism of the EPA was mild compared to that from the candidates for the 2012 Republican nomination for president, all of whom called for either the elimination or significant downsizing of the EPA.³ The American Coalition for Clean Coal

1. Jessica Coomes, *Coal-Fired Plant Enforcement Initiative Remains Priority for EPA, Official Says*, BLOOMBERG BNA (Jan. 25, 2012), <http://www.bna.com/coal-fired-power-plant-n12884907470/> (reporting on webinar sponsored by the American Bar Association Section of Environment, Energy, and Resources).

2. *Id.*

3. Bill Straub, *Republicans Attack ‘Regulatory Reign of Terror’ by EPA*, EVANSVILLE COURIER & PRESS (Jan. 15, 2012, 11:59 PM), http://www.courierpress.com/news/2012/jan/15/no-headline--ev_epa/. Republican presidential candidates unanimously called for either the abolition or downsizing of the EPA:

Republican presidential candidates have viciously attacked the EPA with Rep. Ron Paul, R-TX, calling for its elimination. Former House Speaker Newt Gingrich promotes an overhaul to essentially disembowel the agency and Texas Gov. Rick Perry is promoting changes—prohibiting it from regulating greenhouse gases and various other pollutants—that would render the EPA toothless.

Even former Utah Gov. Jon Huntsman, considered the most moderate candidate in the field and the only contender to maintain that human activity contributes to global warming, has promised to end the “regulatory reign of

Electricity,⁴ an industry lobby, denounces the EPA's new regulations as "the most expensive ever imposed on coal-fueled power plants," costing jobs and significantly raising the price of electricity.⁵ The EPA is increasingly wedged between a rock and a hard place because of the high profile struggle between its duty to enforce the Clean Air Act (CAA) and pushback from the powerful coal-fired plant industry, with the health of the American public being balanced against higher electricity prices.

This rancorous debate over the EPA's enforcement policy generates more heat than light, featuring such inflammatory phrases from Republican leaders as "Obama's war on coal,"⁶ "backdoor regulation,"⁷ and "sue and

terror" at the EPA.

"If you look at the EPA's record, it is increasingly radical," Gingrich said during a Jan. 8 debate in New Hampshire. "It's increasingly imperious. It doesn't cooperate, it doesn't collaborate, and it doesn't take into account economics."

Id.; see also Mitt Romney, *Cutting Red Tape*, WAKEUPAMERICA.COM (Feb. 20, 2012), <http://news.wakeupamerica.com/Our-Experts/Additional-Contributors/Articles/Cutting-Red-Tape.aspx> ("Bizarrely, in the face of our economic travails, the most active regulator is the Environmental Protection Agency . . . [which] continues to issue endless new regulations touching on countless other forms of economic activity—regulations that drive up costs, hinder investment, and destroy jobs.").

4. The American Coalition for Clean Coal Electricity describes itself as:

[A] partnership of the industries involved in producing electricity from coal. Coal is an abundant and affordable energy resource that has provided nearly half of the reliable electricity Americans depend upon each and every day over the past decade. ACCCE supports policies that will ensure affordable, reliable, domestically produced energy, while supporting the development and deployment of advanced technologies to further reduce the environmental footprint of [the] coal-fueled electricity generation—including advanced technologies to capture and safely store CO₂ gases.

AM. COAL. FOR CLEAN COAL ELEC., <http://www.cleancoalusa.org/> (last visited Mar. 24, 2013).

5. *President, EPA to Celebrate Job Destroying Regulations*, AMERICA'S POWER (Jan. 10, 2012), <http://www.americaspower.org/president-epa-celebrate-job-destroying-regulations>. In January 2012, the EPA finalized the Utility MACT (Maximum Achievable Control Technology) rule for coal-fueled power plants. In response, President and CEO of the American Coalition for Clean Coal Electricity, Steve Miller, released the following statement: "The EPA's actions are not a cause for a celebration. Their heavy handed and unnecessary assault on the American economy only serves to destroy jobs by raising the cost of energy and possibly making electricity less reliable." *Id.* (internal quotation marks omitted).

6. *Obama's War on Coal Claims Another 1,200 More Jobs*, GOP.COM (Sept. 18, 2012), <http://www.gop.com/news/research/obamas-war-on-coal-claims-another-1200-more-jobs/>; see also Steve Igo, *GOP Blames Obama's 'War on Coal' for Alpha Job Cuts*, KINGSPORT

settle.”⁸ This article provides the first systematic empirical data regarding the pattern of EPA settlements in its coal-fired plant permitting enforcement initiative over the past eleven years in order to replace politicized rhetoric with a clear understanding of the enforcement initiative. Part I introduces the Clean Air Act’s section 112 New Source Review (NSR) permitting program. After years of inaction, the EPA is engaged in a new millennium initiative to address CAA permitting non-compliance by coal-fired plant owners. Many of the EPA enforcement actions have resulted in settlements, which are the focus of our empirical study in Part II. The second part of this article presents findings from an original objective analysis that employs descriptive statistics and measures of association to examine all EPA final settlements with coal-fired plants for permitting violations in decided cases from January 1, 2000, to December 31, 2011.

Part III argues that the EPA’s enforcement strategy employs a unique jurisprudence that blends the dual goals of deterrence and restorative justice. The polluter is required to pay a penalty for past wrongdoing and to make modifications to reduce its hazardous atmospheric emissions while simultaneously undertaking remediation projects that aim to restore the damaged environment. Restorative justice, applied to civil wrongs, requires companies to commit to restoring the environment to its previous state in order to repair the community’s injury.⁹ Our conclusion is that applying restorative justice to supplement deterrence-based punishment is an unrecognized new enforcement paradigm that should be more widely adopted by other regulatory agencies. Restorative projects to mitigate the harm are particularly appropriate when redressing community-wide

TIMES-NEWS (Sept. 18, 2012, 10:00 PM), <http://www.timesnews.net/article/9051820/gop-blames-obamas-war-on-coal-for-alpha-job-cuts>.

7. *See House, Senate Lawmakers Highlight Concerns with EPA “Sue & Settle” Tactic for Backdoor Regulation*, CANADA FREE PRESS (Jan. 20, 2012), <http://www.canadafreepress.com/index.php/article/44052>.

8. *See id.*

9. John Braithwaite, *A Future Where Punishment Is Marginalized: Realistic or Utopian?*, 46 UCLA L. REV. 1727, 1743 (1999).

Restorative justice is a process of bringing together the individuals who have been affected by an offense and having them agree on how to repair the harm caused by the crime. The purpose is to restore victims, restore offenders, and restore communities in a way that all stakeholders can agree is just.

Id. “Restorative Justice has ancient roots and is described as ‘the dominant model of criminal justice throughout most of human history for all the world’s peoples.’” 1 SARAH R. COLE, CRAIG A. McEWEN, NANCY H. ROGERS, JAMES R. COBEN & PETER N. THOMPSON, *MEDIATION: LAW, POLICY AND PRACTICE* § 15:5 (2011).

probabilistic injuries created by unfair or deceptive trade practices, false advertising claims, dangerously defective products, and securities fraud with diffuse victims.

I. Coal-Fired Plant Modifications Without Obtaining Preconstruction Permits

From 1977 to 1999, the EPA did not initiate a single enforcement action, even though coal-fired plants often flouted their preconstruction permitting obligations.¹⁰ This decades-long period of lax enforcement resulted in the release of massive amounts of air toxins that continue to harm the public health and degrade the air we breathe.¹¹ A recent Abt Associates study concluded that fine particle pollution from existing coal-fired plants was “expected to cause nearly 13,200 deaths in 2010” and to produce total adverse impacts priced at more than \$100 billion per year.¹² Given the gravity of the damage to the environment from not minimizing emissions containing hydrogen chlorides,¹³ dioxins,¹⁴ mercury,¹⁵ and other highly

10. The EPA’s website does not list a single coal-fired plant CAA settlement prior to 2000. *See Coal-Fired Power Plant Enforcement Initiative*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/coal/index.html> (last visited Mar. 24, 2013). To update Roscoe Pound, “The life of the” Clean Air Act “is in its enforcement.” *See* Roscoe Pound, *Mechanical Jurisprudence*, 8 COLUM. L. REV. 605, 619 (1908).

11. *See, e.g., Tennessee Valley Authority Clean Air Act Settlement*, EPA (Apr. 14, 2011), <http://www.epa.gov/compliance/resources/cases/civil/caa/tvacoal-fired.html> (“EPA issued [the Tennessee Valley Authority] an administrative compliance order (ACO) alleging that TVA modified a number of coal-fired units at nine of TVA’s plants without first complying with Clean Air Act (CAA) preconstruction obligations that include obtaining preconstruction permits and installing and operating state-of-the-art pollution control technology.” (citing 42 U.S.C. §§ 7470-92, 7501-15 (2006))).

12. Conrad Schneider & Jonathan Banks, *The Toll from Coal: An Updated Assessment of Death and Disease from America’s Dirtiest Energy Source*, CLEAN AIR TASK FORCE, 4 (Sept. 2010), http://www.catf.us/resources/publications/files/The_Toll_from_Coal.pdf.

13. *See* Letter from Am. Acad. of Pediatrics et al. to Lisa Jackson, EPA Administrator, 3 (Aug. 4, 2011), available at <http://www.lungusa.org/get-involved/advocate/advocacy-documents/epa-mercury-other-health.pdf> (“Hydrogen chloride is a strong acid gas that reacts with moisture to form hydrochloric acid. Hydrogen chloride intensely irritates the mucous membranes of the respiratory system. At high concentrations, hydrogen chloride can cause swelling and spasms in the throat and suffocation. In addition, inhaled hydrogen chloride can lead to a chemical- or irritant-induced form of asthma called Reactive Airway Dysfunction Syndrome (RADS). Both hydrogen chloride and hydrogen fluoride can irritate the eyes, nasal passages, and lungs.” (citations omitted)).

14. *See id.* (“Dioxins and furans are a family of toxic chemicals that primarily arise from the burning of fossil fuels, such as coal, and exist in the atmosphere both as a gas and particles. As particles, they may remain airborne for more than ten days, spreading widely

toxic substances, the failure of deterrence clearly leads to substantial societal harm.¹⁶

The EPA has strengthened regulations governing coal-fired plants in order to protect the public health from excessive, preventable air toxins.¹⁷ Coal-fired plants plainly externalize health care costs, even when nominally complying with federal air permitting requirements. America's coal-fired electricity producing facilities create over "386,000 tons of 84 separate hazardous air pollutants from over 440 plants in 46 states" every year.¹⁸ The specified regulated harmful chemicals, compounds, or groups of compounds emitted from power plants, listed in CAA section 112(b), include the acid gases: hydrogen chloride (HCl) and hydrogen fluoride (HF).¹⁹ Hazardous air pollutant (HAP) metals emitted from coal-fired plants include arsenic (As), cadmium (Cd) and lead (Pb) compounds.²⁰ Organic HAPs include deadly dioxins,²¹ which are considered highly toxic

from their source, and depositing in water and soil. Dioxins have been found in the U.S. food supply; in 2002-2003, the U.S. Department of Agriculture found dioxin-like substances in meat and poultry. Researchers have found dioxins in the breast milk of nursing mothers." (citations omitted)).

15. *See id.* at 5 ("Once released to the atmosphere, mercury returns to the earth in rain or snowfall, and pollutes waterways and the wildlife in them[.] . . . Eating foods containing methylmercury can expose the brains of adults, children and developing fetus[es] to harm. Critical periods are during pregnancy and in the early months after children are born. Mercury exposure can lead to developmental birth defects and interfere with neurological development. Pregnant women who consume fish and shellfish can transmit that methylmercury to their developing fetuses, and infants can ingest methylmercury in breast milk." (citations omitted)).

16. *See id.* ("Non-mercury metals and metal-like substances (e.g. arsenic and selenium) comprise a significant part of fine particulate matter (PM2.5) emitted from coal-fired power plants. These primary particles come in addition to the secondary particles formed as a result of chemical reactions in sulfur dioxide and nitrogen oxide emissions. Those secondary particles, notably sulfates and nitrates, pose similar life-threatening risks.").

17. EPA Issues First National Standards for Mercury Pollution from Power Plants/ Historic 'Mercury and Air Toxics Standards' Meet 20-Year Old Requirement to Cut Dangerous Smokestack Emissions, EPA (Dec. 21, 2011), <http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/bd8b3f37edf5716d8525796d005dd086!opendocument> ("EPA estimates that the new safeguards will prevent as many as 11,000 premature deaths and 4,700 heart attacks a year. The standards will also help America's children grow up healthier—preventing 130,000 cases of childhood asthma symptoms and about 6,300 fewer cases of acute bronchitis among children each year.").

18. *See* Letter from Am. Acad. of Pediatrics et al. to Lisa Jackson, EPA Administrator, *supra* note 13, at 2.

19. *See* 42 U.S.C. § 7412(b)(1) (2006).

20. *See id.*

21. *See id.*

carcinogens.²² Benzene and methyl hydrazine are also HAPs listed in section 112(b).²³ Radionuclides emitted by power plants raise the life-time probability of serious health issues.²⁴

Coal-fired “[power] plants are also the most significant industrial contributors to the nation’s mercury pollution, which causes serious health effects in humans and wildlife.”²⁵ “Mercury is a developmental neurotoxin

22. *Dioxins and Furans*, UNITED NATIONS ENV’T PROGRAMME, http://www.chem.unep.ch/gpa_trial/1_10dio.htm (last visited Mar. 24, 2013) (“The overall toxicity of a dioxin containing mixture is assumed to be the Toxic Equivalent (TEQ) of a stated amount of pure 2, 3, 7, 8-tetrachloro-dibenzo-p-dioxin (TCDD), the most potent, hazardous and well-studied dioxin.”).

23. 42 U.S.C. § 7412(b)(1).

24. DEV., SEC., & COOPERATION POLICY & GLOBAL AFFAIRS NAT’L RESEARCH COUNCIL ET AL., *URBANIZATION, ENERGY, AND AIR POLLUTION IN CHINA: THE CHALLENGES AHEAD* 184 (2004); *see also* Coal-Fired Power Plant Emissions, EPA, <http://www.epa.gov/radtown/coal-plant.html> (last visited Mar. 24, 2013) (“Coal contains trace quantities of the naturally-occurring radionuclides uranium and thorium, as well as their radioactive decay products, and potassium-40. When coal is burned, minerals, including most of the radionuclides, do not burn and concentrate in the ash.”); *THE BIOSPHERE: PROBLEMS AND SOLUTIONS: PROCEEDINGS OF THE MIAMI INTERNATIONAL SYMPOSIUM ON THE BIOSPHERE* 122 (T. Nejat Veziroğlu ed., 1984) (symposium held April 23-24, 1984, at Miami Beach, Fla.) (explaining overall health risks of radionuclides).

25. Nicholas Morales, Case Comment, *New Jersey v. Environment Protection Agency*, 33 HARV. ENVTL. L. REV. 263, 264 (2009).

Electric utility steam generating units (“EGUs” or “power plants”) fueled by coal produce over half of the United States’s [sic] electricity. However, they also emit over 150,000 tons of hazardous air pollutants annually, and, in contributing over forty percent of U.S. anthropogenic mercury emissions, they constitute the single largest source of such emissions. Mercury is an extremely dangerous neurotoxin that can cause neurological damage in developing fetuses and infants, cardiac abnormalities in children, and cardiovascular problems in adults. Mercury emitted into the air as a byproduct of electricity generation eventually settles on land and in water, where it bioaccumulates in the fatty tissue of fish. Humans and wildlife become exposed to mercury when they consume fish in which mercury has accumulated.

Id. at 264 (footnotes omitted); *see also* NESCAUM, *Mercury MACT Under the Clean Air Act: An Assessment of the Mercury Emissions Outcomes of Stakeholder Group Recommendations*, U.S. SENATE COMM. ON ENV’T & PUB. WORKS (May 8, 2003), http://epw.senate.gov/108th/Jeffords_050803_3.htm.

In 1998, the U.S. Environmental Protection Agency (EPA) identified mercury as the hazardous air pollutant of “greatest potential concern” associated with coal-fired electricity production. Moreover, coal-fired power plants were identified as the largest remaining source of airborne mercury emissions in the U.S. following the regulation of other important mercury sources, such as municipal and medical waste incinerators, in the late 1990s.

that is” particularly hazardous to developing fetuses and young children.²⁶ Nitrogen oxides, when combined with volatile organic chemicals, produce long-term lung damage, particularly in children.²⁷ Sulfur dioxide and nitrogen oxides are converted into fine particulate matter once they become airborne.²⁸ These tiny particles are particularly hazardous to children and those with respiration problems because they “can be breathed in and lodged deep in the lungs, leading to a variety of health problems and even premature death,” primarily from lung cancer and cardiac damage.²⁹ The harms from this preventable air pollution are widely distributed throughout American society.

In the twenty-first century, the EPA’s enforcement of permitting laws has shifted sharply away from neglect and toward proactive vigilance. On November 3, 1999, the EPA commenced “one of the largest enforcement investigations in EPA history.”³⁰ The EPA’s post-1999 coordinated campaign targets utilities that modified their plants “without [incorporating] the best available emissions-control technology, [thereby] increasing air pollution near the facilities and far downwind of the plants, along the Eastern Seaboard.”³¹ The EPA prosecutors found that “[power] plants illegally released massive amounts of air pollutants over a period of several years and contributed [to] some of the most severe environmental problems facing the United States today.”³²

Id. (footnote omitted).

26. Keith Harley, *Mercurial but Not Swift—U.S. EPA’s Initiative to Regulate Coal Plant Mercury Emissions Changes Course Again As It Enters a Third Decade*, 86 CHI.-KENT L. REV. 277, 278-79 (2011).

27. See EPA, *NO_x: How Nitrogen Oxides Affect the Way We Live and Breathe*, NAT’L CTR. FOR HEALTHY HOUS., 3 (Sept. 1998), http://www.nchh.org/Portals/0/contents/EPA_Nitrogen_oxides.pdf.

28. See *Northern Indiana Public Service Company Clean Air Act Settlement*, EPA (Jan. 13, 2011), <http://www.epa.gov/compliance/resources/cases/civil/caa/nipsco.html> (“High concentrations of SO₂ affect breathing and may aggravate existing respiratory and cardiovascular disease. Sensitive populations include asthmatics, individuals with bronchitis or emphysema, children and the elderly. Sulfur dioxide is also a primary contributor to acid deposition, or acid rain.”).

29. *Id.*

30. Press Release, U.S. Dep’t of Justice, U.S. Sues Electric Utilities in Unprecedented Action to Enforce the Clean Air Act (Nov. 3, 1999), available at <http://www.justice.gov/opa/pr/1999/November/524enr.htm> (internal quotation marks omitted).

31. *Id.*

32. *Coal-Fired Power Plant Enforcement Initiative*, *supra* note 10 (describing deleterious public health impact caused by power plant’s failure to meet their New Source Review permitting requirements).

