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The Hidden Cost of Prosperity: Transboundary Mercury Pollution, the United States, and China

by Christopher Barraza

Editors' Summary: The largest portion of global mercury emissions comes from Asia, in particular China. Because mercury and its compounds are highly mobile and move with prevailing wind currents, China's failure to regulate mercury emissions provides ample reason for worry in the United States. In March 2005, the United States promulgated the Clean Air Mercury Rule (CAMR) to regulate mercury emissions from coal activities. Yet any reductions achieved under the CAMR program may be offset by China's economic plans and energy needs. Thus, the global nature of mercury emissions requires a comprehensive, global solution. In this Article, Chris Barraza examines current U.S. regulatory mechanisms for controlling mercury, including the CAMR, and how they fare with regard to this complex, global problem. He argues that although the cap-and-trade program established by the CAMR potentially will reduce mercury emissions from coal utilities while also protecting economic growth and stability, the creation of a trading mechanism for hazardous and potent neurotoxins is not good policy. Instead, he concludes that a cost-blind, technology-based standard is more appropriate. Further, because any reductions made in the United States could be offset by emissions produced globally, he argues that the U.S. Environmental Protection Agency should account for global loading when promulgating caps and standards. In the meantime, China, for its part, must enforce existing laws and continue to improve enforcement efforts. The author also explores ways in which the United States should work with China to bilaterally reduce mercury emissions.

I. Introduction

On March 15, 2005, the U.S. Environmental Protection Agency (EPA) promulgated the Clean Air Mercury Rule[1] (CAMR), making the United States the first country in the world to regulate mercury emissions from coal-fired electric steam-generating units (SGUs).[2] Although the United States emitted an estimated 146 tons of mercury in 2001, it only accounted for 3% of total anthropogenic global mercury emissions that year.[3] The largest sources of U.S. anthropogenic mercury emissions are SGUs[4]; however, EPA reports that they only account for a small portion of mercury deposition within the United States.[5] Thus, mercury deposition in the United States is a global problem. So, what are the sources?

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1. Standards of Performance for New and Existing Stationary Sources: Electric Steam-Generating Units, OAR-2002-0056 (Mar. 15, 2005), codified at 40 C.F.R. §§60, 63, 72, and 75 (2005) [hereinafter Final Mercury Rule]. Except where noted otherwise, all cites to the Final Mercury Rule refer to the version posted on the EPA website and are available on the Internet at http://www.epa.gov/air/mercuryrule/rule.htm (last visited Oct. 5, 2005).

2. *See* U.S. EPA, FACT SHEET—EPA'S CLEAN AIR MERCURY RULE (2005), *available at* http://www.epa.gov/mercuryrule/factsheetfin.htm (last visited Oct. 17, 2005) [hereinafter U.S. EPA FACT SHEET].

3. *See* U.S. EPA, MERCURY DEPOSITION IN THE U.S. (2005), *available at* http://www.epa.gov/mercuryrule/charts.htm (last visited Oct. 17, 2005) [hereinafter MERCURY DEPOSITION IN THE U.S.]; U.S. EPA FACT SHEET, *supra* note 2.

4. U.S. EPA, Regulatory Finding on the Emissions of Hazardous Air Pollutants From Electric Utility Steam-Generating Units, 65 Fed. Reg. 79825, 79827 (Dec. 20, 2000).

5. Of the estimated 146 tons of mercury which deposed within the United States in 2001, EPA reports that only 11 tons came from U.S. utility power plants. *See* MERCURY DEPOSITION IN THE U.S., *supra* note 3. SGUs were responsible for emitting 48.57 tons of mercury that year. *See* Revision of December 2000 Regulatory Finding on the Emissions of Hazardous Air Pollutants From Electric Utility Steam-Generating Units and the Removal of Coal- and Oil-Fired Electric Utility Steam-Generating Units From the Section 112(c) List, 70 Fed. Reg. 15993, 15994 (Mar. 29, 2005), codified at 40 C.F.R. §63 (2005) [hereinafter Regulatory Revision]. Except where noted otherwise, all cites to the Regulatory Revision refer to the version posted on the EPA website and are available on the Internet at http://www.epa.gov/air/mercuryrule/rule.htm (last visited Nov. 1, 2005).

The largest portion of global mercury emissions comes from Asia,[6] in particular China.[7] China's emissions are directly linked to its burgeoning economy and reliance on coal as a cheap and plentiful source of energy. Unlike the United States, China does not regulate mercury emissions from SGUs. China's mercury emissions will almost certainly grow over the next two decades, for China plans to quadruple the size of its economy by 2020.[8] Planned economic expansion will undoubtedly require the construction of power plants, the majority of which will likely be coal-fired.[9] Because mercury and its compounds are highly mobile and move with prevailing wind currents,[10] China's failure to regulate mercury emissions provides ample reason to worry for the United States.

Mercury has caused a variety of documented, significant adverse impacts on human health and the environment.[11] Mercury and its compounds are particularly toxic to the developing nervous system in fetuses, newborns, and young children.[12] This is particularly troubling given the likelihood that children are being exposed to toxins emitted outside the continental United States[13] and, therefore, beyond the reach of U.S. regulation, including the CAMR and the Great Lakes Initiative (GLI). A recent study tracked airborne urban pollutants including mercury from East Asia across the Pacific Ocean to the West Coast of the United States, confirming that mercury and mercury compounds are capable of traveling thousands of miles from their sources.[14] Given the nature of wind currents over the Pacific Ocean, the United States lies directly in the path of Chinese mercury emissions; therefore, China's failure to reduce or restrict mercury emissions is particularly relevant to mercury control, and public health, in the United States.

This Article investigates the global nature of mercury emissions and the resulting need for a comprehensive, global solution that includes aggressive action by both China and the United States. The recent promulgation of the CAMR only represents a small piece of what must become a coordinated cross-border effort to reduce mercury emissions. Regulating mercury emissions solely through the CAMR will fail to achieve significant reductions in mercury emissions for two fundamental reasons. This approach sacrifices health in favor of economics, and EPA's determination that a trading regime will sufficiently reduce emissions fails to consider adequately the contribution of non-U.S. sources of mercury emissions on levels of mercury in the United States.

As economic and global powers, China and the United States bear a duty to take a leadership role in efforts to reduce global mercury emissions. The United States bears an added moral responsibility to lead by example and demonstrate the mercury must be stringently regulated. The United States must alter the CAMR model to account for the effects of deposition from the global mercury reservoir and must include maximum achievable control technology (MACT)-based standards to drive development of more efficient control mechanisms. Moreover, EPA action must occur within a larger concerted global mercury emissions abatement framework.

China faces similar challenges. Although it may have little incentive to reduce emissions because of potential negative effects on planned economic growth, China can realize significant reductions without adversely affecting growth by simply enforcing regulations currently in force. China can further avoid negative effects on economic growth by collaborating with the United States through working groups. Working groups would promote sharing of data, research, and regulatory insights and would also facilitate technology transfers.

Despite its faults, the CAMR may spur development of SGU mercury control technology and thus will give U.S. pollution control technology innovators an incentive to move beyond current technologies. The development of improved or new technologies could give the innovators, many of which will be U.S. companies, a competitive advantage in the United States and globally, including in China. The result could be more efficient and less expensive control technology for utilities worldwide, including in China and the United States. Development of new technologies could also yield significant health benefits for each country. Unless the United States works with other countries, particularly China, to reduce mercury emissions, U.S. regulation of mercury will fail to reduce mercury deposition and pollution.

This Article begins with an explanation of how coal-combustion causes mercury to enter the global atmospheric cycle and depose to land and water bodies. It then evaluates some major U.S. regulatory initiatives for mercury, including the CAMR, before examining the effect of current and projected Chinese mercury emissions on current U.S. regulatory measures. Finally, it concludes with proposals for bilateral action and challenges EPA to craft aggressive mercury reduction regulation as part of a concerted, global effort to abate mercury emissions.

II. Mercury

Mercury is highly toxic, persistent, and bioaccumulative. It has been described as the hazardous air pollutant (HAP) of

6. U.N. Environment Program (UNEP), Chemicals, Global Mercury Assessment ¶ 122 (2002) [hereinafter Global Mercury Assessment].

> Whereas the mercury emissions in Europe and North America have decreased quite substantially during the period from 1990 through 1995, emissions in Asia, particularly in China and India, have increased significantly. The Asian sources contributed about 30% to the total emissions of mercury in 1990, compared to 56% in 1995. An increase of more than 250 metric tons was estimated for China between the years 1990 and 1995. The increase of mercury emissions in China from 1990 through 1995 is clearly related to the increase of coal combustion in the country.

7. *See id.*

8. *See* China Daily, *China Pledges to Curb Air Pollution*, *at* http://www.china.org.cn/english/environment/108385.htm (Sept. 29, 2004) (last visited Oct. 17, 2005).

9. *See* Matt Pottinger et al., *Invisible Export—A Hidden Cost of China's Growth: Mercury Migration*, Wall St. J., Dec. 20, 2004, at A20 [hereinafter *Invisible Export*].

10. *See generally* Carola Hanisch, *Where Is Mercury Deposition Coming From?*, 32 Envtl. Sci. & Tech. 176 (1998) ("Emissions of mercury in its elemental form can remain airborne for about a year and can be transported over thousands of miles before being oxidized and finally deposited.").

11. *See* Global Mercury Assessment, *supra* note 6, ¶ 5.

12. *Id.*

13. *See* Hanisch, *supra* note 10.

