



**REDUCING ATMOSPHERIC LEAD EMISSIONS FROM STATIONARY POINT SOURCES IN CHINA:
LOOKING AT U.S. REGULATORY HISTORY TO INFORM CHINESE POLICYMAKERS**

Houmi Huang & Jim Smith

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I. INTRODUCTION

China has experienced a rash of mass lead poisoning incidents in the past decade due to atmospheric lead emissions from metals processing plants. These incidents are caused by factories that violate the law. This paper focuses on bringing these factories that emit lead into compliance with China's environmental law. Although government abatement of exposure to "in-place" lead¹ is without a doubt an important topic and something that many countries continue to grapple with, we will not be addressing it here. Continuing industrial lead emissions, "in contrast to those from 'in-place' lead, are amenable to regulatory control."²

Since the United States and China banned the use of leaded gasoline in road vehicles in 1996 and 2000, respectively, the major sources of atmospheric lead emissions are the primary and secondary metals processing industries and lead-acid battery plants.³ Primary metals processing factories smelt ore to obtain refined metals.⁴ The primary copper, lead, and zinc

¹ "In-place lead" is lead that has previously been deposited.

² U.S. Environmental Protection Agency Strategy for Reducing Lead Exposures, 22 (Feb. 21, 1991) *available at* <http://www.epa.gov/ttnnaqs/standards/pb/data/leadstrategy1991.pdf>.

³ *E.g.* Yael Calhoun, Environmental Issues–Air Quality, 24 (2005) ("Due to the phase out of leaded gasoline, metals processing is the major source of lead emissions to the air today. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers."); Barry Leonard, Latest Findings on National Air Quality: 2001 Status and Trends, EPA 454/K-02-001, 15 (Sept. 2002) ("In the past, automotive sources were the major contributor of lead emissions to the atmosphere. As a result of EPA's regulatory efforts to reduce the content of lead in gasoline, however, the contribution of air emissions of lead from the transportation sector, and particularly the automotive sector, has greatly declined over the past two decades. Today, industrial processes, primarily metals processing, are the major source of lead emissions to the atmosphere. The highest air concentrations of lead are usually found in the vicinity of smelters and battery manufacturers."); Lead Battery Background, OCCUPATIONAL KNOWLEDGE INTERNATIONAL, <http://www.okinternational.org/lead-batteries/Background> ("Lead battery manufacturing and recycling are now the most significant source of lead exposures throughout the world.").

⁴ NAICS 331: Primary Metal Manufacturing, U.S. Census Bureau, *available at* <http://www.census.gov/epcd/ec97/def/331.HTM> ("Industries in the Primary Metal Manufacturing subsector smelt and/or refine ferrous and nonferrous metals from ore, pig or scrap, using electrometallurgical and other process metallurgical techniques.").

smelting industries in particular produce large amounts of harmful atmospheric lead emissions.⁵ Secondary metals processing factories extract ferrous metals (those containing iron) and nonferrous metals (those not containing iron) from scrap materials for reuse in other goods.⁶ Operations in this category that contribute significant atmospheric lead emissions are secondary lead processors, which includes battery recycling plants, and copper and aluminum smelters.⁷ Factories that manufacture lead-acid batteries are also responsible for atmospheric lead emissions.⁸

The mistakes the US has made and its successes in regulating atmospheric lead emissions from stationary point sources should inform the Chinese debate about how to craft legislation and carry out policies to eliminate mass lead poisoning events.

II. WHY STRINGENT REGULATIONS AND STRICT ENFORCEMENT ARE IMPORTANT

A. Detrimental Health Effects of Lead Exposure Amplified Near Polluting Factories

The harmful effects of lead on human health are well-documented.⁹ Adults with elevated blood lead levels face a heightened risk of increased blood pressure, heart disease, and decreased kidney function.¹⁰ Children are particularly vulnerable to the negative effects of lead. “[B]ecause of their immaturity, [children] are most susceptible to systemic and neurological injury, including lowered IQs, reading and learning disabilities, impaired hearing, reduced

⁵ Locating and Estimating Air Emissions From Sources of Lead and Lead Compounds, EPA-454/R-98-006 (stating lead emitted into the air during primary (4-5) lead smelting, primary (4-27) copper smelting, and primary (4-44) zinc smelting).

⁶ NAICS 331: Primary Metal Manufacturing, *supra* note 4.

⁷ Locating and Estimating Air Emissions From Sources of Lead and Lead Compounds, EPA-454/R-98-006 (stating lead emitted into the air during secondary (4-20) lead smelting, secondary (4-36) copper smelting, and secondary (4-50) aluminum smelting).

⁸ Emission Estimation Technique Manual for Lead-Acid Battery Manufacturing, National Pollutant Inventory, 4 (1999) available at <http://www.npi.gov.au/publications/emission-estimation-technique/pubs/fbattac.pdf> (“The most likely listed substances to be emitted from the lead-acid battery manufacturing process are particulate matter (PM₁₀), lead, sulfuric acid and some trace metals.”).

⁹ Fact Sheet – Final Revisions to the National Ambient Air Quality Standards for Lead, available at <http://epa.gov/air/lead/pdfs/20081015pbfactsheet.pdf> (“More than 6,000 new studies on lead health effects, environmental effects and lead in the air have been published since 1990.”).

¹⁰ *Id.*

attention span, hyperactivity, behavioral problems and interference with growth.”¹¹ Even extremely low blood lead levels may be toxic.¹² In the United States, an estimated half a million children have blood lead levels above 5 µg/dL, the recently-revised standard for lead poisoning according to the Centers for Disease Control and Prevention.¹³

Exposure to lead emissions can occur through inhalation and ingestion. “When inhaled, approximately 20 to 50% of the lead is retained in the body.”¹⁴ “Ingestion of lead that has settled onto surfaces is the main route of human exposure to lead originally released into the air.”¹⁵ In general, people living near stationary point sources face a heightened risk of lead poisoning by virtue of their proximity to the emissions.¹⁶ In these neighborhoods, atmospheric lead concentrations are especially high, particularly if the polluting factory lacks effective pollution controls.¹⁷ Certain climatic conditions, like aridity, low wind velocity, and thermal inversions, can also amplify atmospheric lead concentrations in the areas surrounding the polluting factories.¹⁸

B. Industry Growth

China’s metals processing and lead-acid battery manufacturing industries have experienced enormous growth in recent years, and all signs point to continued growth in the

¹¹ Jamie Lincoln Kitman, *The Secret History of Lead*, THE NATION (Mar. 2, 2000) available at <http://www.thenation.com/print/article/secret-history-lead>.

¹² Fact Sheet – Final Revisions to the National Ambient Air Quality Standards for Lead, *supra* note 9 (“There is no known safe level of lead in the body . . . [N]ew studies show that health effects occur even at very low blood lead levels.”).

¹³ Lead, Centers for Disease Control and Prevention, <http://www.cdc.gov/nceh/lead/>.

¹⁴ Arnold W. Reitze, Jr., Stationary Source Air Pollution Law, 29 (2005).

¹⁵ Fact Sheet – Final Revisions to the National Ambient Air Quality Standards for Lead, *supra* note 9.

¹⁶ Philip J. Landrigan and Edward L. Baker, Exposure of Children to Heavy Metals from Smelters: Epidemiology and Toxic Consequences, 25 ENVIRONMENTAL RESEARCH 204, 205 (1981) (discussing how “smelter emissions represent a serious threat to public health” and the “exaggerated conditions of exposure near smelting plants”).

¹⁷ Qian Li, Hongguang Cheng, Tan Zhou, Chunye Lin, Shu Guo, The estimated atmospheric lead emissions in China, 1990-2009, 60 ATMOSPHERIC ENVIRONMENT 1, 6 (Dec. 2012) (“[T]he concentration of emissions [near smelters] in the absence of effective control equipment represents significant health hazards for the surrounding population.”).

¹⁸ Landrigan, *supra* note 16, at 204.

future. From 1990 to 2009, continuous growth in production from non-ferrous smelters caused a continuous increase in lead emissions from those sources.¹⁹ Although growth in production of non-ferrous metals is slowing,²⁰ there are other indications that the growth rate will stabilize and remain constant over the short-term. China's Ministry of Industry and Information Technology (MIIT) released China's 12th Non-Ferrous Metals Five-Year Plan in January 2012.²¹ The Plan's findings show high annual growth rates over the next several years for the copper, aluminum, lead, zinc, and nickel processing industries.²² Furthermore, the United States continues "to export the most polluting aspects of the mining industry [i.e. processing] to developing countries . . . with more lenient environmental and occupational regulations and little enforcement. . . . [L]ead ore exports from the U.S. to China grew by 50 percent between 2005 and 2010."²³

The lead-acid battery industry represents the overwhelming majority of lead demand.²⁴ Lead-acid battery production in China has increased dramatically over the past several years.²⁵ Experts predict that production will continue to expand in the future.²⁶ In fact, the rapid increase

¹⁹ Li, *supra* note 17, at 6.