A. The EPA's Permitting Requirements for Coal Fired Plants

1. The 1977 Clean Air Act Amendments & Permitting Violations

The Clean Air Act is considered one of the murkiest federal statutes because of its stunning complexity and convoluted history of amendments.³³ Under the 1970 CAA amendments, Congress added “new source performance standards” (NSPS) authorizing the EPA Administrator to apply these standards to stationary sources such as coal-fired plants.³⁴ New sources include any “modification of which is commenced after the publication of regulations (or, if earlier, proposed regulations) prescribing a standard of performance under this section which will be applicable to such source.”³⁵

The 1974 CAA regulations expressly clarified that existing coal-fired plants were subject to EPA regulations if the plants made any major modifications to their facilities.³⁶ The CAA created new “requirements for preconstruction permits for new and modified major stationary sources,” known as the “new source review (NSR) program.”³⁷ The NSR program consists of two standards for review: Prevention of Significant Deterioration (PSD) for regions that have attained air quality standards and Non-attainment New Source Review (NNSR) for regions that have not attained air quality standards.³⁸ The EPA's PSD program was “implemented through preconstruction reviews of new or modified sources of sulfur dioxide and particulate matter.”³⁹ The NSR rules were open to

33. See 1 WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW: AIR AND WATER § 3.1A(A) (2012) (“The Act consumes 313 pages in the Statutes at Large, nearly 10 times the length of the original *Clean Air Act* of 1970 . . .”). See generally *The Clean Air Act: What You Need to Know*, FOLEY & LARDNER LLP (Apr. 30, 2004), http://www.foley.com/publications/pub_detail.aspx?pubid=2070 (describing the statute's myriad provisions).

34. See 42 U.S.C. § 7211(b)(1)(A), (j)(1)(A)(iv) (1994) (repealed 1996).

35. 42 U.S.C. § 7411(a)(2) (2006).

36. The EPA Administrator released final regulations in December 1974 “amending each state plan to include a [Prevention of Significant Deterioration] PSD requirement. The new PSD program implemented through preconstruction reviews of new or modified sources of sulfur dioxide and particulate matter.” *Ala. Power v. Costle*, 636 F.2d 323, 347 (D.C. Cir. 1979) (footnote omitted).

37. ARNOLD W. REITZE, JR., AIR POLLUTION CONTROL LAW: COMPLIANCE AND ENFORCEMENT 177 (2001).

38. *National Enforcement Initiatives for Fiscal Years 2008 - 2010: Clean Air Act: New Source Review/Prevention of Significant Deterioration*, EPA, <http://www.epa.gov/oecaerth/data/planning/priorities/caansrpsd.html> (last visited Mar. 24, 2013).

39. *Costle*, 636 F.2d at 347 (defining significant deterioration “in terms of allowable numerical increases in the concentration of sulfur dioxide and particulate matter in areas

interpretation as to what constituted a major modification, rather than an alteration made as part of a process of routine maintenance.⁴⁰ The energy industry seized upon this definitional indeterminacy as a defense against any EPA enforcement action.⁴¹

where ambient pollution levels were presumed by the regulations to be lower than those mandated by primary and secondary NAAQS”); *see also* Third Amended Intervenor Complaint ¶ 47, *United States v. Am. Elec. Power Serv. Corp.*, No. C2-99-1182 (S.D. Ohio filed Sept. 17, 2004) (“Pursuant to 42 U.S.C. § 7409, the Administrator of the [EPA] has promulgated regulations establishing primary and secondary national ambient air quality standards (‘NAAQS’ or ‘ambient air quality standards’) for certain criteria air pollutants, including ozone and SO₂. The primary NAAQS are to be adequate to protect the public health, and the secondary NAAQS are to be adequate to protect the public welfare, from any known or anticipated adverse effects associated with the presence of the air pollutant in the ambient air.”).

40. JAMES E. MCCARTHY, CONG. RESEARCH SERV., RL 30853, CLEAN AIR ACT: A SUMMARY OF THE ACT AND ITS MAJOR REQUIREMENTS 12, <http://www.fpc.state.gov/documents/organization/47810.pdf> (last updated May 9, 2005) (“The standards also apply to modifications of existing facilities, through a process called New Source Review (NSR). The law’s ambiguity regarding what constitutes a modification (subject to NSR) as opposed to routine maintenance of a facility has led to litigation, with EPA recently proposing to modify its interpretation of the requirements of this section.”).

41. Congress compounded the difficulty by creating uncertainty as to the meaning of new and modified sources. The D.C. Circuit noted how Congress failed to even refer to modifications beyond the NNSR portion of the CAA amendments:

Due to a technical defect, however, Congress initially achieved this goal only in the NNSR portion of the amendments, which defined modification by reference to the NSPS definition: “The terms ‘modifications’ and ‘modified’ mean the same as the term ‘modification’ as used in section 7411(a)(4) of this title.” By contrast, the PSD portion of the amendments applied initially to new sources only. Congress corrected this in a technical amendment passed several months later, which applied the PSD program to sources that were to undergo modifications “as defined in section 7411(a) of this title.”

New York v. U.S. EPA, 413 F.3d 3, 13 (D.C. Cir. 2005) (*per curiam*) (citation omitted). The CAA amendments’ murkiness reduced the ability of the EPA to enforce the rules.

EPA’s bargaining power was no doubt substantially reduced by the Agency’s determination to eliminate the Clean Air Act New Source Review revisions that its own staff was trying to enforce. Industry lawyers correctly calculated that the resulting confusion—in the courts, as well as at EPA—opened the door to endless litigation that, at worst, would allow their clients to postpone cleanup and minimize penalties. Cases that might have settled years ago are still in court. For example, the Justice Department announced in December of 2000 that the Cinergy Corporation had agreed to settle NSR violations, and would spend \$1.4 billion to clean up its power plants and pay an \$8.5 million fine. That agreement was shelved in 2001, after EPA announced proposed rule changes, and the case has been in litigation for nearly seven years.

2. Defining a Major Modification That Triggers a CAA Permitting Obligation

Prior to its twenty-first century enforcement efforts, the EPA was widely criticized for overly lax oversight of pollution sources.⁴² Historically, the EPA had a *de facto* policy of letting “serious violators walk away with the equivalent of a slap on the wrist.”⁴³ The EPA’s passivity allowed “widespread noncompliance” with permitting requirements, which seem less ambiguous than the utilities have claimed.⁴⁴ A major modification⁴⁵ is

Eric V. Schaeffer, *Paying Less to Pollute: Environmental Enforcement under the Bush Administration*, A.L.I.-A.B.A. COURSE OF STUDY: CLEAN AIR: LAW, POLICY, & PRACTICE (Nov. 2007) (footnote omitted).

42. See *EPA Must Improve Oversight of State Enforcement*, EPA (Dec. 9, 2011), <http://www.epa.gov/oig/reports/2012/20111209-12-P-0113.pdf> (“EPA does not consistently hold states accountable for meeting enforcement standards, has not set clear and consistent national benchmarks, and does not act effectively to curtail weak and inconsistent enforcement by states.”). During the formative period of the EPA, the agency was reluctant to impose substantial penalties on violators, as in the following example:

[A] small firm emitting dangerous levels of lead pollution succeeded in evading detection for nine years through the simple expedient of failing to apply for an emissions permit, and, after its chance detection, continued to pollute under the threat of a \$25,000 per day fine until reaching a negotiated settlement costing a tiny fraction of its maximum possible fine of \$25,000,000.

Reinier H. Kraakman, *Corporate Liability Strategies and the Costs of Legal Controls*, 93 YALE L.J. 857, 882-83 n.74 (1984).

43. David L. Markell, *The Role of Deterrence-Based Enforcement in a “Reinvented” State/Federal Relationship: The Divide Between Theory and Reality*, 24 HARV. ENVTL. L. REV. 1, 3 (2000); see also Barry Boyer & Errol Meidinger, *Privatizing Regulatory Enforcement: A Preliminary Assessment of Citizen Suits Under Federal Environmental Laws*, 34 BUFF. L. REV. 833, 879 (1985) (arguing that federal enforcement is feeble).

44. Markell, *supra* note 43, at 56. In 1999, the EPA “dramatically step[ped] up its enforcement of new source review, contending that *past* repairs at many coal-fired power plants triggered new source permitting standards.” David B. Spence, *Coal-Fired Power in a Restructured Electricity Market*, 15 DUKE ENVTL. L. & POL’Y F. 187, 205 (2005) (explaining how the EPA stepped up enforcement against coal-fired plants after a long hiatus of non-enforcement).

The last decade has seen a series of fierce, protracted battles over the regulation of air pollution from coal-fired power plants in the United States. These battles have been (and are being) waged by electric utilities, environmental groups, and the last two presidential administrations, among others, before courts, agencies and Congress.

Id. at 187.

45. “New Source Review” covers both new coal-fired plant contraction and modifications of “major” sources. The EPA has promulgated regulations to implement the NSR program permitting requirements that apply to “major modifications.” 40 C.F.R. §§

the predicate for a NSR permit under the CAA,⁴⁶ creating the duty to install pollution controls that minimize air toxins.⁴⁷

The CAA's 1970 amendments require new or modified (or improved) major stationary sources of air pollution to comply with its NSR program.⁴⁸ The CAA defines "modification" to mean any change to a stationary source that "increases the amount of any air pollutant emitted by such source" or leads to the emission of any new pollutant.⁴⁹ A coal plant is a "stationary source" in that it is a "building, structure, facility, or installation which emits or may emit any air pollutant."⁵⁰ The 1977 amendments drew upon this preexisting definition stating, "[A] source undertakes a modification when 'any physical change . . . or change in the method of operation . . . which increases the amount of any air pollutant emitted by such source' occurs."⁵¹ A "major modification" occurs if a project significantly increases total annual emissions at the overall source, calculated using representative

51.166(i), 52.21(i) (2012). A "major modification" occurs if the project significantly increases total annual emissions at the overall source, calculated using representative hours of operation. 40 C.F.R. § 51.166(b)(2)-(3), (21).

46. *New York v. U.S. EPA*, 413 F.3d at 10 ("Among other things, these amendments directed that major stationary sources undertaking modifications must obtain preconstruction permits, as must major new sources, through a process known as 'New Source Review' ('NSR') According to a preexisting definition referenced in the 1977 amendments, a source undertakes a modification when 'any physical change . . . or change in the method of operation . . . which increases the amount of any air pollutant emitted by such source' occurs" (quoting 42 U.S.C. § 7411(a)(4) (2000)) (alterations in original)); *see also* *United States v. Duke Energy Corp.*, 411 F.3d 539, 543 (4th Cir. 2005).

47. 40 C.F.R. §§ 7475(a)(1), 7479(2)(c), 7503(a).

48. Office of Legal Policy, U.S. Dep't of Justice, *New Source Review: An Analysis of the Consistency of Enforcement Actions with the Clean Air Act and Implementing Regulations*, at i (Jan. 2002), *available at* <http://www.epa.gov/compliance/resources/cases/civil/caa/doj-nsrreport.pdf>. The CAA Amendments of 1970 state:

The term "major source" means any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants. The Administrator may establish a lesser quantity, or in the case of radionuclides different criteria, for a major source than that specified in the previous sentence, on the basis of the potency of the air pollutant, persistence, potential for bioaccumulation, other characteristics of the air pollutant, or other relevant factors.

42 U.S.C. § 7412(a)(1).

49. 42 U.S.C. § 7411(a)(4).

50. *Id.* § 7411(a)(3).

51. *New York v. U.S. EPA*, 413 F.3d at 10 (alterations in original) (quoting 42 U.S.C. § 7411(a)(4) (2000)).

hours of operation.⁵² New coal-fired plants are not permitted to commence construction if their emissions would cause or contribute to air quality degradation.⁵³

The 1977 amendments required PSD review of “19 major sources which emit, or have the potential to emit, 100 tons per year or more of any pollutant.”⁵⁴ The PSD also applied to other sources “having the potential to emit 250 tons per year or more of any pollutant.”⁵⁵ The CAA exempted extant electricity generating units (EGUs) such as coal-fired plants from its permitting requirements.⁵⁶

52. 40 C.F.R. § 51.166(b)(2)-(3), (21) (2012) (defining contours of a major modification).

53. *National Enforcement Initiatives for Fiscal Years 2008 - 2010: Clean Air Act: New Source Review/Prevention of Significant Deterioration*, *supra* note 38 (“New Source Review consists of two programs: prevention of significant deterioration in air quality and non-attainment with air quality standards (NSR). New and modified sources in areas, where the air quality meets existing standards, and in unclassifiable areas, are required to follow PSD rules. This means that facilities that emit air pollutants regulated under the Clean Air Act must obtain a pre-construction permit, demonstrate that the construction will not increase emissions above a certain threshold, and show that facility operations are in continuous compliance with the best available control technology (BACT) requirements. In non-attainment areas, where the air does not meet minimum air quality standards, new and modified sources must obtain pre-construction permits, to offset emission increases with emission reductions from other sources in the area, and to meet the lowest achievable emissions rate (LAER).”). The 1977 amendments to the Clean Air Act (CAA) required “sources seeking NNSR [Nonattainment New Source Review] permits [to] meet stricter requirements than sources seeking PSD [Prevention of Significant Deterioration] permits.” *New York v. U.S. EPA*, 413 F.3d at 13. For example, a stationary source seeking a NNSR permit “must achieve the ‘lowest achievable emission rate’ (‘LAER’) for new or modified units, whereas sources seeking PSD permits need only use the less demanding ‘best available control technology’ (‘BACT’).” *Id.* “To obtain PSD permits, sources must undergo ambient air quality analyses to show that they will neither violate NAAQS increments nor adversely affect air quality in national parks or other areas that EPA has designated as needing particularly high-quality air.” *Id.* (citing 42 U.S.C. § 7475 (2000)).

54. *Ala. Power Co. v. Costle*, 636 F.2d 323, 350 (D.C. Cir. 1979).

55. *Id.*

56. *See New York v. U.S. EPA*, 413 F.3d at 13 (observing that Congress compromised when making only new or modified facilities subject to the New Source Review permitting requirements). Plant operators of older coal-fired plants were thus not required to retrofit their EGUs “with additional pollution control technology, such as scrubbers.” *United States v. Ohio Edison Co.*, No. 2:99-CV-1181, 2003 U.S. Dist. LEXIS 25464, at *9 (S.D. Ohio Jan. 22, 2003).

B. The CAA Permitting Process

The states are responsible for implementing the NSR and PSD programs.⁵⁷ The PSD portion of NSR “is a permit program designed to minimize emissions from new sources and existing sources making major modifications.”⁵⁸ The 1990 CAA amendments⁵⁹ required the states “to

57. *New Source Review Permits*, EPA, <http://yosemite.epa.gov/R10/Airpage.nsf/webpage/New+Source+Review+Permits/> (last visited Mar. 24, 2013) (“In many cases the federal NSR programs are implemented by delegated or approved State/local/tribal air agencies. The Region 10 Office advises and assists states, local governments, and tribes on matters relating to the development and implementation of NSR, and takes rulemaking action to approve or disapprove state, local, and tribal implementation of the federal programs.”); *see also* Memorandum from Stephen D. Page, Dir., EPA, to Michael Kenyon, Region 1, EPA, et al., 1, available at <http://www.epa.gov/NSR/guidance.html> (noting that states implement the New Source Review Program).

58. *Fact Sheet—Proposed Rule: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule*, EPA, <http://www.epa.gov/NSR/fs20090930action.html> (last visited Mar. 24, 2013). The NSR permitting program is divided into two programs: one for Prevention of Serious Deterioration (PSD) in attainment areas and another for Nonattainment New Source Review (NNSR) in nonattainment areas (NAs), applicable to areas that fail to meet the National Ambient Air Quality Standards (NAAQS). Justice Souter explained:

Congress added two air pollution control schemes to the Clean Air Act: New Source Performance Standards (NSPS) and Prevention of Significant Deterioration (PSD), each of them covering modified, as well as new, stationary sources of air pollution. The NSPS provisions define the term “modification,” while the PSD provisions use that word “as defined in” NSPS.

Env'tl. Def. v. Duke Energy Corp., 549 U.S. 561, 565-66 (2007) (citation omitted). The PSD requirements apply to areas that comply with NAAQS. In contrast, NNSR applies to nonattainment areas. A federal court described these opaque statutory provisions:

In 1977, the CAA was amended to include two additional source programs, the Prevention of Significant Deterioration [“PSD”] and the Non-Attainment New Source Review Requirements [“NNSR”]. PSD applies to all new emissions capacity in areas meeting NAAQS and NNSR applies to all new emissions capacity in areas not in compliance with NAAQS, i.e., nonattainment areas. The PSD and NNSR provisions are collectively referred to as the New Source Review [“NSR”] Program. The NSR provisions apply to both new and “modified” sources of air pollution. The provisions require “major emitting facilities” to obtain permits prior to construction as well as installation of state of the art pollution control technology under the direction of the permitting agency. . . .

. . . .
The definition of “modification” used in the NSPS provisions applies to the NSR provisions.

United States v. Ohio Edison Co., 276 F. Supp. 2d 829, 849-50 (S.D. Ohio 2003) (alterations in original) (citation omitted). In addition, the NSR provisions make exemptions for “routine maintenance, repair and replacement” as those terms are used in the NSPS provisions. *Id.* at 850 (quoting 40 C.F.R. § 52.21(b)(2)(iii)(a) (2003) (internal quotation marks omitted)).

administer a comprehensive permit program for the operation of sources emitting air pollutants.”⁶⁰ States exempt existing power plants but utilities are subject to state permitting when they refurbish or modify their electricity generating units.⁶¹

New power plants must implement “MACT [maximum achievable control technology]—and *not* BACT [best available control technology]— . . . to a coal-fired plant’s emissions of hazardous pollutants like mercury.”⁶² A major stationary source, for example, must install the BACT for an attainment pollutant or achieve the Lowest Achievable Emission Rate (LAER) in a nonattainment area.⁶³ The EPA describes preconstruction

59. The amendments are as follows:

The principal changes to the Clean Air Act wrought by the Congress in 1990 address the subjects of nonattainment (tit. I, 72 pages), mobile sources (tit. II, 60 pages), hazardous air pollutants (tit. III, 53 pages), acid deposition control (tit. IV, 50 pages), permits (tit. V, 13 pages), stratospheric ozone protection (tit. VI, 24 pages), and enforcement (tit. VII, 13 pages).

1 WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW AIR AND WATER § 3:1B (Supp. 2012).

60. MCCARTHY, *supra* note 40, at 15.

61. See Karl A. Karg, *EPA is Taking a More Aggressive Role in Clean Air Act Enforcement Against Owners of Coal-Fired Generating Units, Including the Targeting of Municipalities for “Informal” Enforcement Negotiations*, LATHAM & WATKINS LLP, 1 (Dec. 8, 2010), <http://www.lw.com> (search for “Client Alert 1108”; then follow “EPA is Taking a More Aggressive Role in Clean Air Act Enforcement” hyperlink) (“Many coal-fired facilities in the Eastern half of the country contain ‘vintage’ coal-fired units dating back to the 1950’s or 1960’s, and these units were essentially grandfathered into the Clean Air Act’s permitting scheme under the PSD/NSR provisions. The theory behind the grandfathering scheme is that at some date certain, these older units will reach the end of their useful lives and not be functional unless they undergo ‘major modifications.’ Once this point is reached and a ‘major modification’ occurs, PSD/NSR review is triggered and the older unit is subject to BACT. If, however, the unit is merely maintained in a ‘routine’ manner (routine maintenance, repair and replacement (RMRR)), PSD/NSR review is not triggered.”); Spence, *supra* note 44, at 195 (stating that plants grandfathered by the CAA regulations, “many of them in the Midwest, continued to pollute at essentially unregulated rates long after the passage of the Act, depositing acid rain and other pollution on downwind states”).