14. *See* D.J. Jacob et al., *Transport and Chemical Evolution Over the Pacific (TRACE-P) Aircraft Mission: Design, Execution, and First Results*, 108 J. Geophysical Res. 2-1, 2-2 (2003).

greatest concern to EPA.[15] Human exposure to mercury can result from a variety of pathways, including, but not limited to, consumption of fish, occupational and household uses, dental amalgams, and mercury-containing vaccines.[16]

The largest anthropogenic source of mercury emissions is coal combustion. Coal naturally contains trace amounts of mercury that are released during combustion.[17] Mercury exists in three basic forms—elemental, organic, and inorganic—all of which are emitted by SGUs.[18] Speciation plays a central role in determining how far airborne mercury travels from its source.[19] Mercury adsorbed on particles and ionic mercury compounds falls on land and water primarily in the vicinity of the sources, whereas elemental mercury vapor moves on a global scale.[20] Inorganic forms of mercury such as methylmercury (MeHg) readily depose to ground and water through precipitation. Such wet deposition is the primary mechanism for transporting mercury from the atmosphere to the ground and surface waters.[21] Understanding speciation is critical to control of mercury emissions to air.[22]

A. The Primary Pathway: MeHg in the Food Chain

The primary mercury exposure pathway to the general population is MeHg delivered through the food chain.[23] MeHg forms in the environment when elemental mercury and/or its compounds depose to soil or water bodies and interact with microorganisms.[24] MeHg quickly biomagnifies in the food chain, primarily through fish, which store MeHg in their tissues.[25] Fish tissue mercury concentrations are lowest in smaller, nonpredatory fish, and highest in predatory fish such as shark, swordfish, and tuna, all of which are commonly consumed by people.[26] Fish consumption dominates the pathway for human exposure to MeHg.[27] There is a plausible link between emissions of mercury from anthropogenic sources such as coal-fired utilities and the presence of MeHg in fish.[28]

B. The Global Mercury Cycle

When elemental mercury is released during coal combustion, the emissions plume is susceptible to transport over thousands of miles on prevailing wind currents.[29] Thus, local efforts to control mercury may be undermined by foreign point sources. Mercury speciation and emissions levels depend on factors such as coal grade, the extent and efficiency of sulfur oxide (SO_x) control technology, and what other constituents are present in the flue gas.[30]

Most mercury enters U.S. water bodies from the air.[31] EPA estimates that roughly 60% of the total mercury deposited within the United States comes from U.S. anthropogenic air emissions sources.[32] The remainder of mercury deposition from the air comes from natural emission sources, reemissions of historical global anthropogenic mercury releases, and from anthropogenic sources outside the United States.[33] SGUs,[34] the largest source of mercury emissions in the United States, are responsible for approximately 30% of U.S. anthropogenic emissions.[35] EPA estimates that SGUs emitted 48.6 tons of mercury in 2001,[36] and it projects that SGUs will emit 60 tons in 2010.[37] About one-third, roughly 47 tons, of U.S. atmospheric mercury emissions remains within and deposes inside the United States.[38] The remaining two-thirds of U.S. atmospheric mercury emissions move on wind currents and travel beyond U.S. borders and diffuse into the global atmospheric reservoir.[39] The global atmosphere reservoir contributes ap-

15. U.S. EPA, Study of Hazardous Air Pollutant Emissions From Electric Utility Steam-Generating Units—Final Report to Congress (RTC), Vol. 1, ES-27 (1998) [hereinafter Final RTC].
16. *See* Global Mercury Assessment, *supra* note 6, ¶ 5.
17. *See* U.S. EPA Fact Sheet, *supra* note 2.
18. *See* Global Mercury Assessment, *supra* note 6, ¶ 49; U.S. EPA Fact Sheet, *supra* note 2.
19. Global Mercury Assessment, *supra* note 6, ¶ 51. *See* Hanisch, *supra* note 10. Speciation is the term commonly used to represent the distribution of a quantity of mercury among its three forms. The toxicity and likelihood of exposure to humans depends in large part on speciation.
20. Global Mercury Assessment, *supra* note 6, ¶ 51.
21. U.S. EPA, Mercury Study Report to Congress (1997) (EPA 452/R-97-003) [hereinafter RTC].
22. Global Mercury Assessment, *supra* note 6, ¶ 52. ("For example, emissions of inorganic mercuric compounds (such as mercuric chloride) are captured reasonably well by some control devices (such as wet-scrubbers), while capture of elemental mercury tends to be low for most emission control devices.")
23. *Id.* ¶ 63.
24. *Id.* ¶ 47. It is generally believed that biotic processes are responsible for the majority of MeHg.
25. Global Mercury Assessment, *supra* note 6, ¶ 67 ("Nearly 100% of mercury that bioaccumulates in predator fish is methylmercury.").
26. *See id.* ¶ 66.
27. 65 Fed. Reg. at 79827 (As of July 2000, 40 states had issued fish advisories for mercury.). *See* RTC, *supra* note 21, at ES-2.
28. Final RTC, *supra* note 15, at ES-15 ("The EPA's 1997 Mercury Study Report to Congress supports a plausible link between anthropogenic releases of mercury from industrial and combustion sources in the U.S. and methylmercury in fish."). *See also* 65 Fed. Reg. at 79827 ("The available information indicates that mercury emissions from electric steam-generating units comprise a substantial portion of the environmental loadings and are a threat to public health and the environment.").
29. *See* Hanisch, *supra* note 10.
30. *See generally* Final Mercury Rule, *supra* note 1. Scientists have been able to estimate domestic and global releases of mercury. *See*, *e.g.*, Global Mercury Assessment, *supra* note 6; Hanisch, *supra* note 10; 65 Fed. Reg. at 79825.
31. 65 Fed. Reg. at 79825.
32. *Id.* The percentage is likely higher in regions such as the Northeast.
33. *Id.*
34. 40 C.F.R. §60.41a (2005) ("Electric utility steam-generating unit means any steam electric-generating unit that is constructed for the purpose of supplying more than one-third of its potential electric output capacity and more than 25 Megawatts electrical output to any utility power distribution system for sale.").
35. *See* 65 Fed. Reg. at 79825.
36. Office of Air Quality Planning & Standards, U.S. EPA, Monitoring and Analysis Division, Emissions Inventory and Emissions Processing for the Clean Air Mercury Rule 19 (2001), *available at* http://www.epa.gov/ttn/atw/utility/emiss_inv_oar-2002-0056-6129.pdf (last visited Mar. 31, 2005).
37. 65 Fed. Reg. at 79825 (The estimated emissions in 2010 do not reflect the potential reductions of early compliance with the Final Mercury Rule.).
38. *See* Hanisch, *supra* note 10.
39. *Id.*

proximately 32 tons of mercury, or 25% to 30% of mercury deposed in the United States.[40]

U.S. mercury emissions are estimated to account for roughly 3% of total global mercury emissions, including emission from U.S. coal-fired power plants that account for about 1% of the global total.[41] These figures stand in sharp contrast with emission estimates for China, which emits roughly 600 tons of mercury each year, most of which comes from coal combustion.[42] China's mercury emissions are forecast to increase significantly in the next two decades[43]; thus, China will likely increase its contribution to the global mercury reservoir, and as a result, increase the volume of mercury from non-U.S. sources deposited within the United States and, therefore, the overall percentage of mercury levels within the United States that originates outside U.S. borders.

III. U.S. Responses to Mercury

Since the 1990s, EPA has worked to address the dangers posed by mercury emissions.[44] In 1998, it submitted a report to the U.S. Congress (RTC)[45] detailing the hazards mercury posed to the environment and public health.[46] In particular, the RTC cited coal-fired utility SGUs as significant emitters of mercury.[47] The RTC further labeled mercury, a designated HAP under §112 of the Clean Air Act (CAA), as the HAP of greatest concern to public health from the utility industry.[48] This report laid the groundwork for the subsequent regulatory finding in 2000 that regulation of coal-fired utility SGUs was appropriate and necessary under CAA §112(n)(1)(A).[49] The 2000 finding was an important impetus for EPA's decision to take action to regulate SGUs. As discussed below, the policy and legal bases upon which EPA addressed SGUs in the CAMR have been controversial.

A. The CAMR Overview

The CAMR is intended to reduce mercury emissions by establishing standards of performance for new and existing SGUs under CAA §§111(b) and 111(d).[50] The CAMR caps emissions at uniform, nationwide levels in two phases. The first phase cap of 38 tons per year (tpy) becomes effective in 2010, and the second phase cap of 18 tpy becomes effective in 2018.[51] The CAMR allows regulated SGUs to trade emissions credits[52] through a mechanism modeled on EPA's SO_x control regime.[53] Facilities must demonstrate compliance with the standards by demonstrating an allowance for each ounce of mercury emitted.[54] Establishment of the cap-and-trade regime required the "delisting" of SGUs from CAA §112 and "relisting" them under CAA §111. This change had the effect of exempting SGUs from the burden of compliance with stringent MACT standards required under CAA §112, saving substantial amounts of money in compliance costs. Not surprisingly, this change is highly controversial and litigation has been filed to challenge this aspect of the CAMR.[55]

1. Regulated Units

Fossil fuel-fired combustion units that serve generators of electricity which sell 25 megawatts (MW) or greater of electricity, or sell one-third or greater of their power output capacity to any utility power distribution system, are considered a "utility unit" under the CAMR and must comply with all relevant standards of performance.[56]

The CAMR sets forth two categories of regulated facilities: new sources regulated under CAA §111(b) and existing sources regulated under CAA §111(d).[57] For new units under CAA §111(b), the rule promulgates mercury emissions limitations based upon coal rank and process type.[58] In turn,