²⁰ China's Non-ferrous metals production growth slowing – NRDC, LEAD BATTERY RECYCLING WORLD, <http://www.lead-battery-recycling.com/lead-news/China-Non-ferrous-metals-production-growth-slowing-NRDC.html> ("China's National Development and Reform Committee (NRDC) said the growth rate for production of 10 major nonferrous metals in China in the first nine months of [2012] has slowed 4.1 percentage points from last year's growth rate. Total output of the 10 major nonferrous metals increased 7.1% to 27.26 million tons year-on-year in the first nine months of this year, the NRDC recently reported.").

²¹ Wan Ling, Implications from China's 12th non ferrous metals Five Year Plan, CRU: The Independent Authority (Apr. 24, 2012), <http://www.crugroup.com/AboutCRU/cruinsight/chinanonferrousmetalsFiveYearPlan>.

²² *Id.* (predicting the following compound annual growth rates from 2011-2015: copper (5.2%); aluminum (8.6%); lead (7.9%); zinc (5.2%) and nickel (6.1%)).

²³ Environmental Impacts of Mining and Smelting, OCCUPATIONAL KNOWLEDGE INTERNATIONAL, <http://www.okinternational.org/mining>.

²⁴ *China's Lead Market Seen in Marginal Deficit in 2013*, BLOOMBERG NEWS (Nov. 8, 2012) <http://www.businessweek.com/news/2012-11-07/china-s-lead-market-seen-in-marginal-deficit-in-2013>. ("Batteries account for 85 percent of lead demand, compared with 27 percent in 1960, according to the International Lead Association in London, whose members include Xstrata and BHP Billiton Ltd.").

²⁵ Lead Battery Background, OCCUPATIONAL KNOWLEDGE INTERNATIONAL, <http://www.okinternational.org/lead-batteries/Background> ("[B]etween 2004 and 2010, lead battery production in China increased 133%.").

²⁶ *Id.* (citing Qi Wang, 废铅酸电池再生与污染控制 (Reproduction of Lead acid Battery and Pollution Control, Chinese Research Academy of Environmental Sciences), July 2010) ("Chinese lead battery output will continue to grow at an annual rate of 16.7% from 2009."); *China's Lead Market Seen in Marginal Deficit in 2013*, BLOOMBERG NEWS (Nov. 8, 2012) <http://www.businessweek.com/news/2012-11-07/china-s-lead-market-seen-in-marginal->

in battery production and demand has taken its toll on the Chinese lead market, with some analysts predicting a shortage in 2013.²⁷ According to Liu Yanlong, secretary general of the China Industrial Association of Power Sources, “[l]ead-acid batteries will continue to play a dominant role in cars, telecommunications, e-bikes and energy storage . . .”²⁸ Sustained future growth in the metals processing and lead-acid battery industries in China, and the increase in lead emissions that comes with that growth, makes stringent regulations and strict enforcement vitally important.

III. HISTORY AND CURRENT EXTENT OF INDUSTRIAL LEAD POLLUTION

A. *United States*

The history of industrial lead pollution in the United States is prolonged and severe. The scientific community did not know much about lead’s negative health effects until relatively late in the twentieth century.²⁹ As a result, science misjudged how much lead in the bloodstream results in poisoning. For example, before 1970, the threshold for lead poisoning was set by the CDC at a blood-lead concentration of 60 µg/dL.³⁰ In 1970, the government revised the lead poisoning standard to 40 µg/dL,³¹ which is still enormously high compared to the current 5 µg/dL standard. As a consequence, lead poisoning incidents associated with stationary point sources were underreported and poorly documented. “Smelertown,” a community located near

[deficit-in-2013](#) (“Production of lead-acid batteries is forecast to rise to 266 million Kilovolt-Ampere Hours in 2015 from 137 million KVAh [in 2011].”).

²⁷ *China’s Lead Market*, *supra* note 24.

²⁸ *Id.*

²⁹ *See, e.g.*, Lead Poisoning in the Smelting and Refining of Lead, Bulletin of the United States Bureau of Labor Statistics, 4 Industrial Accidents and Hygiene Series 58 (Feb. 17, 1914) (“There must have been much more sickness in the [1880s] than there is now; physicians, smelting experts, and old workmen all testify to this, but it is not easy to prove. Physicians who have practiced for many years [near smelters] have seldom kept records; and those who have done so have probably altered their standards as the years went on, and they now record as plumbism cases which formerly seemed too mild to notice.”).

³⁰ Rosevelle Marquez Morales, *Low Level Exposure and Changes in Lead Legislation*, TOXIC TORTS AND ENVIRONMENTAL LAW 55 (April 2007).

³¹ Mary Romero, *The Death of Smelertown: A Case Study of Lead Poisoning in a Chicano Community*, 4, available at <http://www.theirminesourstories.org/wp-content/uploads/2010/04/The-Death-of-Smelertown001-.pdf>.

the ASARCO smelter in El Paso, Texas, is one of the few well-documented cases. Thousands of “Smelertown” residents suffered from severe lead poisoning due to their proximity to the smelter.³² Although the lead poisoning standard in 1970 was set almost ten times higher than the current standard, the government nevertheless found approximately 250,000 cases of lead poisoning in the country.³³

As the effects of exposure to lead emissions became better understood, poisoning incidents associated with stationary point sources became better documented. For example, a 1980 case study found: “At lead smelters in El Paso, Texas, and in Kellogg, Idaho, 59 and 99%, respectively, of 1- through 9-year-old children living within 1.6km of the smelting plants had blood lead levels of $\geq 40 \mu\text{g/dL}$”³⁴ The CDC made three more revisions in 1985, 1990, and 2012, lowering the lead poisoning standard to $25 \mu\text{g/dL}$, $10 \mu\text{g/dL}$, and finally $5 \mu\text{g/dL}$.³⁵ The revisions reflect new scientific evidence that has consistently confirmed the toxic effects lead has on human health.³⁶ Although the incidence of lead poisoning has declined tremendously in the US since the 1990s,³⁷ violations of emissions standards still occur.³⁸

By 1990, total lead emissions from vehicles and point sources had dropped 87 percent and air concentrations had dropped 85 percent from 1981, almost entirely due to the widespread

³² See generally, Mary Romero, *The Death of Smelertown: A Case Study of Lead Poisoning in a Chicano Community*, available at <http://www.theirminesourstories.org/wp-content/uploads/2010/04/The-Death-of-Smelertown001-.pdf>.

³³ Sven Hernberg, *Lead Poisoning in a Historical Perspective*, 38 AMERICAN JOURNAL OF INDUSTRIAL MEDICINE, 244, 249 (2000).

³⁴ Landrigan, *supra* note 16, at 204.

³⁵ Rosevelle Marquez Morales, *Low Level Exposure and Changes in Lead Legislation*, TOXIC TORTS AND ENVIRONMENTAL LAW, 55–6 (April 2007).

³⁶ *Id.* at 55.

³⁷ Sewell Chan, *Lead Poisoning Cases Decline*, The New York Times (July 3, 2008) available at http://www.nytimes.com/2008/07/03/nyregion/03lead.html?_r=0.

³⁸ U.S. EPA Settles with Lead Acid Battery Manufacturer in Corona for Air Violations, Press Release (Oct. 1, 2012) available at <http://yosemite.epa.gov/opa/admpress.nsf/0/91CFB40EE983F88F85257A8B0060D638> (“By failing to monitor and test its pollution controls, the [CA lead acid battery manufacturer] increased the health risks for employees and the nearby community, said Jared Blumenfeld, EPA’s Regional Administrator for the Pacific Southwest.”).

use of unleaded gasoline in road vehicles.³⁹ Atmospheric lead emissions from stationary point sources fluctuated during the 1980s: 3000 metric tons/yr in 1981, 1900 metric tons/yr in 1987, 2000 metric tons/year in 1988, 2300 metric tons/year in 1989, 2200 metric tons/year in 1990.⁴⁰ In 1990, 12 “nonattainment” areas exceeded the National Ambient Air Quality Standard (NAAQS) for lead.⁴¹ By 1995, metals processing and battery manufacturing plants had taken over as the major sources of lead emissions.⁴² “In 1995, nine lead point sources had one or more site-oriented monitors that exceeded the NAAQS. . . . Nine counties, with a total population of 4.7 million and containing the [9] point sources . . . did not meet the lead NAAQS in 1995.”⁴³

In 2000, EPA claimed that “the only violations of the lead national air quality standard occur near large industrial sources such as lead smelters.”⁴⁴ In 2010, EPA stated: “[t]he typical average concentration near a stationary source (e.g., metals processors, battery manufacturers, and mining operations) is approximately eight times the typical concentration at a site that is not near a stationary industrial source. . . . Of the 196 sites shown [in the report], 34 sites exceeded the 2008 lead standard. All of these sites are located near stationary lead sources.”⁴⁵ Currently, there are 21 nonattainment areas for lead.⁴⁶ These areas are located in 22 counties with a total

³⁹ National Air Quality and Emissions Trends Report, EPA-450/4-91-023, 1-14 (1990) *available at* http://www.epa.gov/airtrends/pdfs/Trends_Report_1990.pdf.