62. *Sierra Club, Inc. v. Sandy Creek Energy Assocs., L.P.*, 627 F.3d 134, 140 n.8 (5th Cir. 2010); see, e.g., Christina C. Caplan, Comment, *The Failure of Current Legal and Regulatory Mechanisms to Control Interstate Ozone Transport: The Need for National Legislation*, 28 *ECOLOGY L.Q.* 169, 186 (2001) (“The complaints allege that the companies made major modifications at their plants that triggered NSR permitting requirements, but that the companies failed to apply for the necessary permits and to install ‘best available control technology’ (BACT) as required under the NSR program.”).

63. The EPA describes:

New Source Review [as consisting] of two programs: prevention of significant deterioration in air quality and non-attainment with air quality standards (NSR).

permits as regulating “air emissions control requirements that apply to a facility, such as national emissions standards for hazardous air pollutants, new source performance standards, or best available control technologies required by a PSD permit.”⁶⁴ A coal-fired plant modifying its EGU must fulfill eight steps:

- (1) a permit setting forth emission limitations must be issued;
- (2) the proposed permit [must be] analyzed and a public hearing . . . held;
- (3) the owner must demonstrate that emissions will not increase emissions (using several parameters);
- (4) [the owner must] ensure that the proposed facility is subject to the best available control technology (“BACT”) for pollutants;
- (5) [the owner must] comply with those BACT provisions;
- (6) [the owner must] study projected impacts that may result from the growth of the facility;
- (7) the owner/operator must agree to monitor to determine the effect of emissions from the facility;
- and (8) [the owner must attain] certain approval that is not relevant to this case.⁶⁵

New and modified sources in areas, where the air quality meets existing standards, and in unclassifiable areas, are required to follow PSD rules. This means that facilities that emit air pollutants regulated under the Clean Air Act must obtain a pre-construction permit, demonstrate that the construction will not increase emissions above a certain threshold, and show that facility operations are in continuous compliance with the best available control technology (BACT) requirements. In non-attainment areas, where the air does not meet minimum air quality standards, new and modified sources must obtain pre-construction permits, to offset emission increases with emission reductions from other sources in the area, and to meet the lowest achievable emissions rate (LAER).

National Enforcement Initiatives for Fiscal Years 2008 - 2010: Clean Air Act: New Source Review/Prevention of Significant Deterioration, *supra* note 38. The Clean Air Act requires:

[A state] to designate those areas within its boundaries where the air quality is better or worse than the NAAQS for each criteria pollutant, or where the air quality cannot be classified due to insufficient data. An area that meets the NAAQS for a particular pollutant is termed an “attainment” area; one that does not is termed a “non-attainment” area.

Third Amended Intervenor Complaint ¶ 49, *United States v. Am. Elec. Power Serv. Corp.*, No. C2-99-1182 (S.D. Ohio Sept. 17, 2004).

64. *Fact Sheet—Proposed Rule: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule*, *supra* note 58.

65. *United States v. La. Generating, LLC*, No. 09-100-JJB-CN, 2011 U.S. Dist. LEXIS 137973, at *6 (M.D. La. Dec. 1, 2011) (citing 42 U.S.C. § 7475(a)(1)-(8) (2006)).

Coal-fired plants that undertake major modifications to their facilities easily exceed the CAA regulation's threshold of emitting at least "100 tons per year of any regulated pollutant, plus stationary and area sources" or emit smaller amounts of certain specified hazardous air pollutants.⁶⁶ Emission limitations depend, in part, upon whether the source is located in an attainment area or nonattainment area.⁶⁷ A coal-fired plant located in a nonattainment area may be subject to NNSR permitting even if it "emit[s] as little as 50, 25, or 10 tons per year."⁶⁸

The EPA mounted its nationwide civil punishment campaign against the coal-fired plants only after alternative legislative or enforcement strategies failed.⁶⁹ The goals of the EPA enforcement initiative were to improve air quality, "reduce illness, protect lakes and streams," and restore the environment.⁷⁰ Our permitting violations study, presented in Part II of this article, is the first statistical analysis of penalties, civil mitigation, and compliance costs for consent decrees and settlements entered into under the EPA's coal-fired plant enforcement initiative.

In every EPA settlement in this study, the electricity generator agreed to reparative or restorative projects to address the harm it had caused to the public. One of the earliest cases arising out of the EPA's coal-fired plant enforcement initiative, for example, was the 2003 settlement agreement with Alcoa.⁷¹ The EPA required Alcoa to undertake injunctive relief valued at \$330 million, including retrofitting an existing plant with state-of-the-art

66. MCCARTHY, *supra* note 40, at 15.

67. If a coal-fired plant is seeking a NNSR (Non-attainment New Source Review) permit, it "must meet stricter requirements than sources seeking PSD permits." *New York v. U.S. EPA*, 413 F.3d 3, 13 (D.C. Cir. 2005) (per curiam). Sources seeking NNSR permits "must achieve the 'lowest achievable emission rate' ('LAER') for new or modified units, whereas sources seeking PSD permits need only use the less demanding 'best available control technology' ('BACT')." At a minimum, LAER and BACT are as restrictive as NSPS." *Id.* (citing 42 U.S.C. § 7479(3) (2000)).

68. MCCARTHY, *supra* note 40, at 15.

69. See *The Power Plant Enforcement Effort*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/tvacoal-fired.html#powerplant> (last visited Mar. 24, 2013) ("The total combined sulfur dioxide and nitrogen oxides emission reductions secured from these settlements will be well over 2 million tons each year once all the required pollution controls have been installed and when other required actions (such as unit retirements) have been implemented.")

70. Complaint at 2, *Sierra Club v. Duke Energy Ind., Inc.*, No. 108CV00437 (S.D. Ind. Apr. 3, 2008), 2008 WL 2548888; see also Complaint at 2, *United States v. Alcoa Inc.*, No. 103CV00222 (W.D. Tex. Apr. 9, 2003) 2003 WL 25757481.

71. *Alcoa, Inc. Clean Air Act Settlement*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/alcoa.html> (last visited Mar. 24, 2013).

pollution controls to eliminate sulfur dioxide.⁷² Alcoa also agreed to pay \$1.5 million to the United States Treasury.⁷³

The Alcoa settlement incorporated concepts of restorative justice in addition to deterrence. Under the consent decree, Alcoa provided \$2.5 million to fund environmental projects such as retrofitting school buses in Texas with pollution control devices.⁷⁴ In addition, Alcoa agreed to provide \$1.75 million to the Trust for Public Lands to purchase and maintain property, to protect clean air, and to safeguard habitats for wildlife.⁷⁵ Alcoa's creation of wildlife habitats exemplifies a polluting utility agreeing to fund environmental projects, thus achieving restorative justice's goals of reparation and reconciliation.⁷⁶

II. Empirical Study of EPA Final Settlements with Coal-Fired Plants

A. Methodology for Coal-Fired Plants Permitting Violations Study

From the late 1970s through the 1990s, the coal-fired electricity industry often bypassed the costly permitting process when retrofitting power plants, thus circumventing its obligation to secure permits and minimize toxins. In the wake of this industry-wide defiance, on November 3, 1999, the United States Department of Justice and the EPA began their enforcement campaign by filing complaints against seven different utility giants.⁷⁷ Our

72. *Id.* (“On April 9, 2003, the Environmental Protection Agency and Department of Justice announced a major Clean Air Act settlement with Alcoa, Inc., under which the company will likely spend over \$330 million to install state-of-the-art pollution controls to eliminate the vast majority of sulfur dioxide and nitrogen oxide emissions from the power plant at Alcoa’s aluminum production facility in Rockdale, Texas.”).

73. *Id.*

74. *Id.*

75. *Id.* (requiring Alcoa to set aside “\$1.75 million to the Trust for Public Lands, a national conservation organization, to purchase and maintain property designed to extend and protect the clean air, and the existing Houston toad habitat of the ‘Lost Pines[.]’”).

76. The mediation projects that the coal-fired plants undertook were reparative. “With restorative justice, the verdict of punishment as a sign of counterfactual stabilisation [sic] of the norm finds a ‘functional equivalent’ in the compensation, or restoration of the damages and sufferings inflicted on the aggrieved party.” BRUNILDA PALI & CHRISTA PELIKAN, BUILDING SOCIAL SUPPORT FOR RESTORATIVE JUSTICE: MEDIA, CIVIL SOCIETY AND CITIZENS 19 (2010), available at <http://www.euforumrj.org/Projects/Final%20Report%20BSS.pdf>. The public health harms are diffuse, statistical, and probabilistic, so it is difficult to have the true interaction between perpetrator and victim. Thus, the EPA settlements are a proxy for restorative justice augmenting civil penalties.

77. These actions were filed against major industry players including American Electric Power Company, Cinergy, FirstEnergy, Illinois Power, Southern Indiana Gas & Electric

empirical study analyzes all twenty-two final settlements with the EPA and the Department of Justice that resolved all claims where a utility failed to obtain a permit before making major modifications.⁷⁸ These consent decrees and settlements for permitting violations were resolved between January 1, 2000, and December 31, 2011.⁷⁹

Each of these final settlements consisted of three components: (1) EPA civil penalties, (2) required mitigation projects, and (3) the cost of complying with injunctions.⁸⁰ Means, medians, and modes were calculated for each component of the final settlement.⁸¹ The study provides a baseline

Company, Southern Company and Tampa Electric Company. *Coal-Fired Power Plant Enforcement Initiative*, *supra* note 10.

78. *See id.* (presenting civil judicial complaints, notices of violations, and administrative orders for coal-fired plant defendants).

79. *See id.* The Statistical Package for the Social Sciences (SPSS) was used to compute all empirical findings. IBM® SPSS® Statistics is a comprehensive set of data and predictive analytics tools used by social scientists, data analysts, and statistical programmers. To conduct our research, we completed a content analysis of every consent decree and settlement published by the EPA on its coal-fired plant initiative. In addition, we coded information such as the year, state, aggravated misconduct, and tons of pollutants reduced by the final settlements, as well as computed the size of the civil penalty assessed, cost of mitigation projects, cost of injunctive relief, and a grand total of these financial costs of noncompliance with EPA permitting regulations. When we coded the United States Department of Justice consent decrees and settlements, we employed the most conservative measures. We did not make adjustments for inflation over the past ten years. If the EPA reported a range for the cost of mitigation projects or injunctive relief, we reported the lowest value on the range. If a given component of recovery was not reported, we recorded “zero” even though this conservative assumption underestimates the costs. Our findings on the size of past civil penalties, mitigation projects, and injunctive relief reflect a complete universe, rather than a statistical sample, of decided cases.

80. All twenty-two coal-fired plants had violated the Clean Air Act’s Prevention of Significant Deterioration/Nonattainment New Source Review provisions, 42 U.S.C. §§ 7470-92, 7501-15. These provisions require plant owners to obtain permits and implement pollution technology controls to minimize air toxics. *See* 42 U.S.C. §§ 7470-92, 7501-15 (2006).

81. The mean (average), median, and mode are the measures of central tendency generally used in statistical analysis. The mean is the average value in a distribution, whereas the mode is the most frequent score in a data set. The median is the value that divides the distribution exactly into halves—50% are below it, and 50% are above it. The median may not actually occur in the distribution, but is the “balance point” of the distribution. The principal advantage of the median is that it is unaffected by outliers, as the mean is and the mode can be. In distributions that are clearly skewed, such as the cost of injunction compliance, the median provides a better estimate of what the typical penalty is. For example, a single multi-billion dollar award will inflate the averages (mean) but will have little impact on the midpoint (median). The mode did not offer a useful measure of central tendency in such a small sample, but was reported when it shed light on the data.

that may be employed by courts when calibrating civil penalties, mitigation costs, and injunctive relief in future enforcement actions.⁸² Appendix A lists all twenty-two settling companies by name, aggravating circumstances, size of civil penalties, cost of mitigation, cost of compliance with the injunction, and federal court citation for each coal-fired plant violator.⁸³

B. Empirical Findings on the EPA's Final Settlements with Utilities

The twenty-two settling utilities consisted of three government owned, fourteen investor owned, and five cooperative or nonprofit utility owned entities. For the twelve cases where megawatt capacities (MW) were reported, the coal-fired plants ranged from 212 to 27,000 megawatts. The agreed upon reductions in tons of air contaminants (not hazardous pollutants but rather conventional pollutants) ranged from 1845 tons per year to 231,000 tons per year. Table 1 presents three measures of central tendency (mean, median, and mode) for the three parts of each consent or settlement agreement: (1) amount allocated to civil penalties; (2) cost of civil mitigation penalties ordered by the court; and (3) cost to the defendant utility of complying with ordered injunctive relief. Many of these coal-fired plant cases required utilities to pay hundreds of millions of dollars, which sends a clear deterrent message.

FINDING #1: SETTLEMENTS AVERAGED MORE THAN \$760
MILLION

Table 1 illustrates why EPA enforcement is a hot button issue for the electricity industry. The twenty-two settlements cost the defendants a total of more than \$16.7 billion. The mean (average) total cost (civil penalty plus mitigation costs plus injunctive costs) for the twenty-two settlements was

82. We also compiled data on tons of air toxics reduced in these cases and its association with the size of the remedy. The permitting violation database also contains information on the year of the penalty, state or jurisdiction, type of air toxics emitted, and any aggravating circumstances. Our empirical research uncovered no cases where a coal-fired plant or other utility had been assessed fines for failing to seek a MACT determination because most coal-fired plants were grandfathered in and had no requirement to comply with CAA section 112 until they undertook major modifications. Professor Hsu explains that the problem with grandfathering is that it creates a regulatory environment where extant facilities have "an incentive to keep old, grandfathered facilities up and running." Shi Ling Hsu, *What's Old Is New: The Problem With New Source Review*, REGULATION, Spring 2006, at 36, 38, available at <http://www.cato.org/pubs/regulation/regv29n1/v29n1-1.pdf>.

83. A comprehensive account of each of the consent decrees and settlements is found at *Coal-Fired Power Plant Enforcement Initiative*, *supra* note 10.

\$762.1 million, over three quarters of a billion dollars per settlement. The median cost of complying with the injunction was \$368.5 million. These substantial costs do not take into account the utilities' legal expenses such as attorney's fees, payments to experts, and other litigation costs.

Table 1: Final Settlement or Consent Orders for Failure to File CAA Permits⁸⁴

	Civil Penalty Imposed in Decree	Mitigation Projects Cost	Estimated Cost of Compliance with Injunction	Grand Total
N Valid	22	22	22	22
Missing	0	0	0	0
Mean	\$3,590,909	\$27,990,909	\$730,681,818	\$762,145,454
Median	\$1,875,000	\$6,125,000	\$368,500,000	\$375,600,000
Mode	\$850,000	\$2,500,000	0	14,000,000
Sum	\$79,000,000	\$615,800,000	\$16,075,000,000	16,767,200,000

(Source: EPA Coal-Fired Plant Enforcement Initiative (2000-2011))

FINDING #2: CIVIL PENALTIES WERE THE SMALLEST COMPONENT OF THE SETTLEMENTS

The lowest civil penalty imposed on settling utilities for permitting violations was \$100,000 while the largest was \$15 million.⁸⁵ The mean civil

84. We employed the most conservative assumptions in computing the cost of mitigation projects and injunctive relief. For example, in a case where the violator's cost of complying with the injunction had a range of three billion dollars to five billion dollars, we chose the lower number. If no dollar figure was reported for either the mitigation or injunctive relief, we coded the amount as zero.

85. These numbers may understate the true cost because a violator has tax incentives to minimize the amount allocated to civil penalties. Civil penalties are not tax deductible, whereas expenditures for civil mitigation projects and compliance with injunctions may be written off as business expenses. The principal federal tax code provision authorizing the deductibility of settlement payments to government agencies is 26 U.S.C. § 162 (2006). Section 162(a) allows a deduction of "all the ordinary and necessary expenses paid or incurred during the taxable year in carrying on any trade or business." I.R.C. § 162(a) (2006). *See generally* 2000 I.R.S. N.S.A.R. 10768, 2000 WL 34416689 (June 1, 2000) ("Payments to settle a claim against a corporation in a lawsuit have been held to be ordinary and necessary business expenses as long as the payments were a reasonable way of

penalty payment was \$3.6 million, with a median payment of \$1.9 million. The sum of all civil penalties assessed was \$79 million, a relatively small amount when compared with the money expended by these electricity producers for mitigation projects, which totaled \$615.8 million. Settling coal-fired plant permitting disputes cost utilities an average of twenty-eight million dollars for mitigation projects alone. The median cost for mitigation projects ordered was \$6.1 million. The total sum for the cost of utilities complying with injunctions was \$16.1 billion.

The EPA imposes civil penalties if a plant began construction or embarked on a major modification without obtaining a valid permit.⁸⁶ A court's penalty assessment ideally captures the full social cost of a utility's conscious disregard of its duty to apply for a MACT determination. Section 120 of the CAA provides for augmented remedies for "delayed compliance orders, designed to deprive the polluter of any financial savings realized as a result of delayed compliance with the law."⁸⁷ When starting with the maximum penalty, courts will typically consider the factors described in 42 U.S.C. § 7413 to determine whether there is any reason to mitigate the punishment.⁸⁸ Failure to seek permitting to implement MACT is likely to be the result of an impermissible cost/benefit analysis that trades public health for short-term profits. In cases where a utility has purely economic reasons for noncompliance with EPA permitting, the willful violation will be considered an aggravating factor.⁸⁹

Section 113(b) of the CAA allowed plaintiffs to seek up to \$32,500 per day for violations between March 15, 2004, and January 12, 2009.⁹⁰ After January 12, 2009, the maximum penalty was increased to \$37,500 per

protecting the corporation or mitigating potential damages." This provision, however, contains an important limitation. Under section 162(f), a deduction is disallowed for a "fine or similar penalty paid to a government for the violation of any law." I.R.C. § 162(f).

86. EPA, PERMIT PENALTY POLICY FOR VIOLATIONS OF REQUIREMENTS APPLICABLE TO NEW AND MODIFIED SOURCES UNDER THE CLEAN AIR ACT, at 2-3 (Feb. 3, 1981), available at www.envinfo.com/caain/enforcement/caad8.html.

87. FRANK P. GRAD, TREATISE ON ENVIRONMENTAL LAW ch. 2, § 3 (Matthew Bender 2012) (citing 42 U.S.C. § 7420 (2006)).

88. *Pound v. Airosol Co.*, 498 F.3d 1089, 1095 (10th Cir. 2007) (stating principle that a court begins with the maximum penalty and then examines 42 U.S.C. § 7413 in order to determine whether there is a basis for mitigation).

89. See *Clean Air Act Stationary Source Civil Penalty Policy*, EPA, 16 (Oct. 25, 1991), <http://www.epa.gov/compliance/resources/policies/civil/caa/stationary/penpol.pdf> [hereinafter *Civil Penalty Policy*] (treating degree of willfulness or negligence as an aggravating factor in assessing penalties).

90. 40 C.F.R. § 19.4 (2012).

day.⁹¹ In determining penalties, a utility is liable for each day of its continuing violation from the time it began construction or modification without a permit until it secures its MACT approval (if ever).⁹² This duration factor likely accounts for some of the variation in the size of civil penalties, as do the electricity generator's overall wealth and size of operations.