40. *Id.* It is conceivable that domestic mercury emissions can enter the global reservoir and later return to the United States after traveling along wind currents.
41. *See* U.S. EPA Fact Sheet, *supra* note 2.
42. *See Invisible Export*, *supra* note 9. Other estimates range as high as 1,000 tons, *see Mercury Campaign*, *at* http://www.gvbchina.org/EnglishWeb/MercuryCampaign.htm (last visited Mar. 26, 2005), and as low as 273 tons, *see* Ming Quan Zhang et al., *Evaluation of Mercury Emissions to the Atmosphere From Coal Combustion, China*, 31 Ambio 482, 482-84 (2001). It is extremely difficult to quantify Chinese emissions in large part because of lack of accurate records.
43. *See* Juliana Qiong Wang, *Environmental Briefing*, Sinosphere J., Nov. 2004, at 40, 41 (Coal currently accounts for 67.1% of total Chinese energy consumption and is predicted to remain its largest generator of energy for at least the next two decades.).
44. *See*, *e.g.*, *Section 129 Rules for Solid Waste Combustion*, *at* http://www.epa.gov/ttn/atw/129/gil2.html (last visited Mar. 26, 2005) (listing the Clean Air Act (CAA) regulations of mercury emissions due to solid waste combustion). See also the GLI, which establishes criteria for states to use when setting water quality standards for 29 pollutants, including bioaccumulative chemicals such as mercury. *See* http://www.epa.gov/ost/GLI/ (last visited Oct. 17, 2005).
45. *See* RTC, *supra* note 21.
46. *See id.* Vol. I.
47. *Id.* at 3-7.
48. *See* 65 Fed. Reg. at 79826.
49. 42 U.S.C. §7412(n)(1)(A).
50. 42 U.S.C. §7411. CAA §111(b) applies to new sources and CAA §111(d) applies to existing sources. *See id.* CAA §7411(b) & §7411(d). Under the final rule, an "affected source" constitutes the group of coal-fired units at a facility (a contiguous plant site where one or more SGUs are located). *See* Final Mercury Rule, *supra* note 1, at 30. The definition of "utility unit" mirrors the definition used in the Acid Rain and Clean Air Interstate Rule (CAIR) trading programs. *See id.* at 31.
51. *See* Final Mercury Rule, *supra* note 1.
52. *Id.* The cap-and-trade approach mirrors that of CAIR with respect to sulfur dioxide (SO_2) and nitrogen oxide (NO_x). *See generally* U.S. EPA, Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule (2002) (OAR 2003-0053) [hereinafter CAIR Rule].
53. *See* 42 U.S.C. §7651(b).
54. *See* Final Mercury Rule, *supra* note 1.
55. At least 14 states, 5 environmental groups, and 4 tribes petitioned EPA to reconsider the Final Mercury Rule. *See* U.S. EPA, *Controlling Power Plant Emissions: Decision Process and Chronology*, *at* http://www.epa.gov/mercury/control_emissions/decision.htm (last visited Sept. 10, 2005). At least 10 states have decided to file suit challenging the Final Mercury Rule. *See*, *e.g.*, Environmental News Network, *Wisconsin Joins States' Mercury Lawsuit Against EPA Mercury Rule*, *at* http://www.ens-newswire.com/ens/apr2005/2005-04-14-09.asp#anchor4 (last visited May 10, 2005) (announcing Wisconsin's decision to join nine northeastern states in bringing suit against EPA over the CAMR); Pennsylvania Department of Environmental Protection (DEP), *DEP to Challenge EPA's Mercury Reduction Rule*, *available at* http://www.dep.state.pa.us/newsreleases/default.asp?ID=3325&varQueryType=Detail (last visited Mar. 26, 2005) (stating DEP's intention to sue EPA for, inter alia, its failure to enact more stringent MACT-based regulations).
56. *See* Final Mercury Rule, *supra* note 1, at 16.
57. *Id.* at 22.
58. *See* 40 C.F.R. §60 (2005). The coal rank and process type subcategories are bituminous, subbituminous, lignite, coal refuse, and integrated gasification combined cycle (IGCC).

combustion units must implement best demonstrated control technology.[59] Compliance is measured over a 12-month rolling average basis, with compliance reports due semiannually.[60] For existing units under CAA §111(d), the rule does not set emission limits; instead, it creates "guidelines" and notes that existing sources are subject to the cap-and-trade regulations.[61] EPA stated that by 2010 to 2015, control technology capable of 90% to 95% mercury reduction will become commercially available.[62] However, according to EPA, mercury removal technology that is currently available cannot consistently attain the same results.[63] In part on this basis, EPA determined that a cap-and-trade approach is the best method of encouraging innovation of more effective control technologies.[64]

2. The Cap-and-Trade Regime

The operation and success of the cap-and-trade regime depends upon state participation and implementation of the CAMR guidelines.[65] EPA relies upon state implementation of the guidelines to ensure establishment of a uniform trading market and speed compliance with reduction requirements.[66] This system will function as intended only if it is based on accurate measurement and reporting of unit emissions and consistent allowance management procedures.[67] Thus, utilities and states must work together to implement a reliable, accurate measurement and management system.

States may elect to participate in an EPA-managed cap-and-trade program for SGUs greater than 25 MW.[68] To participate, a state must adopt the model cap-and-trade rules contained in the CAMR, but the state retains flexibility to modify sections regarding source mercury allocations.[69] For states that elect not to participate in an EPA-managed cap-and-trade program, their respective mercury budgets serve as a firm cap, and the states wield discretion regarding source mercury allocations.[70]

The CAMR cap-and-trade program relies upon the CAMR annual mercury allowances allocated by the states.[71] Mercury allowances are allocated to sources based upon the state's chosen allocation methodology. Each state bears the responsibility of deciding how to divide allowances between existing and future sources.[72] EPA's model mercury rule provides an example allocation that may be used by states or replaced by text that implements a state's alternative allocation methodology.[73] Sources are required to monitor and report their emissions.[74] Source information management, emissions data reporting, and allowance trading is done through on-line systems similar to those currently used for the acid rain sulfur dioxide (SO_2) and nitrogen oxide (NO_x) state implementation plan (SIP) call programs.[75] Any source found to have excess emissions must: (1) surrender allowances sufficient to offset the excess emissions, and (2) surrender allowances from the next control period equal to three times the excess emissions.[76] EPA states that a market system with a cap for mercury sources "provides the greatest certainty that a specific level of emissions will be attained and maintained because a predetermined level of reductions is ensured."[77] In sum, EPA concludes that cap-and-trade offers what MACT standards cannot—a definite, concrete reduction in emissions.

The next section provides a brief explanation of the structure of CAA §112 and the decision to delist SGUs.

B. The Section 112 Delisting

CAA §112 regulates the emissions of HAPs from "major sources."[78] Mercury and its compounds are listed as HAPs under CAA §112(b).[79] CAA §112(c) allows EPA to establish source categories and subcategories for regulation under CAA §112(d),[80] which requires EPA to establish emissions standards for major source categories and subcategories.[81] The relevant standard, which requires "the maximum degree of reduction of the [HAPs] subject to [CAA §112]," is extremely stringent and applies both to new and existing sources.[82] Because SGUs qualify as a major source under CAA §112(a) and emit mercury as a byproduct of coal combustion, they are subject to standards under CAA §112(d).

SGUs receive particular attention under CAA §112(n)(A), which directs EPA to conduct a study to evaluate what "hazards to public health [are] reasonably anticipated to occur" as the result of HAP emissions from utility units "after imposition of the requirements of th[e] Act," and to report the results of such study to Congress by No-

59. *See* Final Mercury Rule, *supra* note 1, at 43. EPA has determined that best demonstrated technology (BDT) for new sources is the use of effective particulate matter (PM) controls, e.g., fabric filter or electrostatic precipitator (ESP), and wet or dry flue gas desulphurization (FGD) systems on subbituminous-, lignite-, and coal refuse-fired units; effective PM controls, wet or dry FGD systems, and selective catalytic reduction (SCR) or non-SCR on bituminous-fired units; and activated carbon beds for IGCC units.

60. *See* Final Mercury Rule, *supra* note 1, at 28, codified at 40 C.F.R. §60.51 (2005).

61. *See id.* at 22-27.

62. *See id.* at 47.

63. EPA's success in reducing mercury emissions from solid waste incineration units under CAA §129 plainly contradicts its claim that current control technology cannot consistently reduce mercury emissions. *See* U.S. EPA, *Summaries of Related Solid Waste Incineration Rules*, *available at* http://www.epa.gov/oar/oaqps/takingtoxics/p3.html (last visited Oct. 2, 2005) ("The [§129 regulations] will reduce dioxin emissions by 99 percent and mercury emissions by 90 percent, compared with 1990 emissions levels from [municipal waste incineration units].").

64. *See* Final Mercury Rule, *supra* note 1, at 47.

65. *See id.* at 89.

66. *Id.*

67. *Id.*

68. *See id.* at 94.

69. *Id.*

70. *See id.*

71. *Id.*

72. *Id.*

73. *Id.* The actual example allowance is available at Final Mercury Rule, *supra* note 1, at 110.

74. *See* Final Mercury Rule, *supra* note 1, at 95.

75. *Id.*

76. *Id.*

77. *See id.* at 61.

78. *See generally* 42 U.S.C. §7412. CAA §112(a) defines "major sources" as "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 [HAPs]." *Id.*

79. *Id.*

80. *Id.* §7412(c).

81. *Id.* §7412(d)(1).

82. *Id.* §7412(d)(2).

vember 15, 1993.[83] Congress also directed EPA to describe in the RTC "alternative control strategies for [those] emissions that may warrant regulation under this section."[84] CAA §112(n)(1)(A) further provides that EPA shall regulate SGUs under CAA §112 if, considering the results of the study, the Administrator determines such regulation is "appropriate and necessary."