⁴⁰ *Id.*

⁴¹ National Air Quality and Emissions Trends Report, EPA 454/R-98-016 (Dec. 1998).

⁴² National Air Quality and Emissions Trends Report, 14 (1995) *available at* <http://www.epa.gov/airtrends/aqtrnd95/report/files/chapt2.pdf> (“The highest concentrations of lead are found in the vicinity of nonferrous smelters and other stationary sources of lead emissions.”).

⁴³ *Id.*

⁴⁴ Latest Findings on National Air Quality: 2000 Status and Trends, EPA 454/K-01-002, 15 (2000) *available at* <http://www.epa.gov/airtrends/aqtrnd00/brochure/00brochure.pdf>.

⁴⁵ Our Nation’s Air: Status and Trends Through 2010, 16 (2010) *available at* <http://www.epa.gov/airtrends/2011/report/lead.pdf>.

⁴⁶ Lead 2008 Standard Nonattainment Areas, Environmental Protection Agency (Dec. 14, 2012), <http://www.epa.gov/airquality/greenbook/mnc.html> (Arecibo, Puerto Rico; Belding, MI; Bellefontaine, OH; Bristol, TN; Chicago, IL; Cleveland, OH; Delta, OH; Eagan, MN; Frisco, TX; Granite City, IL; Iron, Dent, and Reynolds Counties, MO; Jefferson County, MO; Los Angeles County-South Coast Air Basin, CA; Lower Beaver Valley, PA; Lyons, PA; Muncie, IL; North Reading, PA; Pottawattamie, PA; Saline County, KS; Tampa, FL; Troy, AL).

population of 9,669,009.⁴⁷ The last primary lead smelter, Doe Run, is scheduled to shut down in 2013.⁴⁸

B. China

Industrial lead pollution in China is a relatively recent phenomenon and its growth has coincided with China's meteoric economic development.⁴⁹ High-blood levels are especially widespread among Chinese children. In June 21, 2011, Elizabeth O'Brien, head of the Australian-based non-governmental organization, The LEAD Group, stated: "About 34% of Chinese children have blood lead levels that exceed the WHO limit for so-called safe levels of lead in blood of 10 µg/dL. This is in comparison to the less than 1% of children in the US that have levels above the WHO limit."⁵⁰ There is not a lot of information, however, which documents the extent to which these high blood-lead levels in China are due to emissions from stationary sources in China.

A 2012 study identifies motor vehicle gasoline combustion, coal combustion, and nonferrous metal smelting as the three largest contributors of atmospheric lead emissions over the past 20 years in China.⁵¹ From 1990 to 2000, the study estimates that leaded gasoline in motor vehicles "contributed more than 78% of the total emissions"; once the ban on leaded gasoline went into effect, however, emissions attributable to leaded gasoline dropped to a

⁴⁷ Lead 2008 Standard Nonattainment Area Summary, Environmental Protection Agency (Dec. 14, 2012), <http://www.epa.gov/airquality/greenbook/mnsum.html>.

⁴⁸ Leah Thorsen, *Lead smelter in Herculaneum set to close in 2013*, ST. LOUIS POST-DISPATCH (Oct. 9, 2010), http://www.stltoday.com/news/local/metro/lead-smelter-in-herculaneum-set-to-close-in/article_54400025-2940-5b3f-b753-6e931e596cac.html.

⁴⁹ Li, *supra* note 17, at 5 ("The large amount of lead emissions can be explained by the growing demands for energy and increasing industrial production. As a result of these demands, the emissions are not only larger than the emissions in other countries but also showed an increasing trend.").

⁵⁰ Spotlight on High Cases of Lead Poisoning in China, The Lead Group Incorporated (June 1, 2011), http://www.lead.org.au/mr/Media_Release_20110621.pdf.

⁵¹ Li, *supra* note 17, at 3 (stating that 196,700 tons of lead was emitted into the atmosphere from 1990 – 2009; over that period, motor vehicle gasoline combustion contributed 117,800 tons, coal combustion contributed 46,300 tons, and nonferrous metal smelting contributed 26,100 tons).

negligible portion of total lead emissions.⁵² Countrywide, total emissions have decreased from 13,700 tons in 1990 to 9,600 tons in 2009. From 2005 to 2009, the provinces producing the most atmospheric lead emissions were located in central and eastern China.⁵³ The 2012 study, however, is flawed. It does not include atmospheric lead emissions from small- to medium-sized smelting operations, which generally do not comply with environmental regulations and have no or defective emissions control systems in place.⁵⁴

Chinese copper, lead, and zinc smelters “vary from sophisticated facilities with good emissions controls to primitive artisanal smelting operations that have no controls at all.”⁵⁵ “Copper smelting, the largest source of emissions from non-ferrous smelting in China, emitted 17800 t (9%) of lead during the period 1990-2009.”⁵⁶ “Lead and zinc smelting released 4100 t and 4200 t, respectively.”⁵⁷ Industry growth has caused nonferrous smelting emissions to increase continuously since 1990.⁵⁸ The increase in stationary source emissions is particularly troublesome given that many communities are located next to offending smelters.⁵⁹ The regions of Jiangxi, Anhui, Yunnan, Gansu and Henan are the main culprits with respect to emissions from nonferrous smelting facilities.⁶⁰

⁵² *Id.* at 3, 5 (stating that in 2001, leaded gasoline represented 5 percent of total lead emissions).

⁵³ *Id.* at 3 (“Top five emission-producing provinces [from 2005 to 2009] were as follows: 5500 t from Shandong, 3000 t from Hebei, 2700 t from Shanxi, 2400 t from Henan, and 2300 t from Jiangsu. The five largest emission regions produced nearly 40% of the total.”)

⁵⁴ *Id.* at 6 (“Small- and medium- sized enterprises located in remote areas with crude production facilities and defective emissions management systems were involved in most of these cases [lead poisoning incidents in recent years]. Certain small companies do not comply with the environmental impact assessment and environmental inspection procedures. This situation produces a large number of pollution incidents. Moreover, most of the production from these small plants has not been included in the national statistical data used in the present study.”).

⁵⁵ *Id.* at 3.

⁵⁶ *Id.* at 6.

⁵⁷ *Id.*

⁵⁸ *Id.* (“With the growth of production, emissions from non-ferrous metal smelting sources increased continuously each year [1990-2009].”).

⁵⁹ *Id.* (“[T]he concentration of emissions in the absence of effective control equipment represents significant health hazards for the surrounding population.”).

⁶⁰ *Id.*

Although there is a dearth of specific and accurate numerical assessments of industrial lead pollution, anecdotal evidence abounds. There are countless examples of lead poisoning incidents in the last ten years due to atmospheric lead emissions from stationary point sources, including smelting facilities and lead-acid battery factories.⁶¹ Of particular concern are “cancer villages,” where clusters of disease-ridden populations have sprung up near factories in predominantly rural areas.⁶² Residents of cancer villages are typically “undereducated, poor farmers that know little of the effects of the noxious vapors and poisonous emissions pouring out of nearby factories.”⁶³ “[L]ocal, small-scale industry, particularly lead battery recycling, has created hot spots of exposure where the situation is grave and levels reach those of classical lead poisoning of a type rarely seen in North America or Europe for a century.”⁶⁴ Significantly, China’s Ministry of Environmental Protection (MEP) recently released a report acknowledging for the first time the emergence of cancer villages in China due to severe pollution.⁶⁵ Thus, although the extent of lead poisoning in China is difficult to accurately quantify, it presents a

⁶¹ See, e.g., Alexa Olsen, *Smelting plant blamed for poisoning hundreds*, IOL SCITECH (Sept. 12, 2006), <http://www.iol.co.za/scitech/technology/smelting-plant-blamed-for-poisoning-hundreds-1.293338> (Sep. 2006: Hui County, Gansu Province, “hundreds of people,” Hui County Non-Ferrous Metal Smelting Plant); Christopher Bodeen, *China Investigating Child Lead Poisoning Cases*, THE ASSOCIATED PRESS (Mar. 17, 2010), http://www.thestreet.com/story/10705008/1/china-investigating-child-lead-poisoning-cases.html?cm_yen=GOOGLEFI (Feb. 2010: Jiahe County, Hunan Province, 254 of 397 children tested showed excessive blood lead levels lead smelters and battery factories, Tengda Metal Recycling Company); Monica Dybuncio, *China lead poisoning outbreak hits more than 600*, CBS NEWS (June 13, 2011), http://www.cbsnews.com/8301-504763_162-20070757-10391704.html (May 2011: Yangxunqiao, more than 600 people, 103 children, tinfoil processing plant); *Plant sickens kids living on same street*, CHINA-WIRE (Aug. 23, 2012), <http://china-wire.org/?p=22924> (August 2012: “At least 196 children living on a street near a coal-fired power plant are suffering from lead poisoning in Lianzhou, South China’s Guangdong Province.”); Bill Dodson, *China Inside Out: 10 Irreversible Trends Reshaping China and its Relationship with the World*, Chapter 4 (Feb. 2011) (August 2009: more than 600 children poisoned, Dongling Town Lead and Zinc Smelting Plant).