FINDING #3: MITIGATION PROJECTS COST THE SETTLING DEFENDANTS AN AVERAGE OF \$28 MILLION, ALMOST EIGHT TIMES MORE THAN WHAT THEY PAID FOR CIVIL PENALTIES

In the Clean Air Act settlements we studied, mitigation costs far outweighed the monetary value of civil penalties imposed. Typically, these mitigation projects require the settling utility to develop a schedule for implementing the projects.⁹³ Mitigation projects were more than 7.8 times more costly than civil penalties in coal-fired plant permitting cases.

Table 1 reveals that the median cost for the ordered civil mitigation projects was \$6.1 million for the twenty-two settlements but, as shown in Table 2 (below), the costs of these remedial projects varied widely. Almost three-quarters of the coal-fired plant settlements mandated more than four million dollars for civil mitigation projects, with half of the defendants

91. *Id.* (showing penalty adjustments and including table showing penalties effective March 15, 2004, through January 12, 2009, as \$32,500 per day and penalties after January 12, 2009, as \$37,500 per day).

92. In *United States v. ITT Continental Baking Co.*, the Court explained the importance of considering duration of an offense when imposing civil penalties:

It seems apparent that acquisition in violation of an FTC order banning "acquiring" certain assets could be such a violation. Any anticompetitive effect of an acquisition continues as long as the assets obtained are retained, and the violator could undo or minimize any such effect by disposing of the assets at any time after the initial transaction. On the other hand, if violation of an order prohibiting "acquiring" assets were treated as a single violation, any deterrent effect of the penalty provisions would be entirely undermined, and the penalty would be converted into a minor tax upon a violation which could reap large financial benefits to the perpetrator. As we have seen, Congress added the continuing-penalty provisions precisely to avoid such a result.

420 U.S. 223, 232-33 (1975) (discussing the "continuing failure or neglect to obey" provision of section 45(l) of the Federal Trade Commission Act and the like provision included in the Clayton Act in 1959).

93. *Dairyland Power Cooperative Settlement*, EPA (June 29, 2012), <http://www.epa.gov/compliance/resources/cases/civil/caa/dairylandpower.html> (describing how mitigation projects work in Clean Air Act settlements).

paying more than six million dollars for civil mitigation to settle their cases. The lowest amount spent for mitigation projects was \$400,000 while the largest sum for mitigation projects was \$350 million. The modal settlement amount for civil mitigation projects was \$2.5 million.

Table 2: Civil Mitigation Costs in Quartiles

Violator's Cost of Ordered Civil Mitigation Projects		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below \$4,000,001	6	27.3	27.3	27.3
	\$4,000,001 to \$6,000,000	5	22.7	22.7	50.0
	\$6,000,001 to \$15,000,000	6	27.3	27.3	77.3
	Above \$15,000,000	5	22.7	22.7	100.0
	Total	22	100.0	100.0	

Many settling utilities agreed to undertake multi-million dollar expenditures to retrofit or repower extant generating units as a condition of settling their cases. In some EPA permitting cases, utilities voluntarily retired their electrical generating units (EGUs) rather than pay the cost of compliance such as installing state-of-the art pollution controls.⁹⁴ Older coal-fired plants were the most likely to retire their power generating units instead of undertaking expensive retrofitting projects. The energy industry blames the EPA coal-fired plant initiative, combined with falling energy prices, for the loss of jobs and potential energy shortfalls.⁹⁵ Defenders of

94. See, e.g., *Northern Indiana Public Service Company Clean Air Act Settlement*, *supra* note 28 (agreeing to voluntarily retire the Dean H. Mitchell station as part of the settlement as opposed to retrofitting it to comply with Clean Air Act permitting requirements); *Duke Energy Gallagher Plant Settlement*, EPA (Dec. 22, 2009), <http://www.epa.gov/compliance/resources/cases/civil/caa/dukeenergy.html> (giving Duke Electric an option to “elect to either permanently shutdown [sic] or repower the units to burn natural gas instead of coal”).

95. Kevin Begos, *5 Pa. Coal-Fired Power Plants to Close*, YAHOO! (Mar. 1, 2012, 10:59 AM), <http://finance.yahoo.com/news/5-pa-coal-fired-power-231156108.html> (“Tougher air quality rules from the Environmental Protection Agency are forcing some companies to choose between costly upgrades, closing older plants or building new power plants that can also run on cleaner-burning natural gas.”); see also Joseph Baker, *Out with the Old: More Coal-Fired*

the EPA counter that the retired plants are old, inefficient, and economically marginal.⁹⁶ Retrofitting or retiring generating units improved the quality of the air all Americans breathe.

FINDING #4: THE COST OF COMPLYING WITH INJUNCTIONS WAS TWENTY-SIX TIMES THE COST OF MITIGATION PROJECTS AND 200 TIMES THE DOLLAR VALUE ATTRIBUTED TO CIVIL PENALTIES

The largest component of a coal-fired power plant settlement, by far, was the estimated cost of complying with the EPA ordered injunction. As Table 1 shows, compliance costs were more than twenty-six times the utilities' expenditures for mitigation projects and more than 200 times more costly than civil penalties. Table 3 below reports the costs of installation of appropriate pollution controls, further remedial measures, and other monies paid by the violators in compliance with consent decrees.

As Table 3 reveals, the price of wrongdoing was significant in coal-fired plant permitting violation actions. The average cost for a violator to comply with injunctive relief in the twenty-two cases was \$730.7 million. The median cost of compliance for settling utilities was \$368.5 million. For example, in its 2007 settlement with the EPA, Nevada Power agreed to install pollution controls at an estimated cost of sixty million dollars, which will reduce nitrogen oxide (NO_x) emissions "by about 2,300 tons per year from 2004-2005 levels, an 86% reduction."⁹⁷ The EPA's "\$1.2 billion settlement with the Virginia Electric Power Co. (VEPCO) will eliminate

Generation Closures Announced, ENERGY BOOM (Mar. 1, 2012), <http://www.energyboom.com/emerging/out-old-more-coal-fired-generation-closures-announced> ("Shutting down old and seemingly dirty, out of date coal generation is a growing trend among big utilities in the United States. Most claim that President Obama and his Administration are hurting Americans by imposing new emission standards and closing these generation facilities, as these closures will leave serious gaps in needed electricity.").

96. Jim DiPeso, *Old Coal Plants Shift Blame as Well as Costs*, DAILY GREEN (Feb. 29, 2012, 6:07 PM), <http://www.thedailygreen.com/environmental-news/blogs/republican/coal-woes-linked-to-market> ("The sharp decline in natural gas prices, the rising cost of coal, and reduced demand for electricity are all contributing factors in the decisions to retire some of the country's oldest coal-fired generating units. These trends started well before EPA issued its new air pollution rules." (quoting a report by energy analyst Susan Tierney) (internal quotation marks omitted)).

97. *U.S. Announces \$60.7 Million Clean Air Act Settlement with Nevada Power*, EPA (June 13, 2007), <http://yosemite.epa.gov/opa/admpress.nsf/e87e8bc7fd0c11f1852572a000650c05/507b7edf4c7f52a5852572f90065d491!OpenDocument>.

237,000 tons of air pollution each year from eight coal-fired power plants in Virginia and West Virginia.”⁹⁸

Table 3: Utilities' Cost of Compliance with Permitting Injunction

	Frequency	Percent	Valid Percent	Cumulative Percent
< \$30 million	2	9.1	9.1	9.1
\$30 million	1	4.5	4.5	13.6
\$60 million	1	4.5	4.5	18.2
\$85 million	1	4.5	4.5	22.7
\$100 million	1	4.5	4.5	27.3
\$135 million	1	4.5	4.5	31.8
\$200 million	1	4.5	4.5	36.4
\$275 million	1	4.5	4.5	40.9
\$330 million	1	4.5	4.5	45.5
\$337 million	1	4.5	4.5	50.0
\$400 million	2	9.1	9.1	59.1
\$500 million	1	4.5	4.5	63.6
\$520 million	1	4.5	4.5	68.2
\$600 million	2	9.1	9.1	77.3
\$603 million	1	4.5	4.5	81.8
\$1.1 billion	1	4.5	4.5	86.4
\$1.2 billion	1	4.5	4.5	90.9
\$4 billion	1	4.5	4.5	95.5
\$4.6 billion	1	4.5	4.5	100.0
Total	22	100.0	100.0	

The EPA not only punishes and deters utilities for past violations; it also requires utilities to retrofit, retire, or undertake other costly measures to improve air quality. Northern Indiana Public Service Company's (NIPSCO) Clean Air Act settlement included \$9.5 million in environmental projects to atone for “the impacts of past emissions.”⁹⁹ NIPSCO's ordered

98. *Fact Sheet: 2003 Environmental Enforcement Accomplishments*, U.S. DEP'T OF JUSTICE (July 21, 2003), http://www.justice.gov/opa/pr/2003/July/03_enrd_431.htm.

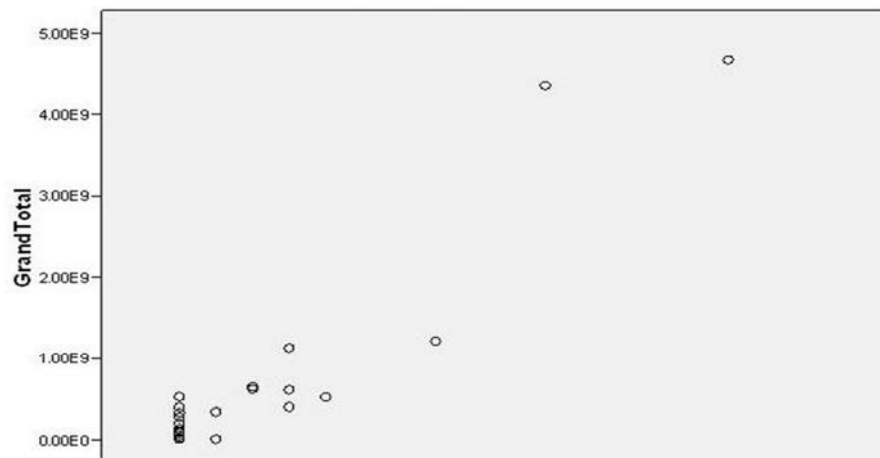
99. *Northern Indiana Public Service Company Clean Air Act Settlement*, *supra* note 28.

environmental mitigation projects include “Clean Diesel Retrofit, Woodstove/Outdoor Boiler Changeout, and Land Acquisition and Restoration projects. The remaining money [could] be spent on the Hybrid/Electric Fleet, Electric Infrastructure, and Electric to Natural Gas Conversion projects.”¹⁰⁰ Each NIPSCO remedial project pays back its direct victims who reside near the utility’s facilities. Moreover, NIPSCO agreed to a clean diesel retrofit project through which it will upgrade public diesel engines to minimize “emissions of NO_x and volatile organic compounds (VOCs).”¹⁰¹ NIPSCO’s other reparative projects include woodstove and outdoor boiler upgrades, restoration of the Indiana Dunes National Lakeshore, and the submission of plans for a hybrid fleet.¹⁰²

FINDING #5: THE TOTAL COST TO SETTLE IS HIGHLY CORRELATED WITH THE NUMBER OF PLANTS COVERED

Table 4: Scattergram and Symmetrical Measures of the Relationship Between a Coal-Fired Plant Violator’s Number of Plants Covered by Decree and the Size of Civil Penalties with Total Sample, (N=22)¹⁰³

Total Expenditures by Number of Facilities



100. *Id.*

101. *Id.*

102. *Id.*

103. A line of best fit is a proxy for a trend line that represents the data on a scatter plot. Outliers are data points located far away from the best fit line. “When performing least squares fitting [a method of determining the line of best fit] to data, it is often best to discard outliers before computing the line of best fit.” Eric Weisstein, *Outlier*, WOLFRAM RESEARCH, <http://mathworld.wolfram.com/Outlier.html> (last visited Mar. 24, 2013) (emphasis added).

		Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Interval by Interval	Pearson's r	.935	.036	11.797	.000
Ordinal by Ordinal	Spearman Correlation	.775	.104	5.485	.000
N of Valid Cases ¹⁰⁴		22			

Table 4 shows that civil penalties vary with the utility's number of noncompliant plants addressed in the settlement agreement. This is logical. The number of plants covered by a consent decree is a proxy for the assets of the violator as well as the amount of pollutants emitted by the utility. The scatter plot in Table 4 depicts a near linear relationship between the number of plants covered by permitting violations and the size of the costs expended to settle the case. The Pearson's r^{105} of 0.935 indicates a very strong positive correlation between the size of the penalties assessed and the number of plants covered by the decree.¹⁰⁶ A Spearman correlation was also computed to adjust for the skewness of the data and the small sample size.¹⁰⁷ A correlation of 0.775 again demonstrates a strong positive

104. This calculation does not assume the null hypothesis and employs the asymptotic standard error assuming the null hypothesis based on normal approximation.

105. The Pearson's r correlation tests the magnitude and direction of the association between the size of EPA civil penalties imposed and the number of plants included in the settlements and consent decrees of section 112 permit violators. This measure is appropriate where two variables are on an interval or a ratio scale, such as dollar size of EPA civil penalties and the violator's number of coal-fired plants covered by the decree. The Pearson's r correlation coefficient is a number between +1 and -1. This number is useful in determining the magnitude and direction of the association between two variables.

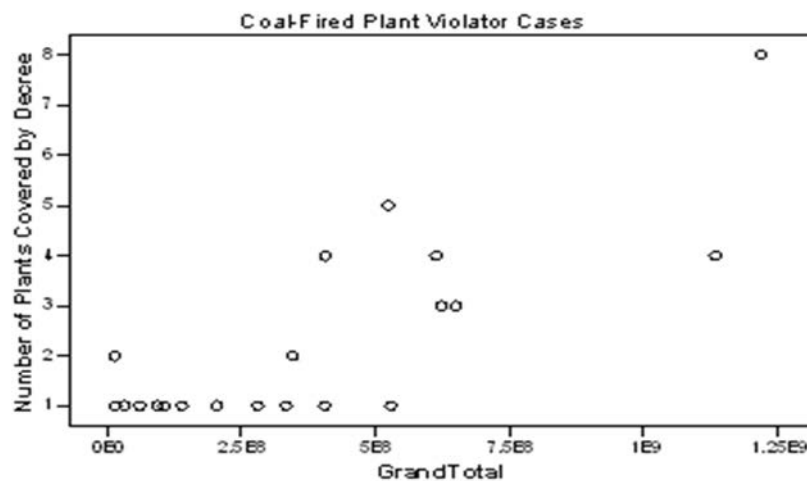
106. The Pearson's r correlation measures the strength of the correlation between number of plants and the grand total of dollars paid by past permit violators. The closer the correlation is to +1 or -1, the stronger the correlation is. Thus an r of 0.935 is statistically significant at below the 0.001 level. The probability level of 0.001 means that there is only a 1 in a 1000 chance that this relation is a chance occurrence. The number of plants is a proxy for size of the violator's operations, which is a critically important factor in achieving optimal deterrence.

107. The Spearman Rank Order Correlation coefficient, r_s , is a non-parametric measure of the strength and direction of association that exists between two variables measured on at least an ordinal scale. It is denoted by the symbol r_s (or the Greek letter $[\rho]$, pronounced rho). The test is used for either ordinal variables or for interval data that has failed the assumptions necessary for conducting the Pearson's product-moment correlation.

statistical relationship¹⁰⁸ between the total amount that a violator paid to settle its case and the number of plants.¹⁰⁹

Table 5 below depicts the Pearson's r and Spearman correlation representing the association between the violator's number of plants covered by the settlement agreement and total expenditures to comply with the injunction with the two largest settlements omitted. This table consists of only twenty of the twenty-two cases because the two very large outliers were removed from the analysis as these outsized settlements might unreasonably skew the result upward. These statistical outliers are the \$4.675 billion total costs in the 2007 American Electrical Power settlement and the \$4.36 billion grand total in the Tennessee Valley Authority settlement of 2011.¹¹⁰

Table 5: The Relationship Between Number of Plants and Total Costs Expended with Two Largest Outliers Excluded (N=20)



108. Online Statistics, Introduction to Bivariate Data, <http://onlinestatbook.com/chapter4/pearson.html> (describing a strong positive relationship indicated by a high positive Pearson's r correlation).

109. As with the Pearson's r , the Spearman correlation indicates a positive direction and a strong association between number of plants and costs expended. In general, the greater the number of plants covered by a settlement or consent decree, the greater the defendant's overall expenditure. However, the scatter plot reveals two outliers in the top right corner, which are the multi-billion dollar costs in the Tennessee Valley Authority and American Electrical Power cases. The scatter plot in Table 5 excludes the two large multi-billion dollar awards.

110. To get a better picture of the association between plant size and costs imposed on violators, the Pearson's r was recalculated without these two multi-billion dollar settlements as illustrated in Table 5. Even without these two outliers, the relationship between number of plants and the settlement costs remains extremely strong.

		Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Interval by Interval	Pearson's r	.803	.082	5.714	.000
Ordinal by Ordinal	Spearman Correlation	.694	.127	4.090	.001
N of Valid Cases		20			

Even with the two outliers removed, the 0.803 Pearson's r score reveals that the greater the number of plants, the larger the total cost to the defendant in settling the permitting violation.¹¹¹ As with Table 4, the Spearman Rank Order Correlation was computed. Table 5 reveals that the Spearman correlation is statistically significant at the 0.001 level and the relationship is positive at 0.694.¹¹² The total cost varies depending upon the defendant utility's number of coal-fired plants in violation covered by the settlement agreement.

**FINDING #6: THE MEAN CIVIL PENALTY, MITIGATION
PROJECTS, AND COST OF COMPLIANCE ARE ALL LOWER FOR
SINGLE PLANTS VERSUS VIOLATORS WHOSE DECREES
COVERED MULTIPLE PLANTS**

Table 6 below represents the eleven coal-fired permitting cases in which the settlement applied to permitting violations at a single electricity plant as opposed to multiple facilities. Single plants paid smaller penalties than utilities with several different noncompliant facilities. In the Tennessee Valley Authority (TVA) case, for example, the civil penalty was ten million dollars to settle all claims against the defendant for permitting offenses at eleven different TVA plants located in Alabama, Kentucky, and Tennessee.¹¹³ In contrast, the Southern Indiana Gas and Electric Company

111. The positive correlation indicates that as the number of plants increases, the size of the grand total r also increases. A negative correlation would have indicated that the two variables had a negative relationship (as one increased, the other decreased).

112. The Spearman correlation demonstrates a statistically significant relationship between the size of the violator and size of expenditures to settle its permitting violation case at the 0.001 level. Like the Pearson's r score, the Spearman correlation measures the direction and size of the association between the number of a violator's plants and what the coal plant owner paid to settle the case (penalty plus mitigation plus cost of compliance with the injunction).

113. *Tennessee Valley Authority Clean Air Act Settlement*, *supra* note 11; *see also* Letter from John H. Hankinson, Jr., Reg'l Adm'r, EPA to Joseph Bynam [sic], Exec. Vice

paid a \$600,000 fine for permitting violations at a single plant.¹¹⁴ This finding demonstrates that the EPA considers the number of generating units in calibrating punishment.