CAA §112(n) required EPA to study and submit an RTC on mercury emissions from SGUs[85] and tasked the National Institute of Environmental Health Sciences with determining the threshold level below which human exposure to mercury would not result in adverse health affects.[86] These provisions demonstrate congressional intent to better understand and stringently regulate mercury emissions from SGUs. They also conflict with EPA's decision to create a cap-and-trade mechanism.

In its 2000 regulatory finding, EPA determined that regulation of coal-fired SGUs was "necessary and appropriate" under CAA §112(n)(1)(A).[87] However, in the Preamble to the CAMR, EPA states that current data and evidence render its 2000 regulatory finding inaccurate.[88] EPA concludes that "[n]othing in [CAA §]112(n)(1)(A) suggests that Congress sought to preclude EPA from considering more current information in making the appropriate and necessary finding."[89]

The rescission of the 2000 regulatory finding is key to EPA's removing SGUs from the MACT requirements of CAA §112(d). The statutory language of CAA §112(d)(2) requires "the maximum degree of reduction in emissions of [mercury] (including a prohibition on such emissions, where achievable)."[90] The "maximum degree of reduction in emissions that is deemed achievable for new sources in a category or subcategory shall not be less stringent than the emission control that is achieved in practice by the best controlled similar source."[91] The cap-and-trade approach, however, makes no reference to "best controlled source." Rather, it allows utilities to decide who will reduce pollution first and bank emission allowances. By rescinding the 2000 finding, EPA removed mercury from regulations under the MACT standards and gave itself the authority to regulate SGUs through a trading regime under CAA §111.[92]

C. "Appropriate"

EPA relies on a narrow reading of CAA §112 to rescind its 2000 regulatory finding.[93] It faults the previous finding as overbroad to the extent it "hinged" on "environmental effects":[94]

> CAA §112(n)(1)(A) requires EPA to analyze only the "hazards to public health" resulting from utility HAP emissions, not the environmental effects caused by such emissions. Under CAA §112(n)(1)(A), the condition precedent for regulation under CAA §112 is public health hazards, not environmental effects, which Congress included in other provisions of CAA §112. *See, e.g.*, CAA §112(c)(3) ("a threat of adverse effect to human health or the environment").[95]

EPA concludes that the plain language of CAA §112(n)(1)(A) does not allow for the inclusion of environmental effects when evaluating the existence (or absence) of a public health hazard. Thus, EPA determines, its 2000 reliance on the potential environmental effects of mercury emissions was misguided and did not support an "appropriate finding."

EPA also criticizes the finding's failure to consider the extent of the mercury reductions that would result from the implementation of CAA §112 from the SO_x and NO_x emissions caps and from nonattainment provisions being imposed under §112.[96] On these bases, EPA asserts that regulation was not appropriate under CAA §112(n)(1)(A).[97]

EPA argues that the mercury levels remaining after the promulgation of the Clean Air Interstate Rule (CAIR)[98] and the CAMR, in tandem with existing CAA requirements, will not pose a public health hazard.[99] According to EPA, the SO_x and NO_x reduction requirements under CAIR will produce sufficient concomitant mercury reductions that the level of mercury pollution post-CAIR will not pose a "public health hazard" under CAA §112(d) and therefore does not trigger a necessary and appropriate finding. Moreover, EPA claims that the "CAMR, independent of CAIR, will result in levels of utility Mercury emissions that do not result in hazards to public health."[100] Thus, EPA concluded, the CAMR provides an independent basis for rescinding the necessary and appropriate finding because the utility mercury emissions after the CAMR-mandated move to CAA §111 will no longer pose a public health hazard.[101]

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83. *See id.* §7412(n)(1)(A).
84. *See id.*
85. *Id.* §7412(n)(1)(B). (The report was published in 1997.) *See* RTC, *supra* note 21.
86. 42 U.S.C. §7412(n)(1)(C).
87. 65 Fed. Reg. at 79825.
88. *See* Regulatory Revision, *supra* note 5.
89. *See id.* at 20. To support its conclusion, EPA cites *Chevron, U.S.A., Inc. v. Natural Resources Defense Council*, 467 U.S. 837, 14 ELR 20507 (1984). This rationale undercuts EPA's claim that it seeks to establish regulatory certainty since, by its own logic, EPA could continually revise its regulatory findings to reflect "current" information and data.
90. 42 U.S.C. §7412(d)(2).
91. *Id.* §7412(d)(3).
92. *See* Environmental News Network, *supra* note 55 and accompanying text. The legality of EPA's conclusions and actions remains the subject of heated debate and a number of lawsuits.
93. *See* Regulatory Revision, *supra* note 5, at 43-76.
94. *See id.* at 47.
95. *Id.*
96. *Id.* at 47-49.
97. *See id.* at 48-51. The December 2000 "appropriate" finding lacks foundation because EPA failed to fully account for the mercury emissions remaining after "imposition of the requirements of th[e] Act." *Id.* at 48 (citation omitted).
98. CAIR Rule, *supra* note 52; FRL-7885-9 (Mar. 10, 2005). CAIR represents the other major prong of EPA's recent efforts to address domestic pollutant emissions. EPA claims CAIR will permanently cap emissions of SO_2 and NO_x in the eastern United States. CAIR achieves large reductions of SO_2 and/or NO_x emissions across 28 eastern states and the District of Columbia. When fully implemented, CAIR will reduce SO_2 emissions in these states by over 70% and NO_x emissions by over 60% from 2003 levels. *See Clean Air Interstate Rule*, *available at* http://www.epa.gov/CAIR/index.html (last visited May 11, 2005).
99. *See* Regulatory Revision, *supra* note 5, at 54.
100. *Id.* at 56.
101. *See id.*

D. "Necessary"

In light of CAA §110(a)(2)(D) and §111, EPA determined that it should not have concluded in December 2000 that it "is necessary" to regulate SGUs under CAA §112 and therefore its finding was in error. The cap-and-trade regime under CAA §110(a)(2)(D) provides utilities with desired flexibility in pursuing least-cost compliance strategies,[102] which in turn allows utilities "to respond to changing electricity generation demands, economic market conditions or unanticipated weather situations (*e.g.*, extremely hot or cold periods) without jeopardizing their compliance status, or the stability of the overall cap."[103] Furthermore, EPA determined, under a cap-and-trade approach, that "[m]ost of the reductions are projected to result from larger units installing controls and selling excess allowances, due to economies of scale realized on the larger units versus the smaller units."[104] Finally, because of the technological innovation incentives inherent in a cap-and-trade regime, regulation under CAA §110(a)(2)(D) provides a superior alternative to regulation under CAA §112.[105] Because such an alternative exists, EPA determined that its previous finding was inaccurate.[106]

E. EPA and the CAMR's Global Awareness

The CAMR attempts to emphasize the global nature of mercury emissions. EPA states that in order to achieve reduction of nationwide mercury deposition and human exposure to mercury (particularly MeHg), the United States must be a leader in incentivizing global mercury reductions.[107] EPA cites the global nature of the mercury problem to justify the cap-and-trade regime.[108] The cap is said to act as a catalyst for innovation of emission control technology while trading provides utilities with the opportunity to allocate pollution credits efficiently according to market principles.[109] The development of control technology under this approach is projected to facilitate global mercury emissions reductions, ostensibly through technology transfers.[110]

EPA states that the mobile and toxic nature of mercury emissions requires a comprehensive, multilateral approach to reductions.[111] The relatively small U.S. contribution to the global cycle further emphasizes the need for multilateral reductions. To that end, EPA has collaborated with United Nations Environment Program (UNEP) to reduce emissions from developing countries.[112] EPA also seeks to accelerate the pace of UNEP mercury-related work. Thus, EPA implies, without a global effort to reduce emissions, the United States will not succeed in reducing domestic mercury deposition and exposure. There is, unfortunately, reason to doubt the sincerity of the current Administration in supporting this position.

IV. The Shortcomings of the Final Rule

This section highlights key shortcomings of the CAMR. This discussion does not endeavor to provide a comprehensive critique of the rule, nor does it focus on the more technical aspects of the regulation. Instead, it criticizes the policy rationales and phase-in timetables. Such criticism is more pertinent to the larger question of how best to address deposition in the United States of mercury pollution from non-U.S. sources, particularly China.

A. The Decision to Remove Mercury From Regulation Under MACT Standards

Mercury is a potent, hazardous neurotoxin.[113] As long as the 2000 "necessary and appropriate" finding stood, EPA had no choice but to establish a MACT standard when promulgating the CAMR. The decision to rescind the 2000 regulatory finding opened the door to establishing a cap-and-trade regime. In moving the regulation from the scope of CAA §112 to CAA §111, EPA relied on a flawed and overly narrow reading of the CAA.

CAA §112(n)(1)(A) lies at the center of EPA's decision to rescind the previous regulatory finding. EPA determined that environmental harm may not inform a "necessary and appropriate" finding. As justification, it cites the plain language of CAA §112(n)(1)(A).[114] However, this reasoning does not adequately consider mercury's ability to move through the environment and secondarily harm humans.[115] Because of mercury's ability to cycle from the atmosphere to water bodies and into fish, environmental hazards are intimately linked to human health hazards. Thus, in this case, adverse environmental effects translate into adverse public health effects. Given the toxicity of even trace amounts of mercury and the role that SGUs play in the quantity of mercury emissions, EPA should not have rescinded the "necessary and appropriate" finding.