⁶² Jonathan Watts, *China’s ‘cancer villages’ reveal dark side of economic boom*, THE GUARDIAN (June 6, 2010), <http://www.guardian.co.uk/environment/2010/jun/07/china-cancer-villages-industrial-pollution>; Lee Liu, *Made in China: Cancer Villages*, ENVIRONMENT: SCIENCE AND POLICY FOR SUSTAINABLE DEVELOPMENT (Mar./Apr. 2010), <http://www.environmentmagazine.org/Archives/Back%20Issues/March-April%202010/made-in-china-full.html>.

⁶³ Dodson, *supra* note 61.

⁶⁴ Tee L. Guidotti, *Lead pollution and industrial opportunism in China*, OUPblog (June 28, 2011), <http://blog.oup.com/2011/06/lead-pollution/>.

⁶⁵ *China acknowledges ‘cancer villages,’* BBC NEWS (Feb. 22, 2013), <http://www.bbc.co.uk/news/world-asia-china-21545868>.

serious health issue for Chinese citizens, particularly those living next to stationary point sources of pollution.

IV. ENFORCEMENT MEASURES

A. *United States*

The US regulatory regime with respect to stationary point sources of lead is characterized by cooperative federalism. States and local governments work with the federal government to comply with the law. Historically, however, in the absence of meaningful federal legislation, states neglected to adequately regulate point sources, focusing on industrial growth at the expense of the environment. No impetus for regulation came from the general public, either, due to its lack of awareness of the health risks associated with air pollution. The passage of the Clean Air Act (CAA) and its amendments changed this dynamic. The CAA grants states and local governments significant responsibility in terms of monitoring, inspections, and enforcement.⁶⁶ The CAA also grants various “sticks” to EPA, however, which are useful tools in coercing states to meaningfully combat air pollution.

1) Brief Regulatory History

First, it is illustrative to briefly summarize the history of stationary source atmospheric emissions in the United States. In general, states failed to abate air pollution throughout the 1950s and 60s. Since the 1950s, the US has engaged in efforts to reduce industrial lead emissions. In 1955, Congress passed the Air Pollution Control Act.⁶⁷ This represents the first federal air pollution legislation. Specifically, the Act funded research to identify the scope and sources of air pollution but left regulating air pollution to state and local governments. In 1963, Congress passed the CAA, which represents the first federal legislation aimed at *controlling* air

⁶⁶ The CAA grants states broad authority in this area because they are specially positioned to craft solutions tailored to the unique circumstances within each state.

⁶⁷ 69 Stat. 322, P.L. 84–159.

pollution. The CAA “established a federal program within the U.S. Public Health Service and authorized research into techniques for monitoring and controlling air pollution.”⁶⁸ Even with the passage of the 1967 Air Quality Act, which designated air quality regions and gave states the authority to enforce standards in those regions,⁶⁹ air pollution was still not yet a widespread public concern.⁷⁰ States were more focused on economic growth than public health, and the American public was generally unaware of the link between pollution and health problems. This lack of concern is reflected in the Act’s failure: “By 1970, fewer than three dozen air quality regions had been designated, as compared to an anticipated number in excess of 100. Moreover, not a single state had developed a full pollution control program.”⁷¹

In 1970, the National Environmental Policy Act established the Environmental Protection Agency (EPA) and Congress passed amendments to the CAA (CAAA). The 1970 amendments represent a watershed in terms of the public support for meaningful air pollution control they garnered.⁷² They were drafted to deal with the ineffectiveness of the 1963 CAA and 1967 Air Quality Act. Maine Senator Edmund Muskie took a leading role in drafting the amendments. He knew “that States and localities need greater incentives and assistance to protect the health and welfare of all people.”⁷³

Specifically, the 1970 CAAA granted EPA the authority to establish NAAQS, which are outdoor air quality standards governing six criteria pollutants, one of which is lead. NAAQS are put in place for the purpose of protecting public health, and the 1970 CAAA imposed deadlines for compliance with those standards. In addition, the 1970 CAAA established three other major

⁶⁸ History of the Clean Air Act, Environmental Protection Agency, http://epa.gov/air/caa/caa_history.html.

⁶⁹ Paul G. Rogers, *The Clean Air Act of 1970*, EPA JOURNAL (Jan./Feb. 1990) available at <http://www.epa.gov/aboutepa/history/topics/caa70/11.html>.

⁷⁰ *Id.* (“Congress as a whole and American industry were not yet convinced of the need for a national strategy for pollution control.”).

⁷¹ *Id.*

⁷² *Id.*

⁷³ 116 Cong. Rec. 32, 901 (1970).

regulatory initiatives with respect to stationary point sources of lead emissions: State Implementation Plans (SIPs),⁷⁴ New Source Performance Standards (NSPS),⁷⁵ and the power to bring citizen suits.⁷⁶ Specifics are discussed in the next section.

More amendments in 1977 instituted “requirements pertaining to sources in non-attainment areas for NAAQS.”⁷⁷ A non-attainment area is a geographic area that does not adhere to one or more of the NAAQS. The 1977 CAAA requirements included major permit review for stationary sources “to ensure attainment and maintenance of the NAAQS.”⁷⁸ In addition, the amendments precluded construction of a major stationary source if its emissions would worsen the air pollution problem in a nonattainment area.⁷⁹ In 1978, EPA promulgated a 1.5 µg/m³ NAAQS standard for lead.⁸⁰ In accordance with the new standard, states were required to submit revised SIPs for areas not in attainment with this standard.⁸¹

The final amendments to the CAA in 1990 firmly established the federal government’s enlarged role in regulating air pollution. Specifically, it “clarifies how areas are designated and redesignated ‘attainment’” and it “allows EPA to define the boundaries of ‘nonattainment’ areas.”⁸² Additionally, these amendments stipulated what actions EPA may take when it finds a violation.⁸³ Finally, the 1990 CAAA installed an operating permit program for stationary

⁷⁴ 42 U.S.C. § 7410.

⁷⁵ 42 U.S.C. § 7411.

⁷⁶ 42 U.S.C. 7604(a)(2) (to compel EPA to fulfill nondiscretionary duty).

⁷⁷ History of the Clean Air Act, *supra* note 68.

⁷⁸ *Id.*

⁷⁹ 42 U.S.C. § 7503(1)(A).

⁸⁰ National Primary and Secondary Ambient Air Quality Standards for Lead, 43 F.R. 46246, 40 C.F.R. pt. 50 (Oct. 4, 1978).

⁸¹ 42 U.S.C. § 7502.

⁸² Overview – The Clean Air Act Amendments of 1990, Environmental Protection Agency, http://epa.gov/oar/caa/caaa_overview.html.

⁸³ The Plain English Guide to the Clean Air Act, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF AIR QUALITY PLANNING AND STANDARDS, EPA-456/K-07-001, 19 (Apr. 2007), *available at* <http://www.epa.gov/air/caa/peg/pdfs/peg.pdf> (“In general, when EPA finds that a violation has occurred, the agency can issue an order requiring violator to comply, issue an administrative penalty order (use EPA administrative authority to force payment of a penalty), or bring a civil judicial action (sue the violator in court).”).

sources of air pollution.⁸⁴ It required EPA to issue regulations governing state permit programs, and it required states to “submit to EPA a permit program meeting these regulatory requirements.”⁸⁵ The permitting program was designed to “greatly enhance the ability of Federal and state agencies to evaluate its air quality situation.”⁸⁶

In 2008, EPA again revised the NAAQS for lead, reducing it from 1.5 $\mu\text{g}/\text{m}^3$ to 0.15 $\mu\text{g}/\text{m}^3$, a factor of ten.⁸⁷ Each state once again must “submit state implementation plans outlining how they will reduce pollution to meet the [NAAQS].”⁸⁸ The first round of SIPs demonstrating attainment was due in June 2012 and the second round is due in June 2013.⁸⁹ By January 2017, “[s]tates are required to meet the new standards.”⁹⁰

With respect to the first round as of February 2013, EPA has found that seven states failed to submit complete SIPs.⁹¹ EPA in theory has the authority to promulgate a federal implementation plan (FIP) after such a finding.⁹² EPA, however, has historically avoided implementing FIPs; it simply does not have the resources available or experience tailoring policy to local conditions to develop an appropriate implementation plan.⁹³ “For example, after 25 years of failing to prepare an approvable SIP, the South Coast of California was still not

⁸⁴ History of the Clean Air Act, Environmental Protection Agency, *supra* note 68; 42 U.S.C. §§ 7475(a); 7502(c)(5).