Table 6: Central Tendency Measures for Single Plant Violators, 2000-2011, (N=11)

	Civil Penalty Imposed in Decree	Mitigation Projects Cost	Estimated Cost of Compliance with Injunction	Grand Total of All Costs to Settle Cases
N Valid	11	11	11	11
Missing	0	0	0	0
Mean	\$1,113,636	\$5,195,455	\$194,090,910	\$200,163,636
Median	\$950,000	\$5,000,000	\$135,000,000	\$139,400,000
Mode ¹¹⁵	\$850,000	\$2500,000	\$0	\$1,5850,000
Sum	\$12,250,000	\$57,150,000	\$2,135,000,000	\$2,201,800,000

As Table 6 reveals, the mean civil penalty for single plant violators (N=11) was \$1.1 million, which is less than one-third of the average penalty for all twenty-two violators as shown in Table 1. The mean cost of mitigation projects, \$28 million, was 5.39 times larger for the full sample than the \$5.2 million expended by single plant violators. The mean cost of compliance in single plant settlements was \$194.1 million, which was only 27% of the comparable costs of the average violator in the complete sample (\$730.7 million). The total average cost to settle single plant cases was \$200.2 million. Even single plant violators paid a heavy price for not seeking a permit before commencing major modifications in their plants but multiple plant settlements were considerably more costly.

Courts weigh the magnitude of the construction project and the plant owner's assets in determining the size of the penalty necessary to achieve

President, Tenn. Valley Auth. Fossil Power Group (n.d.), available at <http://www.epa.gov/compliance/resources/cases/civil/caa/tvamemo.pdf> (last visited Mar. 24, 2013).

114. *Southern Indiana Gas and Electric Company (SIGECO) F.B. Culley Plant Clean Air Act Settlement*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/sigecofb.html> (last visited Mar. 24, 2013).

115. There is more than one modal value in Table 6. Following the standard statistical practice, only the smallest value is depicted.

deterrence. The EPA penalty must dissuade an offender from engaging in an impermissible cost-benefit analysis by balancing the cost of complying with the MACT permitting process against corporate profits. Notably, section 7413 of the CAA does not provide courts with guidance for determining the assessment of penalties, giving judges considerable discretion in calibrating civil penalties.¹¹⁶ Our statistical findings demonstrate that courts consider the financial circumstances of a utility in setting the per-day penalty to achieve deterrence.¹¹⁷ Courts may take judicial notice of the violator's ability to pay based upon a utility's forward contracts anticipating a new or modified facility. Alternatively, a court may determine wealth by considering other financial metrics including low variable costs, forward energy contracts, or other measures of strong forward cash flows.

FINDING #7: THE LARGER THE UTILITY, THE BETTER ITS
ABILITY TO PAY AND THE GREATER THE HARM CAUSED BY
THE FAILURE TO EMPLOY THE BEST AVAILABLE ANTI-
POLLUTION TECHNOLOGY

Our empirical evidence reveals that civil penalties generally increase with the amount of environmental damage. The number of plants—a good proxy for the size of the violator's operations and ultimately the amount of emitted air toxics—is a highly significant predictor for the size of penalties, mitigation costs, and injunctive costs. Congress requires courts to consider the size of the business because of the obvious relationship of this factor to deterrence goals.¹¹⁸ These factors point to a strong positive correlation

116. See 42 U.S.C. § 7413 (2006).

117. RESTATEMENT (SECOND) OF TORTS § 908(2) (1979) (“Punitive damages may be awarded for conduct that is outrageous, because of the defendant’s evil motive or his reckless indifference to the rights of others. In assessing punitive damages, the trier of fact can properly consider the character of the defendant’s act, the nature and extent of the harm to the plaintiff that the defendant caused or intended to cause and the wealth of the defendant.”).

118. The EPA has adopted numerous guidance documents explaining its interpretation of the CAA’s section 113 penalty assessment criteria and how it intends to apply the criteria. EPA’s Clean Air Act Stationary Source Civil Penalty Policy was issued in 1984 and last revised in 1991. See *Civil Penalty Policy*, *supra* note 89, at 1. The Penalty Policy states that it “reflects the factors enumerated in Section 113(e) that the court (in Section 113(b) actions) and the Administrator (in Section 113(d) actions) shall take into consideration in the assessment of any penalty.” *Id.* The Penalty Policy highlights the importance of recovering the economic benefit of the violation and of considering the gravity of the violation. *Id.* at 4-

between the amount of electricity produced and the size of the EPA's penalty.

Table 7: Past Permitting Violation Cases Where the Facilities in Question Had Less than 850 Megawatt Capacity

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Civil Penalty Imposed in Decree	4	\$100,000	\$1,750,000	\$3,550,000	\$887,500	\$675,000
Mitigation Projects Cost	4	\$4,900,000	\$15,000,000	\$31,150,000	\$7,787,500	\$4,847,400.506
Estimated Cost of Compliance with Injunction	4	\$0	\$200 million	\$385,000,000	\$96.25 million	\$81,993,394,043
Grand Total	4	\$15,850,000	\$205 million	\$419.7 million	\$104.925 million	\$77,658,273.867
Valid N (listwise)	4					

Tables 7 and 8 demonstrate that there is, in fact, a strong relationship between the amounts of electricity produced, the excess pollution emitted, and the civil penalty assessed. For the four smallest coal plants (less than 850 megawatts), the average megawattage was 537 (the median was 618). Table 7 shows that, for these low megawattage plants, the mean civil penalty was \$887,500 and the median civil penalty was \$850,000. The mean cost of mitigation projects for these small coal-fired plants was \$7.8 million. The estimated cost of complying with the injunctive relief for this sample was \$96.3 million.¹¹⁹

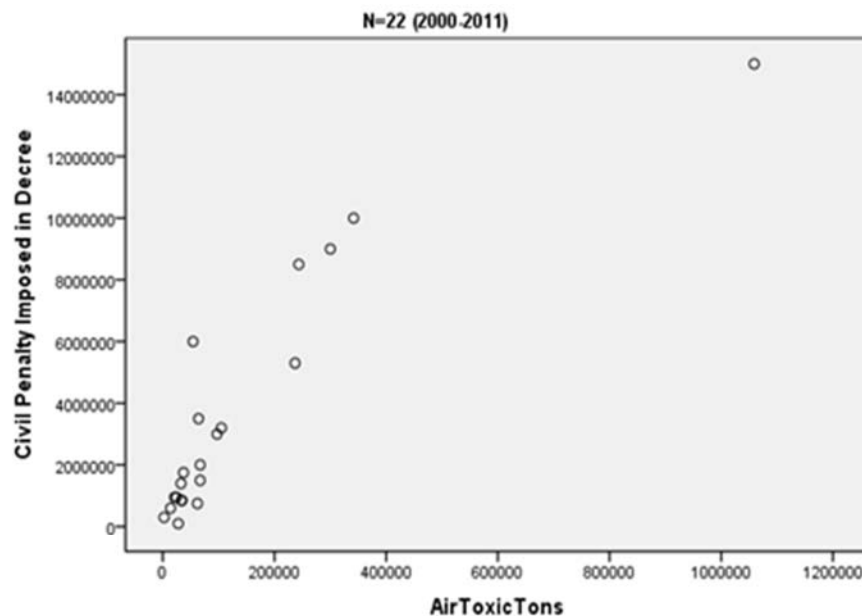
8. It refers to these considerations as the "preliminary deterrence amount." *Id.* at 4. The policy includes an appendix that specifies a method for calculating economic benefit, which includes consideration of delayed and avoided cost. *Id.* at 4-6. It also specifies factors to be considered in determining the gravity of the violation, which the policy states are "designed to reflect [the factors] listed in Section 113(e) of the Act." *Id.* at 9. The listed factors include: "actual or possible harm," "the amount of pollutant[s]" emitted, "sensitivity of the environment," "toxicity of the pollutant[s]," length of the violation, and "size of [the] violator." *Id.* at 9-10.

119. One cautionary note is that complete data on the megawattage was only reported for twelve of the twenty-two cases in the study.

**FINDING #8: THERE IS A LINEAR RELATIONSHIP BETWEEN
THE SIZE OF CIVIL PENALTIES AND TONS OF AIR TOXINS
REDUCED BY THE SETTLEMENTS**

As the scattergram in Table 8 illustrates, the EPA and the United States Department of Justice imposed civil penalties that are roughly proportional to the amount of excessive preventable air toxins created by the permitting violation.¹²⁰ The enforcement actions resulted in an average of 120,725 fewer tons of atmospheric toxics. This linear relationship suggests that the EPA penalty policy is not applied arbitrarily, but rather reflects true societal harm.

Table 8: Tons of Pollutants Is Proportional to the Size of Civil Penalties



Courts apply common sense in raising the price of wrongdoing to make the wealthiest and most serious polluters think twice before they construct

120. One note of caution is that the case settlements did not report reduced particulate toxics, mercury, or other noxious air pollutants. A more complete study would examine whether this statistical relationship held for other toxics reduced. Such an analysis is beyond the scope of this article.

or modify their plants without the proper permits. The lowest quartile for settling a coal-fired permitting case ranged from fourteen million dollars to \$105.9 million.¹²¹ The monotonic relationship between air toxic reduction and expenditures confirms that the reduced tonnage of air pollutants is an important predictor of the penalties paid by utilities.

For the EPA Coal-Fired Plant Initiative as a whole, the enforcement actions have resulted in an average of 134,344 fewer tons of toxics in the air Americans breathe.¹²² The median reduction in SO₂ and NO_x per year reduced by each EPA settlement or consent decree entered into by coal-fired plants is 57,000 tons of air toxins.¹²³ Deterrence in federal environmental law requires that large polluters pay a high cost for wrongdoing and our empirical data confirms that the EPA's initiative is based upon deterrence-based punishment.

In the largest of the twenty-two coal-fired plant settlements, American Electric Power (AEP) agreed to comply with an injunction requiring the company to reduce its emissions by 813,000 tons of pollutants per year (tpy) "at an estimated cost of more than \$4.6 billion."¹²⁴ This record settlement obligated AEP to implement technology that would lower the level of nitrogen oxides for each calendar year from 2009 to 2016.¹²⁵ AEP's settlement also required it to reduce annual tonnage of air toxic emissions from 450,000 tpy to 174,000 tpy from 2010 to 2019, with additional reductions each year afterwards.¹²⁶ To achieve these reductions, AEP

121. A larger sample is needed to determine whether the cost of wrongdoing is correlated with the amount of electricity produced.

122. We computed the number of tons of toxics by developing a frequency distribution based on data reported in the Clean Air Act Settlements. *See Coal-Fired Power Plant Enforcement Initiative, supra* note 10 (all data from January 1, 2003, through April 14, 2011, was included in our analysis).

123. These tonnage estimates are drawn from the EPA reports of settlements and consent decrees.

124. *American Electric Power Service Corporation Information Sheet*, EPA (Oct. 9, 2007), <http://www.epa.gov/compliance/resources/cases/civil/caa/americanelectricpower1007.html>.

125. *Id.* ("In 2006, nitrogen oxide (NO_x) emissions at these 16 plants totaled 231,000 tons per year. By 2016, these AEP emissions will be reduced to 72,000 tons per year, continuing in perpetuity. In 2006, sulfur dioxide (SO₂) emissions at these 16 plants totaled 828,000 tons per year. By 2018, these AEP emissions will be reduced to 174,000 tons per year, continuing in perpetuity. This SO₂ reduction—from a single settlement—is more than the SO₂ emitted from most states (45 out of 50). This reduction in emissions is one of the largest percentage decreases achieved in any of the United States' prior settlements with coal-fired electric utilities, and it reflects a multibillion dollar investment by AEP.")

126. *Id.*

agreed to install and continuously operate pollution controls in each electrical generating unit in its system.¹²⁷

The EPA also ordered AEP to disburse sixty million dollars to fund projects to mitigate the adverse effects of its past emissions, which dwarfed AMP's costs of mitigation.¹²⁸ These restorative expenditures were subdivided into a federal share for mitigation projects (sixty percent) and a state share (forty percent).¹²⁹ AEP's projects included both the purchase and restoration of sensitive lands in several Eastern states and improvements in emissions reduction and nitrogen loading to Chesapeake Bay.¹³⁰

AEP made physical and operational changes at nine of its plants that constituted "major modifications" without first undergoing PSD review or Non-attainment New Source Review (NNSR), obtaining required permits, and installing and operating Best Available Control Technology and/or technology reflecting the Lowest Achievable Emission Rate (LAER) to reduce air pollution.¹³¹

The findings from this study provide a valuable baseline for calibrating just penalties in future EPA permitting cases. Congress recognizes that larger CAA penalties are necessary to deter larger utilities.¹³² The EPA's Uniform Civil Penalty Policy requires size to be considered as a proxy for the defendant's "ability to pay," as a factor in calibrating civil penalties.¹³³ Our empirical examination reveals that, in fact, courts do approve decrees where the civil penalties generally increase relative to the size of the business. The number of plants, a good proxy for business size, is also a

127. *Id.*

128. *Id.*

129. *Id.*

130. The idea was that AEP would "restore or improve watersheds and forests in national parks adversely affected by past emissions; reduce nitrogen loading to Chesapeake Bay through actions such as the acquisition of buffer zones" and take additional actions in twenty-four states. *Id.*

131. *Id.*

132. See *Civil Penalty Policy*, *supra* note 89, at 9.

133. See, e.g., Memorandum from Thomas L. Adams Jr., Assistant Adm'r for Enforcement & Compliance Monitoring, EPA to Assistant & Reg'l Adm'rs (Dec. 16, 1986), available at <http://www.epa.gov/enforcement/documents/policies/civilpenalty-violators.pdf> (noting that the policy applies to the calculation of civil penalties that the EPA imposes on for-profit publicly held or closely held entities and for-profit entities owned by not-for-profit entities).

highly significant predictor of civil penalty size, mitigation expenses, and injunctive costs.

III. The Integration of Deterrence and Restorative Justice-Based Enforcement into EPA Final Settlements

The data presented in Part II demonstrate that penalties are calibrated to the size, harm, and number of plants under the settlement decree, which is consistent with deterrence-based civil enforcement.¹³⁴ The EPA policy on civil penalties, dating from February 16, 1984, establishes deterrence as the EPA's primary goal in imposing civil punishment.¹³⁵ In the standard law and economics model of deterrence, companies are profit maximizers that rationally choose their "environmental performance by balancing the expected costs of polluting with the expected benefits of doing so."¹³⁶ Courts must set penalties at a level high enough to discourage a utility from

134. See CLIFFORD RECHTSCHAFFEN & DAVID L. MARKELL, REINVENTING ENVIRONMENTAL ENFORCEMENT AND THE STATE/FEDERAL RELATIONSHIP 102 (2003); Markell, *supra* note 43, at 3; Marc Melnick & Elizabeth Willes, Comment, *Watching the Candy Store: EPA Overfiling of Local Air Pollution Variances*, 20 *ECOLOGY L.Q.* 207, 252 (1993).

135. EPA, POLICY ON CIVIL PENALTIES: EPA GENERAL ENFORCEMENT POLICY GM-21, at 3 (1984), available at http://www.epa.gov/enforcement/documents/policies/epapolicy-civil_penalties021684.pdf. The methodology for assessing a civil penalty under the Clean Air Act is based upon section 113 of the CAA, 42 U.S.C. § 7413, and contains specific factors which the court may take into consideration:

[(1)] the size of the business, [(2)] the economic impact of the penalty on the business, [(3)] the violator's full compliance history and good faith efforts to comply, [(4)] the duration of the violation as established by any credible evidence . . . [(5)] payment by the violator of penalties previously assessed for the same violation, [(6)] the economic benefit of noncompliance, and [(7)] the seriousness of the violation.

42 U.S.C. § 7413(e)(1) (2006). The court may assess a penalty "for each day of violation." *Id.* § 7413(e)(2). Civil penalties will not be an effective deterrent if they are regarded as nothing more than the cost of doing business. See *United States v. ITT Cont'l Baking Co.*, 420 U.S. 223, 231 (1975); see also *Kemezy v. Peters*, 79 F.3d 33, 34 (7th Cir. 1996) ("[There is a] close relation between the compensatory and deterrent objectives of tort law, or, more precisely perhaps, its rectificatory and regulatory purposes. Knowing that he will have to pay compensation for harm inflicted, the potential injurer will be deterred from inflicting that harm unless the benefits to him are greater. If we do not want him to balance costs and benefits in this fashion, we can add a dollop of punitive damages to make the costs greater.").

136. JAY P. SHIMSHACK, EPA, MONITORING, ENFORCEMENT, & ENVIRONMENTAL COMPLIANCE: UNDERSTANDING SPECIFIC & GENERAL DETERRENCE 6 (Oct. 2007), available at <http://www.epa.gov/oecaerth/resources/reports/compliance/research/meec-whitepaper.pdf>.

repeating its wrongdoing. The penalty should sting, but not be so severe as to destroy the corporation's ability to continue to serve the public by producing electrical power.

A. The EPA's General and Specific Deterrence Objectives

"Specific deterrence assesses a price to a particular wrongful act, whereas general deterrence fulfills the larger function of vindicating the broader societal interest by making wrongful acts more expensive and less attractive to potential wrongdoers."¹³⁷ When approving a CAA settlement, a court must consider general deterrence because its decision will send a message to an industry that has a history of externalizing its pollution costs by bypassing the CAA permitting process and risking the public's health for profits.¹³⁸ Both specific and general deterrence are predicated on the assumption that defendants engage in misconduct only after rationally weighing benefits and potential costs.¹³⁹

137. Michael L. Rustad, *Happy No More: Federalism Derailed By the Court That Would be King of Punitive Damages*, 64 MD. L. REV. 461, 523-24 (2005); see also Michael Rustad & Thomas Koenig, *The Historical Continuity of Punitive Damages Awards: Reforming the Tort Reformers*, 42 AM. U. L. REV. 1269, 1318-28 (1993) (describing general deterrence as sending a cautionary message to other potential wrongdoers).

138. See *Coal-Fired Power Plant Enforcement Initiative*, *supra* note 10 ("On November 3, 1999, the Department of Justice and the Environmental Protection Agency announced the filing of civil complaints against seven electric utility companies operating coal-fired power plants in the Midwest and Southeast, charging that their plants illegally released massive amounts of air pollutants over a period of several years and contributed [to] some of the most severe environmental problems facing the United States today. The companies involved are American Electric Power Company, Cinergy, FirstEnergy, Illinois Power, Southern Indiana Gas & Electric Company, Southern Company and Tampa Electric Company. In separate but related actions, EPA issued Notices of Violations to these same companies, plus an administrative order against the Tennessee Valley Authority. Perhaps the most comprehensive, coordinated enforcement effort under the Clean Air Act to date, the complaints, Notices of Violation and administrative order cover 32 plants located in 10 states."); see also Press Release, U.S. Dep't of Justice, *supra* note 30 ("The Justice Department, on behalf of the EPA, today filed seven lawsuits against electric utility companies in the Midwest and South, charging that 17 of the companies' power plants illegally released massive amounts of air pollutants for years, which have contributed to some of the most severe environmental problems facing the United States today. The EPA today also issued an administrative order against the Tennessee Valley Authority, charging the federal agency with similar violations at seven plants.").