Next, EPA faulted the 2000 finding for its failure to consider the effects that compliance with other provisions of the CAA would have on mercury emissions.[116] CAA §112(n)(1)(A) compels EPA to make the "necessary and appropriate" finding only after it makes reference to the level of HAP emissions remaining after "imposition of the requirements of th[e] Act."[117] EPA interprets the phrase "imposition of the requirements of th[e] Act" to include those requirements that EPA should have reasonably anticipated would be implemented and would result in reductions of utility HAP emissions.[118] Thus, EPA concluded that it

102. *See id.* at 58.

103. *See id.* at 59.

104. *See id.*

105. *See id.* at 61. The vague justification for this claim appears in the Preliminary Mercury Rule, where EPA stated: "Overly ambitious mercury mandates in the near-term could actually hamper innovation toward more effective and less costly technologies." U.S. EPA, Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam-Generating Units, 69 Fed. Reg. 4686-87 (Jan. 30, 2004).

106. *See id.*

107. *See* Mercury Final Rule, *supra* note 1, at 79.

108. *See id.*

109. *See id.*

110. *See id.*

111. *See* U.S. EPA Fact Sheet, *supra* note 2.

112. *See id.*

113. *See* Global Mercury Assessment, *supra* note 6, ¶ 6.

114. *See* Regulatory Revision, *supra* note 5, at 45-48.

115. EPA discounts the ability of mercury accumulation in the water and food chain as reasons for holding that environmental effects should have informed the 2000 finding.

116. *See* Regulatory Revision, *supra* note 5, at 48.

117. *See id.*

118. *See id.*

should have estimated mercury reductions likely to result from the implementation of nonattainment ozone reduction provisions under CAA Title I.[119] EPA also allegedly failed to consider two other major rules. The first rule set new source performance standards (NSPS) under CAA §111(b) for NO_x emitted from utility and industrial boilers. The second rule, promulgated under CAA §110(a)(2)(D), required 22 states and the District of Columbia to revise their SIPs to mitigate interstate transport of ozone.[120] Yet EPA does not provide an estimate of the projected reductions beyond 13 tpy associated with the nonattainment ozone reduction provisions.[121]

The problem with relying on concomitant reductions is simple. While potentially cost effective at least in the short term, this approach does not achieve maximum reduction. The control mechanisms are not optimized to capture mercury; they are optimized to capture SO_x and/or NO_x. Nonetheless, EPA argues that the remaining levels of mercury (after compliance with the rules and nonattainment provisions) will not pose a hazard, even though the hazards posed by mercury are significantly more severe than those posed by SO_x or NO_x. Throughout, EPA fails to emphasize just how much more toxic mercury is than SO_x and NO_x.[122] It also fails to recognize that perhaps it would be more protective of the public health, to optimize the control mechanisms for mercury.

EPA's conclusion that it should have relied on reductions stemming from rules that *had yet to be promulgated,* represent a criticism by the current administration of the previous administration for failing to accurately predict what might be done in the future to address mercury, SO_x, and NO_x.

B. The Inadequacy of Cap-and-Trade as a Means of Addressing Mercury

Cap-and-trade fails as a means of effectively addressing mercury emissions because mercury, unlike other tradable pollutants, is a HAP. While SO_x and NO_x pose health hazards, they do not rival mercury in their toxicity. Congress recognized that SGUs pose a potentially enormous risk to public health.[123] Creation of a cap-and-trade regime essentially discounts the widely held belief that *any* mercury exposure is toxic.[124] By EPA's own admission, utilities will be able to bank allowances; that is, they will be able to delay compliance.[125] Larger polluters will be free to purchase allowances from smaller polluters and delay implementing control technology. This solution, although market efficient from the perspective of the utility industry, virtually ensures that more pollution will remain in the air for longer periods of time. Yet, EPA still claims precisely the opposite will occur.[126] Furthermore, banking of allowances could lead to the creation of "hot spots," concentrated areas of pollution.[127] This is especially undesirable in light of mercury's toxicity, even at low levels.

The two stages of the cap-and-trade mechanism are fundamentally flawed. The first stage does not require any emission reductions beyond what is necessary to comply with CAIR; that is, power plants need not take any steps to reduce mercury emissions before 2018.[128] The Phase I cap envisions mercury reductions solely as a byproduct of compliance with CAIR NO_x and SO_x controls.[129] Any further reductions during Phase I would result from banking of allowances and early voluntary compliance. However, cap-and-trade is the most desirable solution because "reductions will be achieved with the least cost."[130] The 2018 Phase II cap is deficient for the same reasons: it leaves U.S. citizens waiting that much longer for cleaner air, water, and fish and greater protection of human health.[131]

C. The CAMR's Failure to Account for the Global Mercury Pool

EPA recognizes that U.S. SGUs contribute to the global mercury reservoir. However, EPA reasons that because U.S. SGUs account for less than 1% of global mercury emissions and significant amounts of MeHg come from the global pool, severely restricting mercury emissions from SGUs would not significantly curtail the MeHg health risk, would essentially force U.S. power plants out of business, and would fail to address the issue of the global pool.[132] In other words, EPA argues that mitigating the effect of global mercury emissions through U.S. regulation would produce minimal health benefits at extreme cost to utilities.[133]

The assertion that the inability of the United States to control the effects of the global mercury reservoir as a justification for not imposing stringent standards for mercury emissions is disconcerting. EPA's baseline assumption that economic cost should dictate whether the United States regulates SGU mercury emissions is irresponsible. As a global economic superpower, the United States has an obligation to urge other nations to reduce mercury emissions; in this

119. *See id.* at 51.

120. This assumes that total U.S. mercury emissions equal 146 tpy.

121. *See id.* at 52.

122. This was almost certainly intentional. A direct comparison of the toxicities of the three pollutants would lead a reasonable person to conclude that mercury poses the greatest risk and therefore should be aggressively controlled.

123. 42 U.S.C. §7412(n)(1)(A).

124. EPA's reference dose (RfD) for MeHg is 0.1 μg/kg bw/day, which is 0.1 micrograms of mercury per day for each kilogram of a person's body weight. *See* Regulatory Revision, *supra* note 5, at 16024. The RfD is believed to be the amount of mercury which, when ingested daily over a lifetime, is likely to be without an appreciable risk of deleterious effects to humans, including sensitive subpopulations such as fetuses. *See id.* EPA's RfD is more stringent than that of World Health Organization and Health Canada. *Id.* at 16025. Interestingly, EPA cites this comparison and then reminds the reader that the RfD is not a bright line and uncertainty remains as to what would happen if one exceeded the RfD. *See id.*

125. *See* Regulatory Revision, *supra* note 5, at 16027. EPA believes the cap-and-trade mechanism gives larger plants an immediate incentive to install control technology and thereby create more allowances.

126. "Most of the reductions are projected to result from larger units installing controls and selling excess allowances, due to economies of scale realized on the larger units versus the smaller units." *See* Regulatory Revision, *supra* note 5, at 16027. EPA relies on modeling and the Acid Rain Program to support its contentions. *See id.*

127. EPA believes that the CAMR will *eliminate* hotspots and that the likelihood of development of hotspots is remote. *See id.* at 16027-28.

128. *See* Final Mercury Rule, *supra* note 1, at 71.

129. *See id.* "A cap of 38 tons reflects the co-benefits level and is established as the [Phase I Cap]." *Id.* at 64.

130. *See id.* at 72. With a toxin like mercury, cost should not be the primary concern when promulgating environmental policy.

131. Reduction of U.S. anthropogenic mercury emissions will not necessarily correspond to an immediate reduction of mercury concentrations in the fish or the environment. *See* U.S. EPA FACT SHEET, *supra* note 2.

132. *See* Regulatory Revision, *supra* note 5, at 16029.

133. *See id.*

sense, the CAMR does not do nearly enough. EPA's cost-benefit concerns imply that until other nations aggressively address mercury emissions, the United States will not do so either.[134] On the basis of cost, EPA dismisses the need to consider the environmental and health effects of the global mercury reservoir when addressing MeHg in the United States, yet it repeatedly acknowledges the global nature of the problem.[135] Admittedly, EPA retains some discretion to decide which factors to consider when promulgating regulations.[136] But failing to regulate a substance as toxic as mercury effectively and aggressively would seem to be an abuse of discretion.

D. EPA's Efforts Reduce Global Mercury Emissions

EPA states that mercury emissions can only be addressed globally and proclaims its commitment to a multilateral solution in conjunction with UNEP.[137] The *2004 Report to UNEP*,[138] an example of U.S. enthusiasm for a multilateral solution, stated that it viewed funding of the UNEP Mercury Program as the most effective way of addressing transboundary mercury pollution.[139] The United States solicited UNEP's views on the potential need for a legally binding agreement or other nonbinding measures to reduce mercury pollution,[140] and stressed the importance of continuing the mercury program and additional identification of affected populations and areas. However, recent government statements and actions contradict the stated intent of cooperating with UNEP.

The U.S. government recently blocked a European Union-backed initiative to eventually ban the use of mercury.[141] Instead, the United States argued for the establishment of voluntary public-private partnerships aimed at increasing government-industry collaboration, raising public awareness of the dangers posed by mercury pollution, and increasing funding for studies of mercury's global effects.[142] The United States also blocked a French-German proposal to elevate UNEP to an agency-level organization, a move that would have increased UNEP's budget and powers, and would have drawn UNEP's operating funds from obligatory United Nations dues instead of from voluntary contributions.[143] The other UNEP Members acquiesced to U.S. demands.[144]

The U.S. government's actions do not square with EPA's stated commitment to work with UNEP to reduce mercury emissions as quickly as possible. First, voluntary partnerships allow UNEP countries to decide whether to work with industry to reduce mercury emissions. Governments could cite administrative costs as a barrier to creating such partnerships, and potential compliance costs could deter industries from working with local government to reduce mercury emissions. Second, the United States asked for further study of mercury's toxic effects, yet EPA has completed various studies that clearly establish mercury's effects on human health and the environment.[145] The additional studies will invariably take years to complete and delay potential solutions, thus contradicting EPA's claim that it is accelerating UNEP's mercury-related work.[146] Third, if the United States is genuinely committed to working with UNEP as its primary partner in reducing mercury emissions, it is unclear why it would oppose increasing UNEP's funding. These, among other policies and actions of the administration, provide reason to doubt its commitment to a multilateral framework to reduce global mercury emissions.[147]

In any event, in order to reduce emissions from other countries, and China in particular, the United States may have no option but to seek multilateral solutions.