⁸⁵ Overview – The Clean Air Act Amendments of 1990, *supra* note 82.

⁸⁶ *Id.*

⁸⁷ 73 F.R. 66964, November 12, 2008, National Ambient Air Quality Standards for Lead, Final Rule.

⁸⁸ Tristan Fowler, *A Brief History of Lead Regulation*, SCIENCE PROGRESS (Oct. 21, 2008), <http://scienceprogress.org/2008/10/a-brief-history-of-lead-regulation/>.

⁸⁹ SIP Toolkit – NAAQS Implementation Schedules, Environmental Protection Agency, <http://www.epa.gov/oaqps001/lead/kitschedule.html>.

⁹⁰ Fowler, *supra* note 88.

⁹¹ 40 C.F.R. pt. 52, 78 F.R. 12962 (Feb. 2013) (Hawaii, Illinois, Massachusetts, New Jersey, Oregon, Vermont, and Washington failed to submit complete SIPs.).

⁹² 42 U.S.C. § 7410(c)(1).

⁹³ Reitze, *supra* note 14, at 66.

subjected to a FIP.”⁹⁴ Thus, FIPs have not assumed a major enforcement role with respect to NAAQS.⁹⁵

2) SIPs and NSPS: EPA’s Tools to Coax States into Compliance with the Lead NAAQS

The SIP is perhaps EPA’s most powerful tool in coaxing states into NAAQS compliance. The 1970 CAAA require each state to develop a SIP for attainment and maintenance of NAAQS, and each plan must be approved by EPA.⁹⁶ There are nine general requirements concerning SIP nonattainment plans: 1) existing sources must implement reasonably available control measures (RACMs) that require reasonably available control technology (RACT); 2) SIPs must require reasonable further progress (RFP)⁹⁷; 3) all sources must track and submit statistics regarding actual emissions; 4) emissions from new or modified major sources must be quantified and such emissions cannot interfere with the area’s attainment of NAAQS; 5) they must require a construction and/or operating permit for new or modified major stationary sources; 6) they must contain enforceable emission limitations and control measures to provide for NAAQS attainment; 7) they must meet all requirements of CAA § 110(a)(2); 8) they may use techniques/procedures that EPA determines are equivalent to that of EPA-approved techniques/procedures; and 9) they must have contingent measures in place that take effect if the state fails to make RFP or attain NAAQS.⁹⁸ Additionally, lead SIPs “must contain a demonstration showing that the plan will attain and maintain the [NAAQS]” in those areas in which stationary point sources of atmospheric lead emissions operate.⁹⁹

⁹⁴ *Id.* (citing Alan C. Waltner, Paradise Delayed—The Continuing Saga of the Los Angeles Basin Federal Clean Air Implementation Plan, 14 UCLA J. ENVTL. L. & POLICY 247, 273 (1995/1996)).

⁹⁵ *Id.*

⁹⁶ 42 U.S.C. § 7410.

⁹⁷ 42 U.S.C. § 7501(1).

⁹⁸ 42 U.S.C. § 7502(c).

⁹⁹ Requirements for Preparation, Adoption, and Submittal of Implementation Plans, Additional Provisions for Lead, 40 CFR pt. 51.117.

Once approved by EPA, SIPs are codified in the Federal Code¹⁰⁰ and enforceable as state and federal law.¹⁰¹ In general, states have broad authority to design their SIP. EPA, however, has final authority to determine whether any SIP conforms to the requirements stipulated in CAA.

NSPS are EPA-issued standards with respect to air emissions from “new sources.” A “new source” for purposes of NSPS means any newly-constructed or modified stationary source.¹⁰² EPA establishes standards for lead applicable to all “new” lead-acid battery manufacturers.¹⁰³ These standards represent the upper limit of atmospheric lead emissions allowed.

3) EPA Sanctions on States and Localities to Enforce Compliance with SIPs

EPA plays a large role under the CAA in enforcing lead emission standards with respect to stationary sources. As mentioned before, the SIP is EPA’s most effective tool to force states to implement air pollution controls. In the event the Administrator finds an SIP inadequate, EPA requires the state to revise the plan and correct its inadequacies.¹⁰⁴

EPA has two types of sanctions at its disposal.¹⁰⁵ Highway funding sanctions allow EPA Administrator to “prohibit the approval of certain projects by the Secretary of Transportation or the awarding of certain grants under Title 23 of the U.S. Code.”¹⁰⁶ Certain projects are exempt from these sanctions.¹⁰⁷ EPA applies “exemption criteria . . . to determine which projects could advance if [EPA] imposes high sanctions.”¹⁰⁸ The second type is the 2-1 emissions offset

¹⁰⁰ 40 C.F.R. pt. 52.

¹⁰¹ 42 U.S.C. § 7413.

¹⁰² 42 U.S.C. §7411(a)(2).

¹⁰³ 40 C.F.R. pt. 60.372.

¹⁰⁴ 42 U.S.C. 7410(k)(5).

¹⁰⁵ 42 U.S.C. §7509(b).

¹⁰⁶ *Id.*

¹⁰⁷ 61 F.R. 14363.

¹⁰⁸ *Id.*

sanction. This requires existing stationary point sources in nonattainment areas to reduce their emissions by a ratio of at least two-to-one in relation to emissions from new or modified stationary sources.¹⁰⁹

Depending upon the circumstances, EPA may or must apply these sanctions to compel states to submit and administer effective SIPs.¹¹⁰ EPA has the discretion to impose sanctions when: “[1] the Administrator makes a finding under section 179(a)(1) through (4)¹¹¹ and [2] the Agency has followed all procedural [due process] requirements, i.e., rulemaking requirements, such as notice and comment, for imposing a sanction.”¹¹² Once these requirements are satisfied, EPA may apply sanctions to any area of the state “the Administrator deems ‘reasonable and appropriate.’”¹¹³ The Administrator must consider certain criteria in making this “reasonable and appropriate” determination.¹¹⁴ If one or several political subdivisions of the state satisfy the criteria, EPA must limit the sanctions, if it chooses to impose them, accordingly.¹¹⁵ If, however, at least one subdivision does not satisfy all “reasonable and appropriate” criteria, EPA has the discretion to impose sanctions on the entire state.

¹⁰⁹ Reitze, *supra* note 14, at 120.

¹¹⁰ 42 U.S.C. §§ 7410(m); 7509(a).

¹¹¹ The four types of findings that trigger discretionary sanctions are: “(1) that a state has failed to submit a SIP or an element of a SIP for a nonattainment area, or the SIP or SIP element fails to meet the completeness criteria issued pursuant to section 110(k); (2) that a SIP submission is disapproved for a nonattainment area based on its failure to meet one or more plan elements required by the CAA; (3) that the state has not made any other submissions, or has not made a complete submission, as required by the amended CAA, or that such a submission is disapproved; or (4) that a requirement of an approved plan is not being implemented.” Reitze, *supra* note 14, at 120.

¹¹² *Id.*

¹¹³ 42 U.S.C. § 7410(m).

¹¹⁴ 59 F.R. 1476; “EPA uses five criteria to determine when a state has relinquished its primary control over an activity to a political subdivision and the political subdivision has failed to perform that required activity. EPA concludes that this delegation is established when a political subdivision: (1) has the legal authority to perform the required activity; (2) has traditionally performed, or has been delegated the responsibility to perform, the required activity; (3) has received, where appropriate, adequate funding or authority to obtain funding from the state to perform the required activity; (4) has agreed to perform (and has not revoked that agreement) or is required to accept responsibility for performing the required activity; and (5) has failed to perform the required activity.” Reitze, *supra* note 14, at 123.

¹¹⁵ Reitze, *supra* note 14, at 123 (“If one or more political subdivisions meet all five of the criteria, EPA will consider those subdivisions principally responsible; therefore, EPA may impose sanctions only on those political subdivisions and on other areas (short of the entire state) for which the Agency determines it is reasonable and appropriate.”).