139. See *Grimshaw v. Ford Motor Co.*, 174 Cal. Rptr. 348, 376 (Ct. App. 1981). In *Grimshaw*, Ford's decision to expose consumers to the risk of an exploding gas tank was based on a problematic "cost-benefit analysis" that balanced egregiously undervalued "human lives and limbs against corporate profits." *Id.* at 384. Profit maximizers must know that the worst-case scenario (including punitive damages liability) is more serious than

The penalty against a coal-fired plant must be large enough so that other owners or operators of coal-fired plants are not tempted to cut corners on safety when constructing or modifying an electricity generating facility. The Supreme Court has recognized that “all civil penalties have some deterrent effect,”¹⁴⁰ but “a threat [of a penalty] has no deterrent value unless it is credible that it will be carried out.”¹⁴¹ A large body of law and economics literature notes that efficient deterrence depends on sufficient punishment for failure to obey the law.¹⁴² Research on the relationship between environmental compliance and deterrence concludes that:

First, environmental monitoring and enforcement activities generate substantial specific deterrence, reducing future violations at the targeted firm. Second, environmental monitoring and enforcement activities generate substantial general deterrence, reducing future violations at facilities other than the targeted one. Third, environmental monitoring and enforcement activities generate not only reductions in violations, but also significant reductions in emissions.¹⁴³

The EPA singled out coal-fired plants as a key enforcement priority because there was widespread noncompliance with the CAA’s new source permitting law.¹⁴⁴

merely paying only what was owed in the first place (compensatory damages and a criminal sanction), plus legal expenses. Under California law, the maximum criminal penalty for violating federal automobile safety standards would have been \$1,000 per vehicle (and up to a maximum of \$800,000), an amount dwarfed by Ford’s net worth of \$7.7 billion and its after-tax income of \$983 million. *Id.* at 388-89.

140. *Friends of the Earth, Inc. v. Laidlaw Envtl. Servs. (TOC), Inc.*, 528 U.S. 167, 185 (2000) (quoting *Hudson v. United States*, 522 U.S. 93, 102 (1997)) (internal quotation marks omitted).

141. *Id.* at 186.

142. *See, e.g.*, 1 DAN B. DOBBS, *LAW OF REMEDIES: DAMAGES-EQUITY-RESTITUTION* § 3.11(3) (2d ed. 1993); W. PAGE KEETON ET AL., *PROSSER AND KEETON ON THE LAW OF TORTS* § 2 at 9, 11-12 (5th ed. 1984); WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF TORT LAW* (1987); Dorsey D. Ellis, Jr., *Fairness and Efficiency in the Law of Punitive Damages*, 56 S. CAL. L. REV. 1 (1982).

143. WAYNE B. GRAY & JAY P. SHIMSHACK, *INT’L NETWORK FOR ENVTL. COMPLIANCE & ENFORCEMENT, ENVIRONMENTAL MONITORING AND ENFORCEMENT IN THE UNITED STATES: EMPIRICAL EVIDENCE FROM THE ECONOMICS LITERATURE* (n.d.), available at http://www.inece.org/conference/9/papers/GrayShimshack_US_FINAL.pdf (last visited Mar. 24, 2013).

144. *National Enforcement Initiatives for Fiscal Years 2008 - 2010: Clean Air Act: New Source Review/Prevention of Significant Deterioration*, *supra* note 38. The “EPA determined that many sources made changes to existing facilities without applying for and

B. Internalization Versus Gain Stripping Models of Deterrence

Economics-based deterrence theory suggests two broad approaches to punishment: internalization and gain elimination. Efficient deterrence requires that a court carefully consider both the benefit captured through an offense and the gravity of such offense. A gain stripping civil penalty only returns a utility “to the *status quo ante*, which does not adequately communicate the wrongness of the action; adding the reprehensibility-based fine makes the defendant worse off for his culpable conduct, as he should be from a retributive perspective.”¹⁴⁵ Gain stripping removes the economic incentive for noncompliance by taking back the ill-gotten gains.¹⁴⁶ The goal of the punishing authority is to shift all of the costs imposed on society by the offender’s misconduct back onto the offender—i.e., to force the offender to pay the full societal costs of harmful conduct.¹⁴⁷ Thus, the CAA penalty must be high enough to reflect total societal harm.¹⁴⁸

obtaining pre-construction permits. The lack of . . . permitting likely indicates that many stationary sources are illegally emitting thousands of tons of pollution into the environment by avoiding these Clean Air Act (CAA) requirements.” *Id.* Coal-fired plants were selected as one of four industrial sectors to investigate “based on the probability of past modifications that require NSR/PSD permits and the overall emissions.” *Id.* The other sectors selected were “cement manufacturing facilities, sulfuric and nitric acid manufacturing facilities, and glass manufacturing facilities.” *Id.*

145. Dan Markel, *Retributive Damages: A Theory of Punitive Damages as Intermediate Sanction*, 94 CORNELL L. REV. 239, 297 (2008). “Economists conventionally seek to implement the goal of complete deterrence by setting penalties that strip any gain to the defendant from the misconduct, thereby removing any incentive to engage in the conduct.” *Id.* at 242.

146. Catherine M. Sharkey, *Economic Analysis of Punitive Damages: Theory, Empirics, and Doctrine*, in RESEARCH HANDBOOK ON THE ECONOMICS OF TORTS (Jennifer H. Arlen ed., forthcoming 2013), available at http://papers.ssrn.com/soL3/papers.cfm?abstract_id=1990336. (“The primary goal of gain elimination is the complete deterrence of socially unproductive activities; the primary goal of the property rights model is facilitation of voluntary market transfers.”); see also *United States v. 2639 Meetinghouse Rd.*, 633 F. Supp. 979, 994 (E.D. Pa. 1986) (explaining how gain stripping works in the context of forfeiture).

147. See Keith N. Hylton, *Punitive Damages and the Economic Theory of Penalties*, 87 GEO L.J. 421, 421 (1998) (“Generally, complete deterrence is accomplished by eliminating the prospect of gain on the part of the offender.”).

148. See Robert D. Cooter, *Punitive Damages for Deterrence: When and How Much?*, 40 ALA. L. REV. 1143, 1148 (1988) (“In the absence of punitive damages, enforcement errors enable injurers to externalize a portion of expected social costs that they cause. Punitive damages should be set . . . at a level that eliminates the advantage of noncompliance and forces potential injurers to internalize the expected social costs of their actions.”).

Gain elimination is accomplished by ensuring that the penalty imposed on the offender is at least as great as the offender's realized or expected benefit.¹⁴⁹ Conceptually, this gain consists of at least (1) the direct savings from not implementing sufficient pollution control equipment or processes to achieve the MACT emission reduction levels required by a permit,¹⁵⁰ (2) the interest on borrowed money that would accrue during the period of construction suspension associated with securing the MACT approval, and (3) the present-day value of thirty years' cash flow delayed for the period of time it would have taken a plant to secure its MACT approval. The actual CAA penalty imposed on the offender should be at least as large as this minimum gain stripping level and also be calibrated to the seriousness of the potential harm to the health of the millions of Americans affected by emitting tons of HAPs into the environment.¹⁵¹

Without a proactive calculation, profit-maximizing polluters would simply wait until they were caught violating the law before they complied. The cornerstone of the EPA's civil penalty program is to recapture any economic benefit obtained from violating the law. The EPA then adds to this figure an amount reflecting the seriousness of the violation with respect to the radius and severity of the harm. The resulting figure is a baseline for determining the size of the penalty.

C. The EPA's Restorative Justice Mandate

The EPA's jurisprudence is not just about deterrence. Congress granted the EPA the authority to impose substantial civil penalties to enforce the Clean Air Act,¹⁵² specifically declaring that monetary penalties are

149. See Hylton, *supra* note 147.

150. The EPA has proposed a set of categorical MACT emission levels for coal-fired plants. The EPA proposal determined that acid gases, such as HF and HCl, would be adequately controlled in new power plants, if SO₂ were limited to 0.40 lb/MWh. 76 Fed. Reg. 24,976 (May 3, 2011) (to be codified at 40 C.F.R. pts. 60, 63).

151. The United States Supreme Court has made it clear in its punitive damages jurisprudence that not just actual harm, but also "potential" harm, can be considered when determining whether an award is excessive. In *TXO Production Corp. v. Alliance Resources Corp.*, the Court upheld a punitive damages award of ten million dollars where actual damages were slight because there was sufficient evidence demonstrating the potential damages arising from the energy company-defendant's bad faith slander of title. 509 U.S. 443, 462 (1993). Later, in *BMW of North America, Inc. v. Gore*, the Court recognized that the ratio of a punitive damages award could consider both actual and potential harm. 517 U.S. 559, 582 (1996). In these cases, the Court made clear that the potential harm to other victims is a factor in setting punishment.

152. The EPA's penalty policy applies to all of its statutory programs:

In the late 1970's, the United States Congress gave EPA the authority to

“necessary for deterrence, restitution and retribution.”¹⁵³ The 1984 Policy on Civil Penalties “establishes three general goals: deterrence, fair and equitable treatment, and swift resolution of environmental problems.”¹⁵⁴ This empirical study demonstrates that the EPA utilizes restorative justice principles to supplement deterrence in achieving this three-part mandate. The EPA settlement mitigation projects and restorative injunctions share common ground with the core principles of restorative justice. Restorative justice is “woven throughout the fabric of the EPA’s mission”¹⁵⁵ when it approves reparation or supplemental environmental projects that have a close nexus to the individual defendant’s offense.¹⁵⁶

impose substantial civil penalties in what was then its four major statutory programs: Clean Water Act (also referred to as the Federal Water Pollution Control Act), Clean Air Act, Toxic Substances Control Act (TSCA), and the Resource Conservation and Recovery Act (RCRA). The Agency realized that the water and air cases would be generating large civil penalties, and the EPA sought to make the assessment of civil penalties a rational process. On April 11, 1978, the Agency issued a penalty policy addressing the major air and water violations. That policy directed litigation teams to calculate the violator’s economic benefit from violating the law as part of the penalty assessment process.

Jonathan Libber, *Making the Polluter Pay: EPA’s Experience in Recapturing a Violator’s Economic Benefit from Noncompliance*, in FIFTH INTERNATIONAL CONFERENCE ON ENVIRONMENTAL COMPLIANCE AND ENFORCEMENT 465, 465 (1989), available at <http://www.inece.org/5thvol1/libber.pdf>.

153. S. REP. NO. 101-228, at 373 (1989), reprinted in 1990 U.S.C.C.A.N. 3385, 3756.

154. DANIEL RIESEL, ENVIRONMENTAL ENFORCEMENT: CIVIL AND CRIMINAL § 4.04 (1997).

155. J.P. Suarez, *Integrating Environmental Justice at the Environmental Protection Agency*, HUMAN RIGHTS, Fall 2003, at 8, 9 (published by the ABA Section of Individual Rights & Responsibilities), available at http://www.americanbar.org/publications/human_rights_magazine_home/human_rights_vol30_2003/fall2003/irr_hr_fall03_epa.html.

156. Brooke E. Robertson, Note, *Expanding the Use of Supplemental Environmental Projects*, 86 WASH. U. L. REV. 1025, 1025 (2009).

One of the most limiting of these requirements is the nexus requirement, which states that there must be an adequate “relationship between the violation and the proposed project.” In some situations, there is simply no feasible project that meets this nexus requirement; therefore, an SEP cannot be included in the settlement. After the EPA accepts the proposed project, it determines the appropriate percentage to lower the penalty.

Id. at 1026 (footnote omitted).

Restorative justice is a jurisprudential tradition that “emphasizes repairing the harm caused or revealed by unjust behavior.”¹⁵⁷ This paradigm stresses reparations by the wrongdoer rather than retributive justice.¹⁵⁸ Most proponents of this jurisprudential perspective focus on reintegrating violent criminals into the community by requiring them to right wrongs with the victim.¹⁵⁹ We extend restorative justice principles to the EPA’s mitigation projects and injunctive relief when a utility agrees to undertake projects to improve the environment. In each of the twenty-two cases analyzed, the EPA and the settling defendant agreed to reparative projects that attempted to rectify environmental harm caused by preventable air pollutants.

The EPA’s encouragement of Supplemental Environmental Projects (SEPs) in settlements is reparative, not retributive. SEPs are “environmentally beneficial project[s] that a defendant agrees to undertake in settlement of an enforcement action, but which the defendant is not otherwise legally required to perform.”¹⁶⁰ The ABA Survey on SEPs confirms that the restorative justice dimension is designed “to improve or repair relationships among all stakeholders (i.e., impacted communities, facilities, and government, at all levels) following an environmental violation.”¹⁶¹

D. SIGECO Settlement as a Case Study of Restorative Justice

Since all twenty-two settlements involved the same general pattern of wrongdoing, it is sufficient to explore only a small sample of EPA coal-fired plant resolutions in detail.¹⁶² The environmental costs of permitting

157. Carolyn Raffensperger, *Restorative Justice and the BP Catastrophe*, SCI. & ENVTL. HEALTH NETWORK (June 21, 2010), <http://www.sehn.org/blog/?p=394> (internal quotation marks omitted).

158. See MARTIN WRIGHT, *JUSTICE FOR VICTIMS AND OFFENDERS: A RESTORATIVE RESPONSE TO CRIME* 42 (Waterside Press, 2d ed. 1996) (1991).

159. DANIEL W. VAN NESS & KAREN HEETDERKS STRONG, *RESTORING JUSTICE: AN INTRODUCTION TO RESTORATIVE JUSTICE* 14 (4th ed. 2010); see also Mary Ann Yeats, “*Three Strikes*” and *Restorative Justice: Dealing with Young Repeat Burglars in Western Australia*, 8 CRIM. L.F. 369 (1997).

160. DAVID WOOLEY & ELIZABETH MORSS, *CLEAN AIR ACT HANDBOOK* § 11:26 (2012).

161. NICHOLAS TARG ET AL., PUB. LAW RESEARCH INST., *Preface* to *SUPPLEMENTAL ENVIRONMENTAL PROJECTS: A FIFTY STATE SURVEY WITH MODEL PRACTICES* 3 (Steven Bonorris ed., 2007), available at http://www.uchastings.edu/site_files/plri/ABAHastingsSEPreport.pdf.

162. The Clean Air Act permits private citizens and environmental groups to initiate enforcement actions. See David T. Buente, *Citizen Suits and the Clean Air Act Amendments of 1990: Closing the Enforcement Loop*, 21 ENVTL. L. 2233, 2249 (1991). These “private attorneys general actions” are beyond the scope of this article.

violations at Southern Indiana Gas and Electric Company's (SIGECO) F.B. Culley Station coal-fired generating plant illustrate the aggravating circumstances that led the EPA to launch its enforcement initiative.¹⁶³ Table 9 depicts the annual death and disease toll from fine particle pollution for SIGECO's F.B. Culley Generating Station, a 415-megawatt electricity-generating power plant, located in Warrick County, Indiana, on the bank of the Ohio River.¹⁶⁴

Table 9: Death and Disease Attributable to Fine Particle Pollution Emitting From F.B. Culley Generating Station, a 415-Megawatt EGU¹⁶⁵

Type of Impact	Annual Incidence	Valuation
Deaths	10	\$72,000,000
Heart Attacks	15	\$1,600,000
Asthma Attacks	160	\$8000
Hospital Admissions	7	\$160,000
Chronic Bronchitis	6	\$2,600,000
Asthma ER Visits	10	\$4000

The excessive and preventable air pollutants emitted by coal-fired energy plants pose real-world consequences for the health and welfare of surrounding communities, which justifies the EPA's campaign to enforce permitting regulations. The EPA's notice of violation charged the utility

163. *Southern Indiana Gas and Electric Company (SIGECO) F.B. Culley Plant Clean Air Act Settlement*, *supra* note 114 (explaining Clean Air Act violations at SIGECO's F.B. Culley coal-fired power plant (Culley Station) that led to settlement).

164. *F.B. Culley Generating Station*, CTR. FOR MEDIA & DEMOCRACY, http://www.sourcewatch.org/index.php?title=F._B._Culley_Generating_Station (last visited Mar. 24, 2013). *See generally* *Death and Disease from Power Plants*, CLEAN AIR TASK FORCE, http://www.catf.us/fossil/problems/power_plants/existing/map.php?state=Indiana (last visited Mar. 24, 2013) ("In 2000 and again in 2004, Abt Associates issued a study commissioned by the Clean Air Task Force, quantifying the deaths and other health affects [sic] attributable to the fine particle pollution from power plants. In this newly updated study, CATF examines the progress towards cleaning up one of the nation's leading sources of pollution. The report finds that over 13,000 deaths each year are attributable to fine particle pollution from U.S. power plants. This is almost half the impact that our 2004 study found and is reflective of the impact that state and federal actions have had in reducing power plant emissions by roughly half. However, much more still needs to be done.").

165. *Death and Disease from Power Plants*, *supra* note 164.

with making modifications at its Culley Station such as replacing components, economizers, outlet sections of secondary super heaters, and a feed water heater, without obtaining a PSD permit.¹⁶⁶ The EPA contended that none of SIGECO's modifications fell within the "'routine maintenance, repair and replacement' exemption."¹⁶⁷

The EPA notice charged SIGECO with violations that "resulted in the release of massive amounts of sulfur dioxide ('SO₂'), nitrogen oxides ('NO_x') and particulate matter ('PM') into the environment."¹⁶⁸ SIGECO not only violated the EPA's PSD requirements, but also Indiana's State Implementation Plan (SIP) that prohibited "construction or operation of a major modification of a major stationary source in an attainment area without first obtaining a PSD permit."¹⁶⁹ The EPA and Department of Justice announced a settlement with SIGECO on June 6, 2002.¹⁷⁰ This settlement, like all others in the sample, consisted of three principal parts: (1) the civil penalty, (2) required mitigation projects, and (3) the cost of complying with the EPA's injunction.¹⁷¹ SIGECO agreed to pay a \$600,000 penalty and undertake mitigation projects with a nexus to the harm it caused.¹⁷² Finally, it agreed to expend thirty million dollars to install state-of-the-art pollution controls and reduce emissions to comply with the injunction.¹⁷³ This unique blending of deterrence and restorative penalties is

166. U.S. EPA, Notice of Violation in the Matter of Southern Indiana Gas and Electric Company (n.d.), available at <http://www.epa.gov/compliance/resources/novs/civil/caa/nov-coal-sigeco.pdf> (last visited Mar. 24, 2013).

167. *Id.* at 3 (quoting 40 C.F.R. § 52.21(b)(2)(iii)).

168. *Id.* at 1.

169. *Id.* at 2.

170. *Southern Indiana Gas and Electric Company (SIGECO) F.B. Culley Plant Clean Air Act Settlement*, *supra* note 114.

171. *See id.* Appendix A contains details of all the EPA settlements analyzed.

172. *Id.* ("Under the settlement SIGECO agreed to spend at least \$2.5 million for an environmental project, the Sulfuric Acid Reduction Project, at the Culley Station. The Sulfuric Acid Reduction Project is designed to reduce the SO₃ (sulfuric acid) content in flue gas at the plant's largest unit."). *See generally* Robertson, *supra* note 156, at 1044 (explaining the nexus policy where the EPA requires projects have a connection to the harm).