E. Multilateral Efforts to Combat Mercury Emissions

The United States and EPA have taken some steps to develop and join a coordinated, multilateral effort to reduce mercury emissions. For example, the United States is a signatory to the Convention on Long-Range Transboundary Air Pollution (Convention),[148] whose Heavy Metals Protocol contains specific provisions on mercury emissions.[149] The Heavy Metals Protocol requires that signatories reduce their heavy metal emissions below 1990 levels (or an alternative year between 1985 and 1995).[150] The Heavy Metals Protocol aims to cut emissions from industrial sources, including electric power generators.[151] It lays down stringent limits on emissions from stationary sources and suggests best available techniques such as special filters or scrubbers for combustion sources or mercury-free processes.[152] Furthermore, the Convention explicitly provides for sharing of data[153] and promotes sharing of existing and proposed emissions reduction technology.[154] Thus, the Convention and the Heavy Metals Protocol provide an existing, comprehensive framework to which the United States belongs. However, EPA's decision not to consider the effects of the global mer-

134. MACT provides an example of aggressive action and one that EPA chose not to pursue.

135. *See* Regulatory Revision, *supra* note 5, at 16029.

136. *See id*.

137. *See id.* at 16028-29.

138. INPUT OF THE UNITED STATES TO THE UNEP REQUEST REGARDING INTERNATIONAL EFFORTS ON MERCURY AND OTHER HEAVY METALS FOR THE 23RD GOVERNING COUNCIL (2004), *available at* www.chem.unep.ch/mercury/GC-23-responses/GOV/US-Hg%20Comment%20to%20UNEP%202004.pdf (last visited Oct. 17, 2005). The United States provided $1.3 million to the UNEP Mercury Program in 2003 and 2004 and detailed an EPA atmospheric scientist with experience in mercury emissions. *See id.* at 1.

139. *See id.* at 2.

140. *See id.*

141. *See* Agence France Presse, *U.S. Blocks Talks on Mercury Ban*, *available at* http://www.terradaily.com/2005/050225145544.5vt0twu9.html (last visited Mar. 28, 2005).

142. *See id.*

143. *See id.*

144. *See id.*

145. *See*, *e.g.*, RTC, *supra* note 21; Final Mercury Rule, *supra* note 1.

146. *See* U.S. EPA FACT SHEET, *supra* note 2.

147. The recent experience in the United Nations in regards to garnering support for the Iraq Invasion provides another reason to question the U.S. commitment to a multilateral solution.

148. Convention on Long-Range Transboundary Air Pollution, Mar. 16, 1983, 34 U.S.T. 3043, [hereinafter LRTAP].

149. *See* Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Heavy Metals, June 24, 1998, U.N. Doc. E/ECE/EB.AIR/66/1999, U.N. Sales No. E.99.II.E.21 (1999), *available at* http://www.unece.org/env/lrtap/protocol/98hm.htm (last visited Mar. 29, 2005) [hereinafter Heavy Metals Protocol].

150. *See id.* art. 3, Annex I.

151. *See id.* Annex II.

152. *See id.* Annex III(I).

153. *See* LRTAP, *supra* note 148, art. 4.

154. *See id.* art. 7.

cury pool is inconsistent with the public stance of the U.S. government to cooperate with other nations to reduce mercury emissions.

On a fundamental level, the inconsistency between the stated international commitment of the United States and its substantive actions with respect to emission sources in the United States undermines its moral authority in the global community.[155] Moreover, this sends the implicit message that if the United States is not worried about mercury, other countries should not be either.[156] EPA's decision not to account for the effects of global mercury loadings when regulating mercury reflects a broader U.S. policy of rejecting global environmental initiatives.[157] This action also represents a lost opportunity to place EPA's efforts within a larger framework. Cross-border cooperation is not only good diplomacy, it offers opportunities for reducing transaction costs, supports sharing of data and technology, allows countries to harmonize control and enforcement efforts, and provides policy that is informed by insight and experience from regulators in other countries. The CAMR's failure to account for global loading is thus a failure on many fronts, not the least of which is protection of human health and the environment.

V. China

China's mercury emissions are directly linked to its heavy reliance on coal as an energy source. Coal currently accounts for 67.1% of total Chinese energy consumption, and in light of China's ambition to quadruple the size of its economy by 2020,[158] coal is unlikely to lose its place as the primary source of energy.[159] Heavy, energy-intensive industries are forecast to constitute at least 50% of the projected growth, and residential demand for commercial energy is also predicted to increase substantially.[160] By 2020, China's gross energy consumption is estimated to reach three billion metric tpy of coal equivalents, double its current energy production capacity.[161] China's economic ambitions and energy realities translate into an unavoidable conflict between prosperity and the environment, as increased reliance on coal will certainly increase China's mercury emissions.

This section explains the current regulatory structure and Chinese air pollution regulation, highlights some of the regulatory challenges facing China, and proposes a means of simultaneously reducing pollution, protecting health, and sustaining economic growth.

A. The Chinese Environmental Regulatory Framework

The State Environmental Protection Agency (SEPA) is the administrative body in the Chinese government responsible for environmental protection.[162] Its major responsibilities include formulating and organizing the implementation of laws, rules, and regulations on the prevention of air pollution, and organizing national compliance inspection and enforcement.[163] SEPA and its local units are charged with supervisory authority and have the right to inspect any enterprise without a warrant or notice.[164] In theory, this system gives authorities the necessary tools and power to ensure compliance with air pollution laws. As the next section illustrates, theory and reality are two very distinct concepts in Chinese environmental enforcement.

B. Current Chinese Air Pollution Regulation

Current Chinese air pollution regulations only indirectly control coal-related mercury pollution.[165] The relevant law, The Law of the People's Republic of China on the Prevention and Control of Air Pollution (Air Pollution Law), has a stated purpose of support for clean, efficient technology,[166] endeavors to prevent and control air pollution,[167] directly regulates air pollution caused by coal burning,[168] and contains provisions establishing legal liability for illegal emission of pollutants.[169] However, the law suffers from two significant deficiencies.

First, although companies that release pollutants into the atmosphere are required to report the character and volume of the pollutants, they may opt out of compliance with local or national standards through payment of a discharge fee.[170] If the cost of compliance is greater than the cost of the fee, simple economics dictate that companies will opt for the latter and emit without installing control technology. At least one coal-fired utility has availed itself of this loophole, and others are likely to do the same.[171]

Second, the law addresses coal-related SO_2 and acid rain concerns, but does not address mercury.[172] Although the law contains a section devoted solely to coal combustion-related emissions, it does not regulate coal's most pernicious by-

155. The current Administration certainly does not concern itself with the opinion of other countries in regards to domestic environmental policy. This position fails to recognize that cross-boundary cooperation is required where transboundary pollution is concerned.

156. But for the creative legal interpretations needed to move SGUs from under CAA §112 to §111, the CAMR might have seemed a bold move to control SGU mercury emissions; however, the decision to cap-and-trade mercury instead of seeking a MACT standard undercuts the argument that EPA is doing everything possible, and especially so when one considers that *cost*, not health, plays the deciding role.

157. The rejection of the Kyoto Protocol is one example.

158. *See* Wang, *supra* note 43, at 41.

159. *See id.*

160. *See* Dai Yande et al., *China's Energy Demand Scenarios to 2020*, SINOSPHERE J., May 2004, at 7.

161. *See* Wang, *supra* note 43, at 41; *Invisible Export*, *supra* note 9.

162. U.N. Environment Programme China Office, *China's Environmental Administration System*, *available at* http://www.zhb.gov.cn/english/China-Office/institutions.htm (last visited May 9, 2005).

163. *Id*.

164. James M. Zimmerman Esq., CHINA LAW DESKBOOK 755 (2d ed. 2005) [hereinafter CHINA LAW].

165. Law of the People's Republic of China on the Prevention and Control of Air Pollution, Chapter III (amended and approved on April 29, 2000, by the 15th Standing Comm. of the 9th Nat'l People's Congress, *reprinted in* CHINA LAWS FOR FOREIGN BUSINESS (CCH), Business Regulation ¶ 14-720 [hereinafter Air Pollution Law].

166. *See id.* ch. I.

167. *See id.* ch. II.

168. *See id.* ch. III.

169. *See id.*

170. *See* Air Pollution Law, *supra* note 165, arts. 12-14; Environmental Protection Law of the People's Republic of China, art. 28 (adopted on Dec. 26, 1989, at the 11th Sess. of the Standing Comm. of the 7th Nat'l People's Congress), *reprinted in* CHINA LAW FOR FOREIGN BUSINESS (CCH), Business Regulation ¶ 14-530 [hereinafter Environmental Protection Law]; CHINA LAW, *supra* note 164, at 761.

171. *See Invisible Export*, *supra* note 9.

172. *See* Air Pollution Law, *supra* note 165, ch. III.

product.[173] The law controls mercury only as a secondary effect of controlling SO_2 emissions. The failure to regulate mercury and the existence of the discharge fee opt-out seriously challenge the Air Pollution Law's ability to control mercury and other air pollutant emissions at a time when such emissions should concern the Chinese government.