The CAA requires EPA to impose the emissions offset sanction after a 179(a)(1) through (4) finding unless the state corrects the relevant deficiency within 18 months after the finding.¹¹⁶ If, after another six months, the state has still not corrected the deficiency, EPA must also impose the highways funds sanction until the SIP comes into compliance.¹¹⁷

EPA applied sanctions 18 times from 1995 to 1999.¹¹⁸ The emission offset was applied to lead SIPs in three instances, and the highway funds sanction was applied to one lead SIP on one occasion.¹¹⁹ The three nonattainment areas to which sanctions were applied are: Lewis and Clark County, MT¹²⁰; Iron County, MO¹²¹; and Douglas County, NE.¹²² In all three cases, sanctions stayed in place for less than two years before they were lifted.¹²³

4) EPA's Options to Ensure Individual Polluters Comply with SIPs

Although states take primary responsibility for enforcing the CAA,¹²⁴ EPA “functions as a backstop, with authority to review state actions.”¹²⁵ The CAA authorizes the EPA Administrator to take several actions in order to ensure individual polluters comply with SIP provisions. Specifically, EPA may issue compliance and administrative penalty orders, and it may bring civil actions.¹²⁶ In April 2011, EPA brought such a civil action against the owner of a secondary nonferrous metals smelting facility in Chicago, Illinois, alleging that the facility

¹¹⁶ 42 U.S.C. § 7509(a)(4); 59 F.R. 39382-01, 40 CFR pt. 52.

¹¹⁷ 42 U.S.C. § 7509(a)(4); 59 F.R. 39382-01, 40 CFR pt. 52.

¹¹⁸ James E. McCarthy, Highway Fund Sanctions and Conformity under the Clean Air Act, CRS Report for Congress (Oct. 15, 1999), <http://www.cnie.org/NLE/CRSreports/transportation/trans-29.cfm>.

¹¹⁹ *Id.*

¹²⁰ Federal and State Ambient Air Quality Standards, Citizens' Guide to Air Quality in Montana, Department of Quality, <http://deq.mt.gov/airmonitoring/citguide/understanding.mcp>.

¹²¹ 40 CFR pt. 52, 97 F.R. 5132.

¹²² McCarthy, *supra* note 118.

¹²³ *Id.*

¹²⁴ Clean Air Act, United States, The Encyclopedia of Earth, http://www.eoearth.org/article/Clean_Air_Act,_United_States (“[T]he Clean Air Act is enforced primarily by states or local governments; they issue most permits, monitor compliance, and conduct the majority of inspections.”).

¹²⁵ *Id.*

¹²⁶ 42 U.S.C. § 7413.

released atmospheric lead emissions in violation of Illinois's SIP.¹²⁷ In January 2013, EPA and the polluter, H. Kramer and Co., signed a consent decree.¹²⁸ Under its terms, the facility must pay \$35,000 in damages and spend \$3 million on pollution control technology.¹²⁹ This is a recent example of EPA using its enforcement authority to ensure private companies comply with the SIPs.

5) Role of Citizen Suits

Citizen suits are also an important enforcement tool. Pursuant to the CAA, any person may bring a civil lawsuit 1) against any person in violation of the CAA; 2) against EPA where it has failed to perform a nondiscretionary duty under the CAA; and 3) against anyone who constructs any new or modified major stationary source facility without the required permit.¹³⁰ The CAA requires a person filing such a lawsuit to first notify EPA, the state, and any alleged violator of the action.¹³¹ The citizen may then file the suit 60 days after he has given such notice.¹³²

A recent and noteworthy citizen suit concerns a lead products manufacturing plant in Frisco, Texas. The Exide plant recycles lead-acid batteries and “is located in close proximity to residents, including particularly sensitive receptors such as school-age children, public parks, schools, commercial businesses, and Frisco's Child Development Center.”¹³³ In July 2012, Frisco Unleaded, a non-profit organization, sent notices of intent to file suit against Exide for its

¹²⁷ Michael Hawthorne, *Feds and state crack down on air pollution outside Chicago school*, CHICAGO TRIBUNE (Apr. 21, 2011), http://articles.chicagotribune.com/2011-04-21/news/ct-met-pilsen-lead-pollution-20110421_1_lead-pollution-smelter-perez-elementary-school.

¹²⁸ Michael Hawthorne, *Pilsen polluter H. Kramer agrees to cut lead emissions*, CHICAGO TRIBUNE (Jan. 31, 2013), http://articles.chicagotribune.com/2013-01-31/news/chi-pilsen-polluter-h-kramer-agrees-to-cut-lead-emissions-20130131_1_aggression-and-criminal-behavior-lead-pollution-air-pollution.

¹²⁹ *Id.*

¹³⁰ 42 USC § 7604(a)(1)-(3).

¹³¹ 42 USC § 7604(b).

¹³² 42 USC § 7604(b).

¹³³ Letter to Exide Technologies, July 9, 2012, <http://friscounleaded.com/wp-content/uploads/2012/07/Notice-Letter.pdf>

violations of the Texas SIP and permitting requirements. As per CAA requirements, the plaintiff non-profit must wait 60 days after this notification before filing the lawsuit. No further information regarding the status of the lawsuit is currently available.¹³⁴

B. China

Stationary point sources of atmospheric lead emissions in China are bound by legislation, regulations, and standards. Private, and potentially public, lawsuits also play a significant enforcement role.

1) Law for the Prevention and Control of Atmospheric Pollution

The law governing air pollution in China is called The Law of the People's Republic of China for the Prevention and Control of Atmospheric Pollution (PCAP). It was adopted in 1987 by the NPC Standing Committee and became effective in June 1988.¹³⁵ The original law grants MEP the responsibility for establishing the ambient air quality standard (“Air Quality Standard”)¹³⁶ and the Integrated Emission Standards of Air Pollutants,¹³⁷ and it stipulates the environmental impact assessment (EIA) requirement,¹³⁸ duties attaching to sources that discharge pollutants,¹³⁹ legal ramifications facing sources and their managers that violate PCAP,¹⁴⁰ monitoring systems,¹⁴¹ and fees associated with discharge.¹⁴² In 1995, PCAP was amended and its articles were renumbered. The most important amendment in 1995 was the Eliminative

¹³⁴ Anthony Tosie, *Citizen groups plan to file lawsuit regarding Exide plant*, STAR LOCAL NEWS, July 16, 2012, http://www.scntx.com/articles/2012/07/16/frisco_enterprise/news/661.txt.

¹³⁵ Charles R. McElwee, *Environmental Law in China: Mitigating Risk and Ensuring Compliance*, 62 (2011).

¹³⁶ Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution (1987), art. 6.

¹³⁷ *Id.* at art. 7.

¹³⁸ *Id.* at art. 9.

¹³⁹ *Id.* at art. 10.

¹⁴⁰ *Id.* at arts. 31, 32, 33, 34.

¹⁴¹ *Id.* at art. 16.

¹⁴² *Id.* at art. 11.

System of Backward Technology and Equipment.¹⁴³ In 2000, more amendments passed, the most important being the System of Control of the Total Amount of Pollutants.¹⁴⁴

Pursuant to PCAP, MEP establishes the national ambient air quality standards.¹⁴⁵ Subnational governments may establish local standards that are more stringent than the national standard.¹⁴⁶ The current ambient air quality standard and comprehensive discharge standard for atmospheric pollutants are discussed further below.

PCAP requires all construction projects, concerning both new and modified sources of atmospheric pollutants, to complete a EIA before construction may begin.¹⁴⁷ The EIA must be submitted to, examined by, and approved by the local environmental protection bureau (EPB) before it may operate.¹⁴⁸

PCAP also imposes various duties on operators of stationary sources of air pollution. First, these sources must report to their local EPBs both the particular pollution abatement facilities in operation at the facility and the categories, quantities, and densities of the pollutants that the facility discharges under normal operating conditions.¹⁴⁹ Second, these sources have a duty to submit “the relevant technical data concerning the prevention and control of atmospheric pollution.”¹⁵⁰ Third, stationary sources must “report in due time about any substantial change in

¹⁴³ *Id.* at art. 19

¹⁴⁴ *Id.* at art. 3 (“The State takes measures to control or gradually reduce, in a planned way, the total amount of the major atmospheric pollutants discharged in different areas. The local governments shall be responsible for the quality of the atmospheric environment in areas under their jurisdiction. They shall make plans and take measures to ensure that the quality of the atmospheric environment within said areas meets the relevant standards.”).

¹⁴⁵ *Id.* at art. 7.

¹⁴⁶ *Id.* at art. 7.

¹⁴⁷ *Id.* at art. 11 (“New construction projects, expansion or reconstruction projects which discharge atmospheric pollutants shall be governed by the State regulations concerning environmental protection for such projects. An environmental impact statement on construction projects shall include an assessment of the atmospheric pollution the project is likely to produce and its impact on the ecosystem, stipulate the preventive and curative measures.”).

¹⁴⁸ *Id.* at art. 11.

¹⁴⁹ *Id.* at art. 12.