173. *Southern Indiana Gas and Electric Company (SIGECO) F.B. Culley Plant Clean Air Act Settlement*, *supra* note 114. The settlement requires SIGECO to spend "an estimated \$30 million over a 4 to 6-year period to implement the following injunctive relief: [r]educe emissions of SO₂ from about 9,800 tons per year to about 3,400 tons per year." *Id.* Further:

SIGECO will either retire or repower with natural gas and state-of-the-art pollution controls a third unit. In addition, SIGECO will surrender excess SO₂ emission allowances each year beginning in 2004. This surrender will prevent SIGECO and others from using these allowances to emit additional pollution

seen in mitigation projects agreed to by the utilities in the other twenty-one settlements as well.¹⁷⁴

E. The TVA Settlement's Restorative Obligations

The April 14, 2011, EPA settlement with the Tennessee Valley Authority¹⁷⁵ also illustrates how the EPA penalty and remedial measures policies operate in tandem to achieve restorative justice as well as deterrence. The EPA first targeted the TVA in November 1999 for modifying its coal-fired plants “without first complying with Clean Air Act (CAA) preconstruction obligations that include[d] obtaining preconstruction permits and installing and operating state-of-the-art pollution control technology.”¹⁷⁶ The TVA settlement resolved permitting violation charges at eleven of its fifty-nine coal-fired plants.¹⁷⁷ The energy provider agreed to pay the U.S. Treasury ten million dollars as a civil penalty and spend an additional \$350 million for life-saving environmental

into the environment.

[SIGECO will also] [a]chieve 4,200 tons of NOx reductions annually from SIGECO coal-fired plants by operating a new state-of-the art [sic] selective catalytic reduction control system all year long, on the largest unit at the plant. In addition, SIGECO will either shut down a second unit or repower that unit with natural gas and install a state-of-the-art selective catalytic reduction system.

[Finally, SIGECO will] [i]nstall a state-of-the-art Baghouse at the largest unit by 2007 to reduce emissions of PM by an estimated additional 200 tons, as well as optimize current PM controls at all three units to control PM emissions on all units in the interim.

Id.

174. See Appendix A, containing descriptions of all the EPA settlements included in our analysis.

175. The TVA “is a corporation owned by the United States government, created and existing pursuant to the Tennessee Valley Authority Act of 1933, 16 U.S.C. § 831-831ee.” *Tennessee Valley Authority Clean Air Act Settlement*, *supra* note 11.

176. *Id.*

177. *Id.* The TVA settlement included the following eleven coal-fired plants:

Allen Fossil Plant near Memphis, Tenn.[] Bull Run Fossil Plant near Oak Ridge, Tenn.[] Colbert Fossil Plant in Tusculmbia, Ala.[] Cumberland Fossil Plant in Cumberland City, Tenn.[] Gallatin Fossil Plant in Gallatin, Tenn.[] John Sevier Fossil Plant near Rogersville, Tenn.[] Johnsonville Fossil Plant near Waverly, Tenn.[] Kingston Fossil Plant near Kingston, Tenn.[] Paradise Fossil Plant in Drakesboro, Ky.[] Shawnee Fossil Plant near Paducah, Ky.[] and] Widows Creek Fossil Plant near Stevenson, Ala.

Id.

mitigation projects.¹⁷⁸ The TVA's obligations included new air pollution controls, the repowering of renewable biomass, and a commitment to retire old coal-fired units.¹⁷⁹

The SIGECO and the TVA settlement defendants agreed to "heal and put things as right as possible" by financing pro-environmental projects.¹⁸⁰ The parallel to restorative justice lies in the utilities' symbolic demonstrations of good faith in embarking on specific projects for the common good. Just as restorative justice focuses on the healing of the breach, the wrongdoer, and the victim through remedial action,¹⁸¹ the EPA's mitigation projects require

178. *Id.* The TVA will pay:

[An] estimated \$3 to \$5 billion on new and upgraded state-of-the-art pollution controls that will prevent approximately 1,200 to 3,000 premature deaths, 2,000 heart attacks and 21,000 cases of asthma attacks each year, resulting in up to \$27 billion in annual health benefits. TVA will also invest \$350 million on clean energy projects that will reduce pollution, save energy and protect public health and the environment.

Id.

179. *Id.* The TVA agreed to meet the following obligations:

An obligation to address 92 percent of TVA's coal-fired system between 2011 and 2018 with either the installation of state-of-the-art pollution controls such as selective catalytic reduction (SCR) or flue gas desulfurization (FGD), retirement, or repowering to renewable biomass: [(1)] For NO_x, 60 percent of TVA's coal-fired system will be equipped with SCR, 16 percent will be retired, and 16 percent have the option to retire, retrofit with SCR, or repower to renewable biomass[; (2)] For SO₂, 51 percent of TVA's coal-fired system will be equipped with FGD, 16 percent will be retired, and 25 percent have the option to retire, retrofit with FGD, or repower to renewable biomass[; and (3)] Permanent retirement of 18 coal-fired units equating to about 16 percent of TVA's coal-fired electricity generating system—the largest retirement commitment any settling company has made to date under EPA's Coal-Fired Power Plant Initiative.

Id.

180. HOWARD ZEHR, *THE LITTLE BOOK OF RESTORATIVE JUSTICE* 37 (2002).

181. *Restorative Justice*, MEDIATION & RESTORATIVE JUSTICE CTR., <http://mrjc.ca/restorative-justice/> (last visited Mar. 24, 2013) (defining the principles of restorative justice as: "Hold the offender accountable to the victim and the community harmed or impacted by the crime[;] [r]equire the offender to take responsibility for 'making things right' as much as possible[;] [g]ive the victim a voice, and access to justice, by allowing the victim to participate in how the offender will be made accountable and redress the harm[; and] [i]nvite the community to join in supporting the victim, holding the offender accountable, and providing opportunities for the offender to rejoin the community[.]"); see also Hadar Dancig-Rosenberg & Dana Pugach, *Pain, Love, and Voice: The Role of Domestic Victims in Sentencing*, 18 MICH. J. GENDER & L. 423, 442 (2012) (stating the purpose of restorative justice is to require the wrongdoer to remedy injuries and thus "promote repair, reconciliation, and security").

the defendant to make a public demonstration of repairing the harm. Restorative justice aims to restore harmony based on a feeling that justice has been done.

F. Reconceptualizing Restorative Justice for Environmental Wrongs

The literature on restorative justice is overwhelmingly individualistic in orientation, dealing with questions such as the proper shaming and reintegration procedures for criminal offenders.¹⁸² The core value of any restorative justice program is an emphasis on “moral accountability of an offender toward the victim and the affected community.”¹⁸³ Restorative justice theorists’ core principles, however, can be stretched to righting civil wrongs.¹⁸⁴ The moral accountability of corporate polluters should include some service to the victim, which, in this reconceptualization, is not just an individual sufferer. Here, the victims are a statistical category in the community downwind from the toxic air or water.

The primary direct casualties in these CAA coal-fired plant settlements are the victims of toxic air suffering cardiac arrest, cancer, or developmental problems. The specific victims of air toxins, however, cannot be identified with certainty and therefore are unlikely to prevail in traditional tort litigation against polluters.¹⁸⁵ Epidemiological estimates can only determine the long-term probabilities of harm, not necessarily the identities of individual victims.¹⁸⁶ Therefore, the best restorative justice proxy for specific victims is to draw upon environmental experts and local

182. See William S. Laufer & Alan Strudler, *Corporate Crime and Making Amends*, 44 AM. CRIM. L. REV. 1307, 1309 (2007); Paul H. Robinson & John M. Darley, *Intuitions of Justice: Implications for Criminal Law and Justice Policy*, 81 S. CAL. L. REV. 1, 12-13 (2007).

183. 42 U.S.C. § 3796ee(c) (2006). This emphasis on accountability to the victim is critical to the restorative justice programs for juveniles at the federal level. See *id.*

In this section the term “restorative justice program” means a program that emphasizes the moral accountability of an offender toward the victim and the affected community and may include community reparations boards, restitution (in the form of monetary payment or service to the victim or, where no victim can be identified, service to the affected community), and mediation between victim and offender.

Id.

184. JOHN BRAITHWAITE, *RESTORATIVE JUSTICE AND RESPONSIVE REGULATION* (2002) (proposing the application of restorative justice solutions to white-collar crime, war crimes, and political crimes).

185. See Bert Black & David E. Lilienfeld, *Epidemiologic Proof in Toxic Tort Litigation*, 52 FORDHAM L. REV. 732, 749-50 (1984).

186. See *id.*

leaders to represent the interests of the community. The public's greater input will not only help design community supported projects to repair environmental harms, but also emphasize the need for polluters to undo wrongs by sending signals of healing, responsibility, and preventative vigilance.¹⁸⁷

Restorative justice requires the EPA to continue to inspect coal-fired plants—investigating the facts, filing enforcement actions, and negotiating the settlement of each case. However, restorative justice, in its purest form, calls for some direct input from the victims of these air toxins to determine projects that the utilities should undertake to rectify the harm inflicted. In the remedies stage, the EPA could encourage public participation in determining which projects would best remediate the defendant's harm.¹⁸⁸ This process would give the defendant-corporation increased opportunities to understand the specific health problems that it has caused and to help “develop plans for taking appropriate responsibility.”¹⁸⁹

Civil mitigation through restorative projects and requiring the polluter to shoulder the costs of complying with injunctions are both policies that are consistent with the principles of restorative justice. Companies agreeing to make amends share common ground with reparative projects to integrate individual offenders into the community.¹⁹⁰ When a utility agrees to install pollution control equipment to reduce by hundreds of tons the sulfur dioxide and nitrogen oxides being emitted, it is undertaking a reparative project. The participation of environmental groups would make it clear that coal-fired plants or other environmental offenders owe a primary obligation

187. See *Fundamental Concepts of Restorative Justice*, NAT'L INST. OF JUSTICE, <http://www.nij.gov/nij/topics/courts/restorative-justice/fundamental-concepts.htm> (last visited Mar. 24, 2013) (“A restorative justice process maximizes the input and participation or [sic] these parties—but especially primary victims as well as offenders—in the search for restoration, healing, responsibility and prevention.”).

188. In the first decade of the coal-fired plant enforcement initiative, the final settlements often involved greater sums expended for civil mitigation projects than for civil penalties. See *supra* Table 1 (comparing mean and median award amounts for civil penalties with civil mitigation projects). This is consistent with the National Institute of Justice's principle that “restitution take[s] priority over other sanctions and obligations to the state such as fines.” *Fundamental Concepts of Restorative Justice*, *supra* note 187. Appendix A, the data underlying the findings of our study, reveals that the EPA implemented restitution principles in civil mitigation projects as well as the cost of complying with injunctions.

189. *Fundamental Concepts of Restorative Justice*, *supra* note 187.

190. “Restoration is not required unless the ends of justice require it.” *Persson v. Smart Inventions, Inc.* 23 Cal. Rptr. 3d 335, 346 (Ct. App. 2005) (quoting *Sime v. Malouf*, 212 P.2d 946, 963 (Cal. Dist. Ct. App. 1949) *as amended on denial of reh'g*, 213 P.2d 788 (1950)).

both to the immediate victims and to the affected communities, where air and water have been degraded by emitting pollution or dumping wastes.¹⁹¹ “Environmental justice, which seeks to protect minority and low-income communities from disproportionate amounts of environmental degradation,” clearly has a restorative justice dimension.¹⁹²

The EPA’s jurisprudence is not limited to coal-fired plant litigation. The EPA often requires defendants to engage in environmentally beneficial projects to settle environmental enforcement actions:

[Supplemental Environmental Projects (SEPs)] are “environmentally beneficial projects which a defendant . . . agrees to undertake in settlement of an enforcement action, but which the defendant . . . is not otherwise legally required to perform.” In settlements of environmental enforcement actions, the EPA generally requires alleged violators to comply with federal environmental regulations and to pay a monetary penalty. The EPA will reduce the required payment in certain enforcement actions if the alleged violator agrees to perform a Supplemental Environmental Project as part of the settlement. The inclusion of SEPs in settlements furthers the “EPA’s goals to protect and enhance public health and the environment.” In its June 2003 memorandum, the EPA noted that SEPs are being underutilized and that there is tremendous potential to achieve even greater benefits for the environment with the increased use of SEPs in settlements.¹⁹³

191. Few scholars have recognized restorative environmental justice in EPA enforcement. The Public Law Institute identified a restorative justice dimension in Supplemental Environmental Projects (SEPs):

Affected communities stand to benefit from SEPs, as well, particularly as SEPs encourage restorative justice. The nexus requirement in most SEP policies results in local or regional environmental projects that help the area that suffered from the violation in the first place. A particular example of restorative justice is the policy goal of environmental justice.

Steven Bonorris et al., *Environmental Enforcement in the Fifty States: The Promise and Pitfalls of Supplemental Environmental Projects*, 11 HASTINGS W.-N.W. J. ENVTL. L. & POL’Y 185, 204-05 (2005) (footnote omitted).

192. *Id.* at 211.

193. Robertson, *supra* note 156, at 1025 (alterations in original) (footnotes omitted). “The seven specific categories [through which a project may qualify as an SEP] are as follows: public health, pollution prevention, pollution reduction, environmental restoration and protection, assessments and audits, environmental compliance promotion, and emergency planning and preparedness.” *Id.* at 1031-32 (footnotes omitted); *see also*

At present, the EPA has not adopted the restorative justice principle of seeking the participation of affected communities in determining supplemental environmental projects. The EPA could work with community groups on polluter and affected community reconciliation and restitution, which may result in victim impact statements.¹⁹⁴ Restorative justice in civil enforcement might include restitution, community service, and reparative community-based projects to right probabilistic civil wrongs that affect diffuse victims.

G. Restorative Justice as an Emergent Enforcement Paradigm

The principles of restorative justice are prefigured in the enforcement practices of other federal agencies. The Federal Trade Commission (FTC) requires violators to take affirmative steps to repair wrongs, as well as to prevent fraudulent, deceptive, and unfair business practices in the future.¹⁹⁵ Restorative justice has the potential to address the current global financial crisis by requiring lenders to take affirmative steps to help repair wrongs in affected communities.¹⁹⁶ The FTC's settlement with Countrywide (and its

Bonorris et al., *supra* note 191, at 188 (“Supplemental Environmental Projects (SEPs) are environmentally beneficial projects that go beyond compliance and are undertaken as part of a settlement of an enforcement action[.] EPA may mitigate a portion of the civil penalty that otherwise might have been assessed. The project must improve, protect or reduce risks to public health or the environment. Further, the project must be implemented entirely after the EPA has identified a violation in order to be part of a ‘settlement of an enforcement action.’” (footnotes omitted)).

194. Corporations are artificial persons, so remorse is not achievable. But the human agents of a corporation can be made more accountable through restorative justice. Stephanos Bibas & Richard A. Bierschbach, *Integrating Remorse and Apology into Criminal Procedure*, 114 YALE L. J. 85 (2004) (building a case for remorse in criminal law reflecting restorative justice).

195. See, e.g., *Prepaid Phone Card Marketers Agree to Pay \$2.32 Million to Settle FTC Charges*, FTC (Feb. 1, 2012), <http://www.ftc.gov/opa/2012/02/millennium.shtm>. The FTC's settlement with prepaid phone card sellers required them to pay \$2.32 million but also to change their practices. *Id.* In the future, consumers must receive clear disclosures of fees and charges. *Id.* “To ensure compliance, the settlement requires defendants to routinely monitor the advertising materials displayed by their distributors and the number of minutes of talk time their prepaid calling cards deliver to consumers.” *Id.*

196. Professor John Braithwaite advocates “using restorative approaches in addressing the causes of the global financial crisis and allied financial crises.” Michael King, *Blogging the Non-Adversarial Justice Conference*, RESTORATIVE JUSTICE ONLINE (May 13, 2010), <http://www.restorativejustice.org/RJOB/blogging-the-non-adversarial-justice-conference>.

successor) reflects restorative justice principles in requiring reimbursements to homeowners harmed by unfair business practices.¹⁹⁷

The United States Consumer Product Safety Commission (CPSC) is the primary enforcer for reducing injuries and death due to consumer products.¹⁹⁸ In imposing the CPSC's \$1.25 million civil penalty against the importer of the lead-painted Thomas the Tank Engine children's toy, the Commissioner observed, "[t]he tremendous costs associated with a voluntary or CPSC-ordered recall (over \$42 million in this case) provide a significant financial deterrent."¹⁹⁹ A restorative justice approach to supplement this deterrence might call for the toy importers to develop educational programs to inform the public about the dangers of lead paint or even to remove this hazardous substance from public housing projects.

Restorative justice principles were also embodied in the Master Settlement Agreement (MSA) with America's cigarette manufacturers. "Under the Master Settlement Agreement, seven tobacco companies agreed to change the way tobacco products are marketed and pay the states an estimated \$206 billion. The tobacco company defendants agreed to finance a \$1.5 billion anti-smoking campaign, open previously secret industry documents, and disband industry trade groups"²⁰⁰ These educational projects were highly appropriate as remediation for the companies' decades-long conspiracy to conceal the dangers of tobacco products.²⁰¹

The FTC's case against R.J. Reynolds Tobacco Company contended that the use of the cartoon mascot, Joe Camel, caused children to take up

197. See *FTC Settlement with Countrywide*, FTC (June 7, 2010), <http://www.ftc.gov/bcp/cases/countrywide/index.shtml>.

198. *About CPSC*, U.S. CONSUMER PROD. SAFETY COMM'N, <http://www.cpsc.gov/en/About-CPSC> (last visited Mar. 24, 2013) ("CPSC is committed to protecting consumers and families from products that pose a fire, electrical, chemical, or mechanical hazard. CPSC's work to ensure the safety of consumer products—such as toys, cribs, power tools, cigarette lighters, and household chemicals—contributed to a decline in the rate of deaths and injuries associated with consumer products over the past 30 years.").

199. *Statement of Commissioner Anne M. Northup on the Proposed Civil Penalty Settlement of \$1,250,000 for RC2 Corporation*, U.S. CONSUMER PROD. SAFETY COMM'N (Dec. 29, 2009), <http://www.cpsc.gov/pr/northup12292009.pdf> (reporting unanimous vote to impose a civil penalty for the company's importation of toys that violated the lead paint ban).

200. *Master Settlement Agreement*, STATE OF CAL. DEP'T OF JUSTICE OFFICE OF THE ATTORNEY GEN., <http://oag.ca.gov/tobacco/msa> (last visited Mar. 24, 2013).

201. See, e.g., *Public Education Counter-Marketing Campaigns*, STATE OF OKLA., http://www.ok.gov/tset/Programs/Public_Education_Counter-Marketing_Campaigns/index.html (last visited Mar. 24, 2013) (describing states campaign against anti-smoking funded by tobacco settlement).

smoking.²⁰² However, this case was dismissed because the MSA required the tobacco company to retire the camel mascot, spend “\$1.45 billion in anti-smoking campaigns,” and “reduce[] children’s exposure to all kinds of tobacco advertising by removing cartoon figures from advertisements and public relations materials, banning cigarette-branded merchandise, reducing cigarette sponsorship of concerts and sporting events, and eliminating ads on billboards, buses, and taxis.”²⁰³

Courts should consider community victim impact and relate this factor to corporate punishment, protection of the public health, general deterrence, rehabilitation, restitution, and restorative justice.²⁰⁴ Importing concepts of restorative justice from the criminal justice system can improve the ability of civil enforcers to meet the needs of community victims, encourage greater accountability, hold corporate offenders accountable, and provide rehabilitation and reintegration of corporate wrongdoers into the larger society through reparative projects with a nexus to the harm.

Conclusion

The distinctive feature of EPA enforcement is that it not only is deterrence-based, but also embodies core principles of restorative justice. The joining of these two distinct jurisprudential traditions, both specifically and generally, deters the polluter while simultaneously repairing past wrongs through remedial projects. Whether it is pollution, internet privacy violations, inadequate information security, dangerously substandard

202. *Joe Camel Advertising Campaign Violates Federal Law, FTC Says*, FTC (May 28, 1997), <http://www.ftc.gov/opa/1997/05/joecamel.shtm>.