C. Not on the Radar, Yet

Mercury does not appear to be recognized as a principal environmental or health concern for Chinese authorities or businessmen.[174] The Air Pollution Law is silent on mercury emissions,[175] and a government scientist was been quoted in 2004 as saying that coal-related air pollutants will not pose much of a problem in the near future.[176] Fortunately, installation of SO_2 controls results in at least a minor reduction of mercury emissions. Thus, by regulating SO_2, China should also reduce mercury emissions, even if such reductions will be wholly coincidental and secondary. In the absence of government and business determination to directly confront coal-related mercury emissions, it is unlikely that there will be significant mercury emissions abatement in China.

The problem is not confined to the boom of coal-fired utility plants; it also extends to the residential sector. Many urban Chinese households use coal stoves for cooking or space heating, and most centralized heating is provided by small coal-fired boilers located in residential or business districts.[177] Although China has implemented nationwide energy conservation programs since the early 1980s, small furnaces and kilns generally lack emissions controls.[178] The sheer number of such furnaces and kilns represents a very large residential demand for coal, resulting in a huge source of airborne mercury pollution outside the scope of extent regulation, and widespread low-level mercury exposure in the home.

Despite these facially negative situations, there is hope for improvement and abatement of coal-related mercury emissions. First, SEPA has listed mercury and mercury compounds as prohibited or strictly controlled hazardous chemicals.[179] Second, China has focused more attention and money on environmental protection and enforcement. Third, SEPA is working toward reducing local favoritism, protectionism, and corruption, which contribute to many environmental problems.[180] Fourth, in response to the problem of emissions from unregulated coal-fired heaters in residences, SEPA has established standards for the levels of smoke and dust that can be discharged from coal-fired boilers. Noncompliant boilers are banned from manufacture, sale, or import.[181] Lastly, emphasis also has been placed on solutions such as requiring the use of cleaner, more efficient technology.[182] Thus, China appears to be working toward phasing out dirtier coal-fired technology while strengthening existing enforcement mechanisms.

Outside of the enforcement sphere, nongovernmental organizations (NGOs) and the Chinese government are working jointly to increase public awareness of the dangers posed by airborne mercury pollution. One such organization, Global Village Beijing, organized a conference to discuss current problems relating to mercury pollution and how best to educate the public as to the effects of mercury emissions.[183] The government also has sponsored conferences on environmental protection, the effects of pollution, and remediation measures.[184] The initiatives of both NGOs and the government are heartening in that they express a desire to further develop means of addressing existing pollution issues; yet mercury still receives too little specialized attention. Unlike the United States, China lacks regulation directly limiting mercury emissions from coal-fired utilities and the chlor-alkali industry.

The one-party, top-down structure of China creates a unique opportunity to promulgate and enforce uniform, nationwide mercury emissions standards. While the party bureaucracy could prove slow to act to adopt strict standards, administrative fiat could effectively force compliance. The question remains how to convince China that regulating mercury emissions should be a priority. The onus falls on developed countries to provide incentives to entice China to move away from cheap and plentiful, but dirty, coal power.

D. Proposed Solutions for China

A variety of options may be available to China to reduce and/or regulate mercury emissions. It has already (perhaps unintentionally) taken an important first step toward dealing with airborne mercury pollution by the promulgation of standards for residential and industrial coal-fired boilers.[185] It is unlikely that China will move away from coal as a source of energy in the near future; therefore, any comprehensive solution must include a variety of control methods, including clean coal, end-of-pipe mechanisms, and more efficient technologies. Existing control technologies that reduce SO_x, NO_x, and particulate matter for coal-fired boilers and incinerators yield some level of mercury control.[186] Thus, at a bare minimum, China should strengthen its SO_2 and NO_x control regimes.

The ideal mercury reduction strategy would require installation of secondary emissions control mechanisms and the imposition of a technology-based standard. China's enormous consumption of coal and its world-leading mer-

173. *See id*.

174. *See Invisible Export*, *supra* note 9.

175. *See* Air Pollution Law, *supra* note 165, ch. III (stating the aim of reducing SO_2 emissions through implementation of control technology).

176. *See Invisible Export*, *supra* note 9.

177. The World Bank, Clear Water, Blue Skies: China's Environment in the New Century 46 (1997).

178. *Id.* at 47.

179. SEPA, Catalogue of Toxic Chemicals Prohibited or Strictly Controlled (First Batch) (Nov. 15, 2002), *available at* http://www.zhb.gov.cn/eic/650495276838027264/20021115/1035174.shtml (last visited Oct. 17, 2005).

180. *See* China Law, *supra* note 164, at 755.

181. *See* Air Pollution Law, *supra* note 165, arts. 28-31, 38.

182. *Id.* art. 11 (obligating businesses to use more energy-efficient, less-polluting technology).

183. *See Mercury Campaign*, *available at* http://www.gvbchina.org/EnglishWeb/MercuryCampaign.htm (last visited Mar. 20, 2005).

184. *See, e.g.*, *2004 China International Environmental Protection Fair*, *at* http://www.sinoexhibition.com/net/englishgj.htm (describing the achievements in the field of environmental protection during "the National Tenth Five-Year Plan" and promoting the international exchange and cooperation in the field of environmental protection technology).

185. *See* Air Pollution Law, *supra* note 165, arts. 28-31, 38.

186. *See* Global Mercury Assessment, *supra* note 6, ¶ 122.

cury emissions justify strict regulation of a potent neurotoxin such as mercury. Improving control methods has the potential to be the best vehicle for maximum reduction of mercury emissions. However, mercury removal efficiency depends upon a number of variables, particularly the type of coal used and the removal method.[187] The ideal regulation would allow businesses leeway to choose control methods depending on the combustion mechanism and the coal type. But, regulation also would need to ensure that industry does not opt for the least-efficient control method on the sole basis of cost. To achieve maximum reductions of mercury emissions, demonstrated emissions reduction capability, not cost, should play the central role when selecting control technology. In this sense, a "cost-blind" technology-based standard would be ideal, and China could rely on its one-party structure to achieve compliance from industry.

If China were to make good on its expressed intent to rely on clean coal, it could also realize a considerable reduction of coal-based mercury emissions.[188] Less capital-intensive means of reducing mercury emissions include improved energy efficiency and decreased energy consumption and/or energy conservation. China has already voiced support for these last two initiatives and has required enterprises to give priority to efficient energy use.[189] Although there may be no current means of ensuring zero mercury emissions, China should move quickly to reduce mercury emissions as quickly and efficiently as possible, through implementation of a mercury emissions control regime.

The Chinese government's declared intent to construct a "well-off society" by 2020 forecasts an explosion in demand for energy in the near future.[190] Because industry will have pressures to meet its needs in the most cost-effective manner, coal is the obvious energy source.[191] Therefore, any emissions control proposal must acknowledge that the growing Chinese economy will likely overpower the effect of any one mercury pollution reduction measure. Accordingly, requirements for greater energy efficiency must be accompanied by a mercury control regime. Notwithstanding its likely reliance on coal, technological improvements, globalization, and the entrance of China into the World Trade Organization (WTO) should afford China the opportunity to realize rapid economic development with lower rates of energy consumption.[192]

The next section examines the challenges facing China and the United States, explains the need for cooperation between the two countries, and explores means of developing a coordinated global mercury emissions reduction policy.

VI. China and the United States

EPA is correct that mercury emissions must be reduced globally in order to achieve maximum reduction in deposition within the United States. Because China is the world's largest emitter of mercury, with emissions carried by prevailing wind currents over the Pacific Ocean, the United States has a strong interest in Chinese mercury emissions. China's growing economy, however, does not make it likely that absent foreign intervention, China's mercury air emissions will decrease. This section begins by proposing the need of U.S. assistance to China in confronting its environmental challenges as a prelude to establishing a relationship with China with the objective of effectively reducing mercury air emissions.

The GLI provides a successful example of binational cooperation, technology development, and pollution abatement. The establishment of such a relationship between China and the United States would provide economic incentives for industry and create opportunities. Perhaps more importantly, a mercury partnership between China and the United States would demonstrate the sincerity and commitment of both countries to addressing the global nature of mercury pollution.

A. China's Enforcement Challenges

China's enforcement mechanisms, while facially stringent, are effectively lax. Whether for economic, political, or other reasons (including corruption),[193] the Chinese government has yet to uniformly enforce its environmental regulations. While recent enforcement efforts show signs of improvement,[194] China still faces a long road. Where mercury is concerned, China's failure to act translates into more MeHg in the United States. Thus, the CAMR's failure to consider global loading ignores the possibility that the environmental policies of other countries, particularly China, might impede the CAMR's objective of clear air in the United States.

The next section proposes a framework within which China and the United States can jointly address this and other challenges related to mercury pollution.

B. Bilateral Cooperation: The GLI Binational Toxics Strategy as a Model

The United States has experience with bilateral pollution abatement relationships with foreign sovereigns. For example, the GLI of Canada and the United States emerged in the early 1990s from the recognition that despite significant progress under conventional rule-based regulation in reducing gross pollutant inputs, including mercury, the ecosystems of lakes remained badly degraded.[195] Both govern-

187. *See id.* ("It must be remembered that the characteristics of the raw material, the combustion process (or other high temperature process), and the specifications of the control equipment all influence the eventual emissions of mercury from the exhaust generated by a given plant.").

188. *See* Global Mercury Assessment, *supra* note 6, ¶ 659 ("If coal cleaning is carried out prior to combustion… typically 10% to 50% of the mercury in coal can be removed [ ] in the cleaning process.").