¹⁵⁰ *Id.*

the category, quantity or concentration of the atmospheric pollutants discharged.”¹⁵¹ Fourth, discharging units shall keep their facilities for treating atmospheric pollutants in regular operation.¹⁵² In cases where such pollution abatement facilities are to be shutdown or left idle, the operator has a duty to report the matter to the county-level EPB for approval in advance.¹⁵³

Violators of PCAP are subject to a range of legal consequences under PCAP, including penalties, orders to discontinue use, operation, or production, orders to shutdown, orders to rectify within a specified period of time, and orders to dismantle.¹⁵⁴ Additionally, managers of the violating facilities shall be investigated and may be punished or penalized.¹⁵⁵

PCAP delegates to MEP the responsibility for formulating a nationwide monitoring system for atmospheric pollution.¹⁵⁶ MEP or local EPBs may conduct on-site inspections of stationary sources.¹⁵⁷ Any source subject to such an inspection must supply the investigating body with any information necessary to carry out the inspection.¹⁵⁸ Additionally, pursuant to PCACP there is a permitting system in place governing stationary sources of major atmospheric air pollutants.¹⁵⁹ For example, all lead-acid battery manufacturers are required to apply for and receive a license in order to operate.¹⁶⁰

Discharge fees attach to any stationary source that emits pollutants into the atmosphere.¹⁶¹ The amount of the fee is determined in accordance with the categories and quantities of the pollutants discharged.¹⁶²

¹⁵¹ *Id.*

¹⁵² *Id.*

¹⁵³ *Id.*

¹⁵⁴ *Id.* at art. 46.

¹⁵⁵ *Id.* at art. 65.

¹⁵⁶ *Id.* at art. 22.

¹⁵⁷ *Id.* at art. 21.

¹⁵⁸ *Id.*

¹⁵⁹ *Id.* at art. 15 (Local People’s Governments “shall check and approve the total emission of major air pollutants by enterprises and institutions and issue them licenses for emission of major air pollutants.”).

¹⁶⁰ <http://cw.bjtsb.gov.cn/infoview.asp?ViewID=3974>.

¹⁶¹ PCAP, *supra* note 136, at arts. 13, 14, 24.

The 1995 amendments generally require the State to “eliminate backward production techniques and equipment that seriously pollutes [sic] the atmospheric environment.”¹⁶³ Stationary sources must “give priority to the adoption of clean production techniques” by transitioning away from certain equipment that seriously pollutes the environment.¹⁶⁴

The 2000 amendments stipulate rather vaguely that the State should take “measures,” which the law leaves undefined, “to control or gradually reduce, in a planned way, the total amount of the main atmospheric pollutants discharged in local areas.”¹⁶⁵

2) Implementing Regulations

There are numerous administrative regulations that affect how stationary sources of atmospheric lead emissions may operate in China. The State Council enacts these regulations, also known as ordinances, rules, and measures, in accordance with national legislation such as PCAP.¹⁶⁶ The State Council regulations in turn guide and bind “local governments in their formulation of local rules and regulations”¹⁶⁷

Detailed rules control how lead-acid battery plants may comply with the licenses issued to them by the State. Regulations require lead-acid battery plants to have pollution treatment facilities for lead dust, and the regulations require the plants to collect the dust in accordance with prescribed methods.¹⁶⁸ Additionally, facilities must undergo EPB-conducted monitoring and on-site inspections, as discussed above, and face license revocation in the event the EPB finds a violation.¹⁶⁹

¹⁶² *Id.* at arts. 13, 14, 24.

¹⁶³ *Id.* at art. 19.

¹⁶⁴ *Id.*

¹⁶⁵ *Id.* at art. 3.

¹⁶⁶ McElwee, *supra* note 135, at 78

¹⁶⁷ Creation of Regulations by the State Council and Its Departments, CHINA THROUGH A LENS, <http://www.china.org.cn/english/kuaixun/76340.htm>.

¹⁶⁸ “血铅事件”拷问社会责任(May 3, 2011), http://www.chinasych.com/html/2011/market_0503/4991_3.html.

¹⁶⁹ 于同双: “铅蓄电池的回收和环保进程”, 载《资源再生》2009年第1期第18页.

Industry “access conditions” also serve an important regulatory function by restricting the operation of certain stationary point sources of atmospheric lead emissions. With respect to the lead-zinc smelting industry, production capacity thresholds exist for existing enterprises (10,000 tons/year), rebuilt or expanded enterprises (20,000 tons/year) and newly-built lead enterprises (50,000 tons/year).¹⁷⁰ The conditions also encourage elimination of obsolete lead smelting technology and equipment and require high lead recovery rates.¹⁷¹

The access conditions governing the lead-acid battery industry stipulate that newly-added and existing production capacity for lead-acid battery plants must exceed 500,000 and 200,000 kVAh, respectively.¹⁷² In addition, the conditions impose requirements regarding corporate structure, production capacity, environmental protection, and supervision and management, among other things.¹⁷³

Finally, access conditions govern the secondary lead processing industry.¹⁷⁴ Site selection for secondary lead projects must be consistent with air pollution prevention and control laws.¹⁷⁵ Additionally, newly established secondary lead projects must produce more than 50,000 tons per year, and any facilities producing less than 10,000 tons shall be eliminated.¹⁷⁶ Any

¹⁷⁰ National Development and Reform Commission, No. 13 Announcement (Mar. 6, 2007), http://info.hktdc.com/report/indprof/indprof_070502.htm.

¹⁷¹ *Id.*

¹⁷² Yvonne Huang, China Rectifies Chaos in Lead Acid Battery Industry (Jan. 11, 2013), <http://chemlinked.com/en/news/chemical-news/china-rectifies-chaos-lead-acid-battery-industry>; Lead-Acid Battery Industry Access Conditions, <http://www.miit.gov.cn/n11293472/n11293832/n11293907/n11368223/15064962.html> (effective July 1, 2012).

¹⁷³ Lead-Acid Battery Industry Access Conditions, <http://www.miit.gov.cn/n11293472/n11293832/n11293907/n11368223/15064962.html> (effective July 1, 2012).

¹⁷⁴ MIIT and MEP Jointly Promulgate the Secondary Lead Industry Access Conditions, LEXISNEXIS, https://hk.lexiscn.com/latest_message.php?access=show_detail&id=72264.

¹⁷⁵ *Id.*

¹⁷⁶ *Id.*

facility producing less than 30,000 tons must be shut down by the end of 2013.¹⁷⁷ The conditions explicitly encourage expansion.¹⁷⁸

3) Standards

Aside from laws and regulations, “standards may be promulgated to govern specific, technical, or complex compliance areas.”¹⁷⁹ In the Chinese legal system, “[s]tandards are frequently used . . . to define and help achieve or protect a quantifiable level of environmental quality.” “GB” standards are mandatory, and “GB/T” standards are voluntary.¹⁸⁰ “HJ” standards are mandatory, national standards issued by MEP. “HJ/T” standards are national, voluntary standards issued by MEP.¹⁸¹

As previously discussed, MEP promulgates the national ambient air quality standard (“Air Quality Standard”). The Air Quality Standard imposes a maximum quarterly and annual average concentration of lead.¹⁸² The standard “divides China’s air shed into three zones of air quality based on their current air quality, designated uses, and the applicable protection objectives.”¹⁸³ The standard is currently the same for all zones.¹⁸⁴ It imposes a 1.50 $\mu\text{g}/\text{m}^3$ quarterly average and 1.00 $\mu\text{g}/\text{m}^3$ annual average.¹⁸⁵

The future Air Quality Standard goes into effect in 2016.¹⁸⁶ It merges the second and third grade zones together and stipulates the following maximum lead concentrations for each

¹⁷⁷ *Id.*

¹⁷⁸ *Id.*

¹⁷⁹ McElwee, *supra* note 135, at 105,

¹⁸⁰ *Id.*

¹⁸¹ *Id.*

¹⁸² GB 3095-1996.

¹⁸³ McElwee, *supra* note 135, at 155.

¹⁸⁴ Type 1: nature reserves, scenic areas, other areas requiring special protection; Type 2: mixed residential, mixed commercial, ordinary industrial zones, transportation, cultural, and rural zones; Type 3: special industrial zones

¹⁸⁵ GB 3095-1996.