203. Josh Boyd, *Organizational Rhetoric Doomed to Fail: R. J. Reynolds and the Principle of the Oxymoron*, 68 WEST. J. COMM. 45, 46 (2004).

204. Restorative justice in the EPA’s coal-fired plant initiative involved polluters taking responsibility for their permitting violations and making amends to the communities whose air quality and public health were degraded. Our synthesis of deterrence-based economics with restorative justice is practical and achievable, as revealed by our data. As John Maynard Keynes reminds us,

[T]he ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist.

JOHN MAYNARD KEYNES, *THE GENERAL THEORY OF EMPLOYMENT, INTEREST, AND MONEY* 383 (Prometheus Books 1997) (1936). What is needed is for the EPA to establish forums where the owners of coal-fired plants may learn first-hand about the consequences of their actions.

products, or other practices that create diffuse harms, restorative justice seeks to make corporate persons accountable to society. The EPA's enforcement initiative demonstrates that even billion-dollar utilities can be held accountable, notwithstanding that individual victims may be diffuse and downwind from the stationary source of pollutants. The EPA might consider extending the restorative justice dimension by involving the larger community and environmental action groups more directly in its settlement and remediation efforts. Local communities surrounding new or modified coal-fired plants have a clear nexus to the environmental and social effects from excessive downwind emissions arising from the utility's failure to complete a New Source Review, and could be consulted in determining the most desirable restorative projects.

Other regulatory agencies should consider whether restorative justice principles can be utilized more extensively to repair wrongs, particularly when the harms are probabilistic estimates rather than plainly identifiable sufferers. This emergent paradigm of blended enforcement principles seems well suited for agencies such as the Consumer Products Safety Commission, the Federal Trade Commission, and the Securities and Exchange Commission, all of which enforce regulations protecting the public. The Securities and Exchange Commission, for example, could incorporate a restorative justice dimension holding defendants accountable to the victims of Rule 10b-5 violations²⁰⁵ in cases where the victims are diffuse.²⁰⁶ Courts can also become more receptive to including reparative remedies for serious violations of international human rights and humanitarian law.

Future research should be directed toward exploring whether restorative justice strengthens communities and reduces re-offending for corporate wrongdoers, as its advocates claim. For too long, the restorative justice approach has been conceptualized as diametrically opposed to deterrence models. Creative solutions that blend the best features of the two perspectives can and should be adopted.

205. See 17 C.F.R. § 240.10b-5 (2012).

206. Most academics view restorative and retributive justice as an "either or" proposition, but there are a few scholars who, like us, view restorative and retributive justice as fulfilling distinct functions. Professor Joan Heminway, for example, "argues that the increased involvement of victims in Rule 10b-5 prosecutions, as an adjunct to existing processes and penalties, may better help to satisfy societal needs for justice and vengeance, achieve desired deterrence, and effectuate investor confidence and market integrity." Joan MacLeod Heminway, *Hell Hath No Fury Like An Investor Scorned: Retribution, Deterrence, Restoration, and the Criminalization of Securities Fraud Under Rule 10b-5*, 2 J. BUS. & TECH. L. 3, 14 (2007).

APPENDIX A

Cost of Civil Penalties, Mitigation Projects, & Compliance With Injunctions in Coal-Fired Settlements & Consents (2000-2011)

Name of Company & Year	Conduct Leading to EPA Permitting Violation	Amount of Civil Penalty	Total Cost of Mitigation Project, Injunctive Relief, & Supplemental Projects	Grand Total of Combined Costs of Settlement
Tennessee Valley Authority (TVA) (2011) ²⁰⁷	“TVA modified a number of coal-fired units at nine of TVA’s plants without first complying with Clean Air Act (CAA) preconstruction obligations that include obtaining preconstruction permits and installing and operating state-of-the-art pollution control technology (CAA Prevention of Significant Deterioration/Nonattainment New Source Review provisions, 42 U.S.C. §§ 7470-7492, 7501-7515).”	\$10 million	Mitigation projects: \$350 million; in addition, cost of complying with injunctions was \$3 billion to \$5 billion (used mid-point of \$4 billion as estimate). (Total: \$4.35 billion)	\$4.36 billion EPA Docket No. CAA-04-2010-1528(b)
Northern Indiana Public Service Company (NIPSCO) (2011) ²⁰⁸	“NIPSCO modified a number of its coal-fired power units without first complying with Clean Air Act (CAA) preconstruction obligations that include obtaining pre-construction permits and installing and operating state-of-the-art pollution control technology. (CAA Prevention of Significant Deterioration/Nonattainment New Source Review provisions, 42 U.S.C. §§ 7470-7492, §§ 7501-7515; and Title V of the CAA).”	\$3.5 million	“This settlement also requires NIPSCO to spend \$9.5 million on environmental mitigation projects” and another \$600 million in costs associated with injunctive relief. (Total: \$609.5 million)	\$613 million Consent Decree, N.D. Ind.

207. *Tennessee Valley Authority Clean Air Act Settlement*, *supra* note 11.208. *Northern Indiana Public Service Company Clean Air Act Settlement*, *supra* note 28.

Hoosier Energy Rural Electric Cooperative, Inc. (2010) ²⁰⁹	"Hoosier made modifications at the Merom plant without first complying with the New Source Review program's pre-construction obligations, which include, obtaining pre-construction permits and establishing an emission limitation based upon Best Available Control Technology, in violation of: The Clean Air Act (CAA), Prevention of Significant Deterioration provisions, 42 U.S.C. §§ 7470-7492;" Indiana's State Implementation Plan and "Title V of the Clean Air Act and the Indiana Title V regulations."	\$950,000	"This settlement also requires Hoosier to spend \$5 million on environmental mitigation projects to address the impacts of past emissions" (mitigation) and \$275 million in pollution control technology that will protect public health and "resolve violations of the Clean Air Act" (estimated \$250 million to \$300 million for Injunctive Relief). (Total: \$280 million)	\$280.95 million Consent Decree, S.D. Ind.
American Municipal Power (AMP) (2010) ²¹⁰	"[M]odifications were made at the Gorsuch Station without first complying with pre-construction obligations, including obtaining pre-construction permits and installing and operating state-of-the-art pollution control technology, in violation of" the CAA, PSD/NSR Provisions and New Source Performance Standards.	\$850,000	"This settlement also requires AMP to spend \$15 million on environmental mitigation projects to address the impacts of past emissions." No cost of injunction listed on consent decree. (Total: \$15 million)	\$15.85 million Consent Decree, S.D. Ohio

209. *Hoosier Energy Rural Electric Cooperative, Inc. Settlement*, EPA (July 23, 2010), <http://www.epa.gov/compliance/resources/cases/civil/caa/hoosier.html>.

210. *American Municipal Power Clean Air Act Settlement*, EPA (May 18, 2010), <http://www.epa.gov/compliance/resources/cases/civil/caa/americanmunicipalpower.html>.

Westar Energy, Inc. (2010) ²¹¹	“Westar Energy made modifications at the Jeffrey Energy Center without first complying with pre-construction obligations, including obtaining pre-construction permits and installing and operating state-of-the-art pollution control technology, in violation of The Clean Air Act (CAA) Prevention of Significant Deterioration provisions, 42 U.S.C. §§ 7470-7492 and the Kansas State Implementation Plan (SIP)[and] Title V of the CAA and the Kansas Title V regulations.”	\$3 million	\$6 million in mitigation projects, plus \$520 million to comply with the injunction (estimated \$490 million to \$550 million). (Total: \$526 million)	\$529 million Consent Decree, D. Kan., No. 09-cv-2059
Duke Energy Gallagher Plant (2009) ²¹²	“Duke made illegal modifications to Gallagher Units 1 and 3 that caused significant increases in sulfur dioxide (SO ₂). The company made these modifications without first complying with pre-construction obligations, including obtaining pre-construction permits and installing and operating state-of-the-art pollution control technology, in violation of: The Clean Air Act (CAA) Nonattainment New Source Review and Prevention of Significant Deterioration provisions, 42 U.S.C. §§ 7470-7492, 7501-7515[, and] [t]he Indiana State Implementation Plan (Indiana SIP).”	\$1.75 million	\$6.25 million for mitigation projects and \$85 million for cost of complying with injunctions. (Total: \$91.25 million)	\$93 million Consent Decree, S.D. Ind., No. 1:99-cv-01693

211. *Westar Energy, Inc. Settlement*, EPA (Jan 25, 2010), <http://www.epa.gov/compliance/resources/cases/civil/caa/westarenergy.html>.

212. *Duke Energy Gallagher Plant Settlement*, *supra* note 94.

Kentucky Utilities Company (2009) ²¹³	"Kentucky Utilities violated the Prevention of Significant Deterioration requirements of the [Clean Air] Act and the Kentucky State Implementation Plan (SIP) by modifying and subsequently operating Brown Unit 3 without obtaining a PSD permit and without retrofitting the unit with the Best Achievable Control Technology (BACT)." In addition, "[t]he Unites [sic] States alleges that Kentucky Utilities violated the NSPS by modifying Brown Unit 3 and continuing to operate this unit without complying with NSPS emission standards and other requirements."	\$1.4 million	\$5.6 million for civil mitigation (midpoint of range which includes \$1.8 million to \$7 million + \$1 million + \$200,000) and \$135 million to install state-of-the-art pollution control technology to satisfy the injunction. (Total: \$140.6 million)	\$142 million Consent Decree, E.D. Ky., No. 5:07-cv-0075
Salt River Project Agriculture Improvement and Power District (2008) ²¹⁴	"[V]iolated the Clean Air Act by undertaking construction activities that constituted 'major modifications' at Coronado Generating Station's two coal-fired electric generating units, designated as Units 1 and 2, without first undergoing PSD review, obtaining required permits, and installing Best Available Control Technology to reduce air pollution. The United States also alleges that SRP failed to include the PSD requirements in its Title V operating permit for the plant."	\$950,000	\$4 million for mitigation projects and \$400 million for compliance with the injunction. (Total: \$404 million)	\$404.95 million Consent Decree, D. Ariz., No. 2:08-cv-1479

213. *Kentucky Utilities Company Clean Air Act Settlement*, EPA (Feb. 3, 2009), <http://www.epa.gov/compliance/resources/cases/civil/caa/kucompany.html>.

214. *Salt River Project Agriculture Improvement and Power District Settlement*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/srp.html> (last visited Mar. 24, 2013).

American Electric Power Service Corporation (AEP) (2007) ²¹⁵	“AEP made physical and operational changes at nine of its plants that constituted ‘major modifications’ without first undergoing PSD review or Non-attainment New Source Review (NNSR), obtaining required permits, and installing and operating Best Available Control Technology and/or technology reflecting the Lowest Achievable Emission Rate (LAER) to reduce air pollution.”	\$15 million	AEP will “spend \$60 million on projects to mitigate the adverse effects of its past excess emissions” and more than \$4.6 billion to implement the injunction to reduce pollutants. (Total: \$4.66 billion)	\$4.675 billion Consent Decree, S.D. Ohio, No. C2-99-1250
East Kentucky Power Cooperative (EKPC) (2007) ²¹⁶	“EKPC made physical and operational changes at the Spurlock Plant that constituted ‘major modifications’ without first undergoing Prevention of Significant Deterioration (PSD) review, obtaining required permits, and installing and operating Best Available Control Technology to reduce air pollution.”	\$750,000	The mitigatory project is “valued at \$47 million for installation of Wet Electro-Static Precipitators designed to reduce EKPC’s sulfuric acid mist emissions,” and the cost of reducing pollutants to satisfy the injunction is \$603 million. (Total: \$650 million)	\$650.75 million Consent Decree, E.D. Ky., No. 04-34
Nevada Power Company (2007) ²¹⁷	“EPA alleges Nevada Power violated the Clean Air Act by undertaking construction activities at two combustion turbines, designated as Units 5 and 6, that increased pollution without first applying for an NSR Clean Air Act permit. An NSR permit would have required Nevada Power to take steps to reduce emissions at the time of the activities.”	\$300,000	\$400,000 for mitigation projects and \$60 million cost of complying with the injunction. (Total: \$60.4 million)	\$60.7 million Consent Decree, D. Nev.

215. *American Electric Power Service Corporation Information Sheet*, *supra* note 124.

216. *East Kentucky Power Cooperative Settlement*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/eastkentuckypower.html> (last visited Mar. 24, 2013).

217. *Nevada Power Company Clean Air Act Settlement*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/nevadapower.html> (last visited Mar. 24, 2013).

Alabama Power Company (APC) (2006) ²¹⁸	“Based on information received from the company, EPA alleges that at Plant Miller APC violated the CAA by commencing construction activities that increased pollution at some units without first applying for the required permit. A permit would have required APC to take steps to reduce emissions at the time of the construction activities.”	\$100,000	\$4.9 million in mitigation projects; “APC will [also] spend approximately \$200 million between now and 2012 to install pollution controls to substantially decrease emissions from Plant Miller Units 3 and 4.” (Total: \$204.9 million)	\$205 million Consent Decree, N.D. Ala., No. 2:01-cv-00152
Minnkota Power Cooperative and Square Butte Electric Cooperative (2006). ²¹⁹	“EPA alleges Minnkota violated the Clean Air Act by undertaking construction activities that increased pollution at some units without first applying for an NSR Clean Air Act permit. An NSR permit would have required Minnkota to take steps to reduce emissions at the time of the activities.”	\$850,000	\$5 million for mitigation projects and \$100 million to comply with the injunction. (Total: \$105 million)	\$105.85 million Consent Decree, D. N.D.
Illinois Power Company and Dynegy Midwest Generation (2005) ²²⁰	“Illinois Power Company . . . violated the New Source Review provisions of the Clean Air Act at the Baldwin Power Station in Baldwin, Illinois.”	\$9 million	\$15 million in mitigation penalties and \$500 million to comply with the injunction. (Total: \$515 million)	\$524 million Consent Decree, S.D. Ill., No. 99-833

218. *Alabama Power Company Clean Air Settlement*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/alabamapower.html> (last visited Mar. 24, 2013).

219. *Minnkota Power Cooperative and Square Butte Electric Cooperative*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/minnkota.html> (last visited Mar. 24, 2013).

220. *Illinois Power Company and Dynegy Midwest Generation Settlement*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/illinoispower.html> (last visited Mar. 24, 2013).

Ohio Edison Company, W.H. Sammis Power Station, (2005) (Modified in 2009) ²²¹	"Ohio Edison undertook construction projects at the Sammis Plant in violation of the New Source Review program. In August 2003, the U.S. District Court for the Southern District of Ohio affirmed all allegations and found that Ohio Edison failed to obtain Clean Air Act permits or to install required pollution controls."	\$8.5 million	\$25 million in mitigation projects and \$1.1 billion to comply with the injunction. (Total: \$1.125 billion)	\$1.1335 billion Consent Decree, S.D. Ohio, No. 2:99-cv-1181
South Carolina Public Service Authority (Santee Cooper) (2004) ²²²	"EPA alleges Santee Cooper violated the Clean Air Act" New Source Review program at several of its plants "by undertaking construction activities that increased pollution" without installing required pollution controls.	\$2 million	\$4.5 million in mitigation projects and \$4 billion for complying with the injunction. (Total: \$4.0045 billion)	\$4.0065 billion Consent Decree, D. S.C.
Southern Indiana Gas and Electric Company (SIGECO) F.B. Culley Plant (2003) ²²³	The settlement is "to resolve Clean Air Act violations at SIGECO's F.B. Culley coal-fired power plant (Culley Station). . . . SIGECO violated the Clean Air Act by significantly modifying its Culley Station facility, and increasing its pollution output, without first applying for a Clean Air Act permit and taking steps to reduce increased emissions."	\$600,000	\$2.5 million for mitigation projects and \$30 million to comply with the injunction. (Total: \$32.5 million)	\$33.1 million Consent Decree, S.D. Ind., No. IP99-1692-C

221. *Ohio Edison Company, W.H. Sammis Power Station, Clean Air Act—2005 Settlement and 2009 Modified Settlement*, EPA (Aug. 11, 2009), <http://www.epa.gov/compliance/resources/cases/civil/caa/ohioedison.html>.

222. *South Carolina Public Service Authority (Santee Cooper)*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/santeecooper.html> (last visited Mar. 24, 2013).

223. *Southern Indiana Gas and Electric Company (SIGECO) F.B. Culley Plant Clean Air Act Settlement*, *supra* note 114.

Alcoa, Inc. (2003) ²²⁴	Alcoa unlawfully operated the Rockdale facility since it overhauled the Rockdale power plant without installing necessary pollution controls and without first obtaining proper permits required by the New Source Review program of the Clean Air Act.	\$1.5 million	\$2.5 million for mitigation projects and \$330 million to comply with the injunction. (Total: \$332.5 million)	\$334 million Consent Decree, W.D. Tex., No. A-01-CA-881
Wisconsin Electric Power Company (WEPCO) (2003) ²²⁵	“Wisconsin Electric violated the New Source Review provisions of the Clean Air Act at several of its plants by undertaking major modifications and increasing emissions of air pollution without also installing required air pollution controls.”	\$3.2 million	\$20 million for mitigation projects and \$600 million to comply with the injunction. (Total: \$620 million)	\$623.2 million Consent Decree, E.D. Wisc., No. 03-C-0371
Virginia Electric Power Company (VEPCO) (2003) ²²⁶	EPA charged VEPCO with having undertaken major modifications at their power plants without installing equipment required to control pollution that causes smog, acid rain and soot.	\$5.3 million	\$13.9 million for mitigation and \$1.2 billion for injunctive relief. (Total: \$1.2139 billion)	\$1.2192 billion Consent Decree, E.D. Va.
PSEG Fossil Inc. (2002) ²²⁷	Hudson and Mercer plants are unlawfully operating because they were modified without installing necessary pollution controls and obtaining proper permits required by the New Source Review program of the Clean Air Act.	\$6 million	\$3.25 million for mitigation projects and \$337 million for complying with the injunction. (Total: \$340.25 million)	\$346.25 million Consent Decree, D. N.J., No. 02-cv-340

224. *Alcoa, Inc. Clean Air Act Settlement*, *supra* note 71.

225. *Wisconsin Electric Power Company (WEPCO) Clean Air Act Civil Settlement*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/wepco.html> (last visited Mar. 24, 2013).

226. *Virginia Electric and Power Company (VEPCO) Clean Air Act Settlement*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/vepco.html> (last visited Mar. 24, 2013).

227. *PSEG Fossil L.L.C. Settlement*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/psegllc.html> (last visited Mar. 24, 2013).

Tampa Electric Company (TECO) (2000) ²²⁸	“[T]he government charged that Tampa Electric Company and six other utilities violated the law at their power plants by making major modifications to the plants without installing equipment required to control smog, acid rain and soot.”	\$3.5 million	\$10.5 million in mitigation projects (estimated \$10 - \$11 million). No estimate for injunctive relief was given in fact sheet or consent. (Total: \$10.5 million)	\$14.0 million Consent Decree, M.D. Fla., No. 99-2524-T
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228. *Tampa Electric Company (TECO) Clean Air Act Settlement*, EPA, <http://www.epa.gov/compliance/resources/cases/civil/caa/teco.html> (last visited Mar. 24, 2013).