189. *See* Air Pollution Law, *supra* note 165, art. 19.

190. *See* Yande et al., *supra* note 160, at 7.

191. *See Invisible Export*, *supra* note 9 ("With current global reserves, it probably wouldn't be a stretch to keep using coal another 200 years."). *See also* Yande et al., *supra* note 160, at 7 ("Regardless of whether China succeeds in decreasing its reliance on coal through increased implementation of renewable and other "clean" energy sources, coal is predicted to remain its largest generator of energy for at least the next two decades.").

192. *See* Yande et al., *supra* note 160, at 13.

193. Susmita Dasgupta et al., Bending the Rules: Discretionary Pollution Control in China (World Bank Policy Research, Working Paper No. 1761, 1997).

194. China Law, *supra* note 164, at 755. The agency recently demonstrated its commitment to stronger enforcement when it suspended several multibillion-dollar power projects for failing to comply with environmental impact assessment procedures. *See Cleaner Environment as Important as Growth*, *at* http://www.china.org.cn/english/environment/123193.htm (last visited Mar. 22, 2005).

195. Bradley Karkkainen, *Marine Ecosystem Management and a "Post-Sovereign" Transboundary Governance*, 6 San Diego Int'l L.J. 113, 130 (2004).

ments concluded that cross-border cooperation was required to effectively address the problem of contamination of the lakes. Through the GLI, Canada and the United States have established a top-to-bottom cooperative relationship which includes agencies of all levels of government in each nation—U.S. states, Canadian provinces, and local municipalities—as well as representatives of business and independent scientific communities.[196]

The GLI relies on a "nested structure" devising strategies and coordinating efforts at multiple levels.[197] Cooperation on a general level occurs through conferences on topics such as toxic chemical strategies and joint reassessment of progress, goals and implementation measures.[198] At an intermediate level, binational collaboration occurs among federal, state, and provincial officials. At the local level, remedial action plans are developed for designated areas of concern.[199] At the root of all cooperation is a common core of shared information and data.[200]

The GLI addresses mercury through the Binational Toxics Strategy (BTS). Signed in 1997, the BTS seeks percentage reductions in targeted persistent toxic substances (including mercury) so as to protect and ensure the health and integrity of the Great Lakes ecosystem.[201] In particular, the BTS is designed to ensure the virtual elimination of persistent toxic substances, such as mercury, in the lakes.[202] Workgroups are the backbone of the BTS and are formed to address specific challenges or substances.[203] They engage in information-gathering, fact-finding, and information-exchange and formulate ideas, suggestions, and options for reductions.[204] Workgroups present their findings and suggestions to interested parties, including representatives of governmental bodies, states, provinces and local communities, tribal governments, industry, and academia.[205] Furthermore, workgroups encourage participation by these same stakeholders.[206] The transparent, nonhierarchical nature of the workgroups is conducive to an efficient exchange of information, ideas, and technology.[207] Contributing to the success of the GLI is the virtual absence of cultural and geographical barriers between Canada and the United States, and a shared commitment to, and interest in, the health of the Great Lakes.

Admittedly, the BTS model is not without its flaws. First, it only regulates point sources.[208] Second, although GLI sets a mercury emissions limit, many state national pollutant discharge elimination system (NPDES) permits allow U.S. facilities in the Great Lakes Basin to discharge mercury at levels greater than the GLI water quality standard.[209] Third, GLI (and BTS in particular) is vulnerable to the administrative and bureaucratic shortcomings of the participating governments.[210]

The BTS model provides a framework within which China and the United States could work jointly toward better understanding and reducing the effects of mercury pollution. Furthermore, by encouraging participation from all interested parties, the working group model potentially affords participating companies exposure to the Chinese market.

China's growing energy demand translates into a growing need for mercury pollution control. Technology transfers from U.S. companies would improve air quality and lessen health and environmental impacts in both China and the United States, as well as provide economic benefits to both countries, creating an attractive and mutually beneficial relationship. The working group could also serve as a forum for U.S. representatives to promote action by SEPA to enforce environmental laws. However, unless the United States demonstrates that it is willing to seriously address mercury sources within its borders, any efforts to persuade other nations, including China, to reduce mercury emissions will ring hollow. In order to mitigate mercury loadings from China, EPA must rethink mercury regulation, including the CAMR, to account for global mercury loadings through aggressive standards and then to act to control U.S. emission sources more aggressively to achieve maximum control.

VII. Conclusion

The global nature of mercury emissions requires a comprehensive, global solution. The existence of global sources of mercury does not absolve EPA of the responsibility to ensure that U.S. sources are stringently controlled in order to protect public health. Rather, it requires EPA to account for global loading when promulgating caps and standards. In a larger context, both EPA and the Bush Administration must sincerely commit to cooperating with other governments and regulatory agencies in order to reduce mercury emissions. It is inefficient, disingenuous, and dangerous for EPA and the Administration to claim that mercury requires a global solution and then undercut multilateral efforts to address mercury emissions. The net result of this policy is increased mercury levels in the United States from sources in both China and the United States.

The insincerity of the Administration and EPA efforts to regulate mercury globally is reflected in the CAMR, which fails to place health ahead of economics. Although the decision to create a cap-and-trade program for emissions from SGUs potentially will reduce mercury emissions from coal utilities while also protecting economic growth and stability, creation of a trading mechanism for hazardous and po-

196. *Id.* at 131.

197. *See id.* at 132.

198. *See id.*

199. *See id.*

200. *Id.*

201. U.S. EPA, *Implementing the Binational Toxics Strategy*, *at* http://www.epa.gov/glnpo/bnsdocs/implplan.html (last visited Sept. 11, 2005).

202. U.S. EPA, *Great Lakes Binational Toxics Strategy—Introduction*, *at* http://www.epa.gov/glnpo/p2/bnsintro.html (last visited Sept. 11, 2005).

203. *Implementing the Binational Toxics Strategy*, *supra* note 201.

204. *Id.*

205. *Id.*

206. *Id.*

207. *See id.*

208. U.S. Government Accountability Organization (GAO), EPA Needs to Better Ensure the Complete and Consistent Implementation of Water Quality Standards 14 (2005) (GAO-05-829), *available at* http://www.gao.gov/new.items/d05829.pdf (last visited Sept. 11, 2005). "Flexible implementation procedures such as variances are widely used to allow dischargers to exceed the strict GLI mercury water quality standard of 1.3 nanograms per liter of water (ng/*l*)." *Id.* at 18.

209. *Id.*

210. *See id.* at 30. EPA's delayed introduction of toxics information clearinghouse limited the development of consistent water quality standards.

tent neurotoxins is not good policy. Moreover, a cap-and-trade program provides the largest polluters with an incentive to bank allowances and delay compliance with impending caps. It also invites the creation of mercury hot spots and allows larger amounts of mercury to be emitted for longer periods of time. Given the toxic effects of mercury, EPA should reduce mercury emissions to as low a level as possible. A cost-blind technology-based standard is far more appropriate for achieving this goal.

EPA's reasoning in the delisting of SGUs from the MACT program is tenuous and primarily rests on an overly narrow reading of CAA §112(n)(1)(A). This decision to regulate coal SGUs under an emissions trading program rather than a MACT standard is the most controversial portion of the CAMR, and subject to ongoing litigation. Whether the rule survives remains to be seen.[211]

In the meantime, EPA faces the distinct possibility that any reductions achieved under the CAMR may be offset by China's economic plans and energy needs, both of which spell an increase in mercury emissions. Therefore, the United States should work with China to bilaterally reduce mercury emissions. Joint action through workgroups would provide an opportunity to share costs, data, and technology while involving interested parties such as government, regulators, industry, and citizens.

China, for its part, must enforce existing laws and continue to improve enforcement efforts. If new coal-fired SGUs complied with the Air Pollution Law by using more fuel-efficient, lower pollution-producing technologies, mercury emissions would almost certainly decrease. In a similar vein, China must demonstrate that its commitment to the use of clean-coal technology whenever and wherever possible is more than empty speech. Perhaps most importantly, China must remove the loophole that permits utility plants to emit pollutants in excess of local and national standards. The pay-to-pollute option directly undermines the Air Pollution Law and renders any future reduction of air pollutants—whether SO_x, NO_x, or mercury—highly unlikely.

On a brighter note, recent demonstrations suggest that the Chinese citizenry may have become impatient with lax environmental enforcement.[212] Should public sentiment against disregard for environmental controls continue, the Chinese government may have no choice but to enforce its existing laws and perhaps to enact new ones. However, there is no guarantee that public sentiment can sway political or legal decisions. Therefore, the real question is whether the Chinese authorities are committed to enforcing environmental law even if it slows economic growth.

211. In response to numerous petitions, see *supra* note 55, EPA agreed to reconsider portions of the CAMR on June 25, 2005. *See* U.S. EPA, *Chronology of Actions to Date*, *at* http://www.epa.gov/mercury/control_emissions/decision.htm#June (last visited Oct. 2, 2005). The particular sections to be reconsidered will be listed in a future *Federal Register* notice. *Id.* In the meantime, the CAMR remains under legal challenge from numerous states and public interest groups. *See supra* note 55.

212. *See* Edward Cody, *China's Rising Tide of Protest Sweeping Up Party Officials*, Wash. Post, Sept. 12, 2005, at A1 (with tacit support from local party officials, villagers in numerous rural communities tore down mining facilities responsible for fouling local rivers); Jim Yardley, *Thousands of Chinese Villagers Protest Factory Pollution*, N.Y. Times, Apr. 13, 2005, at A3 ("Local villagers [protested] after, they say, trying in vain for two years to curb pollution from chemical plants in a nearby industrial park."). *Id*.