¹⁸⁶ GB 3095-2012 (second and third grade zones were merged into one “second grade zone”).

zone: in Type 1 zones: 1.00 $\mu\text{g}/\text{m}^3$ quarterly average, 0.50 $\mu\text{g}/\text{m}^3$ annual average; in Type 2 zones: 1.00 $\mu\text{g}/\text{m}^3$ quarterly average, 0.50 $\mu\text{g}/\text{m}^3$ annual average.¹⁸⁷

The Integrated Emission Standards of Air Pollutants “is a generally applicable set of national discharge limits.”¹⁸⁸ With respect to atmospheric lead emissions, it specifies maximum permissible emission rates and concentrations; the rates vary depending on the height of the stack and where the factory is located.¹⁸⁹ In addition, “the applicable air emission limits are different based on when a source was placed in operation.”¹⁹⁰ These limits do not supersede industry-specific standards, however.¹⁹¹

An industry-specific standard governs lead-acid battery plants, and it requires a safe distance between residential areas and newly built factories.¹⁹² A “safe” distance hinges on the average velocity of wind in the area over the past five years:

Required distance from residential zones	Factory’s scale of production (kVA)	Average velocity of wind over past five years (meters/second)		
		<2	2-4	>4
	<100,000	600	400	300
	\geq 100,000	800	500	400

This standard was recently enforced in Anhui province, where local authorities shut down a lead-acid battery plant that was operating too close to the local community.¹⁹³

¹⁸⁷ *Id.* (second and third grade zones were merged into one “second grade zone”).

¹⁸⁸ *Id.* at 157 (2011).

¹⁸⁹ GB 16297-1996.

¹⁹⁰ McElwee, *supra* note 135, at 157.

¹⁹¹ GB 16297-1996.

¹⁹² GB 11659-89.

¹⁹³ He Dan and Zhang Yue, *Polluting battery plant closed*, CHINA DAILY (Apr. 24, 2013), http://www.chinadaily.com.cn/cndy/2011-01/07/content_11805701.htm (“Borui Battery Co Ltd, which is separated from Xinshan community only by a narrow road, produced excessive lead pollution that put local children’s health at risk, the Huaining county government said in a press release. . . China’s environmental protection authorities demand that no battery plant be built within a radius of 500 meters from residential communities.”).

There is also an industry-specific standard for atmospheric lead emissions discharged in connection with the lead and zinc industries.¹⁹⁴ Newly constructed lead and zinc smelting facilities are bound by a maximum emission density of atmospheric pollutants of 8 µg/m³.¹⁹⁵ On December 31, 2012, currently existing factories cannot have a maximum emission density of atmospheric pollutants that is greater than 10 µg/m³.¹⁹⁶ As stated previously, to the extent industry-specific standards exist, they replace the standards imposed by the Integrated Emission Standards of Air Pollutants.

4) Private Lawsuits: Case Studies

Private lawsuits brought by citizens against stationary point sources of atmospheric lead emissions have not resulted in the outcomes one would expect given the extent of the harm suffered. There are two particularly interesting case studies of lawsuits filed by lead poisoning victims seeking compensation from a lead-acid battery manufacturer (Johnson Controls) and a nonferrous smelting facility (Hui County Non-ferrous Metal Smelting Company). In both cases, the victims consulted with the Center for Legal Assistance to Pollution Victims (CLAPV). The Johnson Controls case is still pending, and the Hui County case resulted in a modest settlement for the victims.

The first case occurred in the Kangqiao neighborhood in Shanghai, in which “[t]he government . . . discovered excessive lead-exposure in 49 children . . . during routine back-to-school testing.”¹⁹⁷ An inspection by the Shanghai Municipal EPB preliminarily concluded that the poisoning may be connected with two industrial facilities not far from where the children

¹⁹⁴ GB 25466-2010.

¹⁹⁵ *Id.*

¹⁹⁶ *Id.*

¹⁹⁷ James T. Areddy, *Shanghai Halts Johnson Controls Lead Processing*, WALL STREET JOURNAL (Feb. 28, 2012), <http://online.wsj.com/article/SB10001424052970204653604577248640436283030.html>.

live.¹⁹⁸ One of the facilities was Johnson Controls International Battery Company (Johnson Controls), the world's largest lead-acid battery enterprise.¹⁹⁹ The EPB issued a notice to Johnson Controls ordering it to suspend production.²⁰⁰ The other stationary source, Shanghai Bright Source Auto Parts Co., was also ordered to suspend production.²⁰¹

In October 2011, the victims turned to CLAPV for legal assistance. They sought compensation for their injuries and wished to file a lawsuit to discontinue the enterprises' production in order to completely eliminate atmospheric lead emissions in the area.²⁰² Two CLAPV lawyers were sent to Kangqiao, located just 700 meters from the battery factory, to fully understand the facts and circumstances surrounding the alleged poisoning.²⁰³ They noted the wind direction and velocity in the area.²⁰⁴ The lawyers then informed the victims of the breadth of preparation involved in filing such a lawsuit, which requires information disclosure and the collection of evidence.²⁰⁵

In late February 2012, the Shanghai Municipal EPB asserted, in an official summary of its findings, that Johnson Controls was responsible for the emissions that caused the lead poisoning incident.²⁰⁶ Specifically, the EPB stated: "There is an obvious link between the excessive lead in those children's blood in the Kangqiao area and the lead emission by Johnson

¹⁹⁸ *Id.*

¹⁹⁹ Johnson Controls Power Solutions, Company Profile, <http://www.johnsoncontrols.com/content/dam/WWW/jci/corporate/investors/2012/Baird%20conference%202012--Johnson%20Controls.pdf> (stating that Johnson Controls holds a 36% global market share in the industry).

²⁰⁰ *Johnson Controls, Shanghai at odds over lead report*, THE ASSOCIATED PRESS (Feb. 27, 2012), <http://www.jonline.com/business/johnson-controls-shanghai-at-odds-over-lead-report-284bmai-140573943.html>.

²⁰¹ 浦东康桥地区涉铅企业已被责令停产, <http://www.sepb.gov.cn/fa/cms/shhj//shhj2053/shhj2059/2011/09/40529.htm>.

²⁰² Interview with CLAPV lawyer, Fall 2012.

²⁰³ Shi Jing, *Plant: Closure due to quota, not pollution*, CHINA DAILY (Sept. 20, 2011), http://www.chinadaily.com.cn/china/2011-09/20/content_13737309.htm.

²⁰⁴ Interview with CLAPV lawyer, Fall 2012.

²⁰⁵ *Id.*

²⁰⁶ *Shanghai announces Kangqiao child lead poisoning findings* (Feb. 26, 2012), <http://www.shanghai.gov.cn/shanghai/node2314/node2315/node4411/u21ai586084.html>.

Controls.”²⁰⁷ Johnson Controls, however, has denied violating any laws.²⁰⁸ The corporation issued a statement to the public denying allegations that the company contributed to the poisoning of the children and asserting that it abides by the laws of the PRC, including the prescribed lead emissions standard.²⁰⁹ The president of Johnson Controls insisted that the shut-down order stemmed from the government’s desire to relocate polluting factories outside the city.²¹⁰ Indeed, Johnson Controls has redirected the manufacturing capacity of the Shanghai factory to its other facilities throughout the country.²¹¹

On March 28, 2012, five victims filed official complaints with the court.²¹² According to one plaintiff, the court issued subpoenas in April 2012.²¹³ The filing of future claims depends on whether these five claims succeed in court or not.²¹⁴

The second case occurred in 2006 in Gansu Province and involved more than 350 people with high blood lead levels.²¹⁵ “[A] joint state and local environmental investigation team” found that the Hui County Non-ferrous Metal Smelting Company (known locally as “Hongyu”) was “the major source of the lead pollution” and that it had been using outdated technology

²⁰⁷ Areddy, *supra* note 197.

²⁰⁸ 上海公布康桥地区儿童血铅超标事件调查结果, <http://shanghai.xinmin.cn/xmsz/2012/02/25/13793176.html>.
上海公布康桥血铅超标事件调查结果着手开展受污染土壤修复工作, <http://www.envir.gov.cn/info/2012/2/227988.htm>.

²⁰⁹ 全球最具商业道德企业或陷儿童血铅超标事件诉讼, <http://money.163.com/12/0410/03/7UMTTKS4002524SO.html>.

²¹⁰ *Johnson Controls, Shanghai at odds over lead report*, *supra* note 200 (Alex Molinaroli, president of Johnson Controls Power Solutions: “All I can tell you is that there are some things in the report that don’t make any sense. . . . Certainly it’s very difficult to understand what they based the decision on, other than their desire that we relocate. I don’t understand what’s driving these decisions.”).

²¹¹ *Johnson Controls agrees to withdraw lead-processing operations from its Shanghai battery plant*, PR NEWSWIRE (Sept. 24, 2012), <http://www.prnewswire.com/news-releases/johnson-controls-agrees-to-withdraw-lead-processing-operations-from-its-shanghai-battery-plant-170961741.html>.

²¹² Interview with CLAPV lawyer, Fall 2012.

²¹³ *Id.*

²¹⁴ 全球最具商业道德企业或陷儿童血铅超标事件诉讼, <http://money.163.com/12/0410/03/7UMTTKS4002524SO.html>

²¹⁵ Kevin Huang, *Demolition team goes to work on polluting Gansu smelter*, South China Morning Post (Sept. 10, 2006), <http://www.scmp.com/article/563513/demolition-team-goes-work-polluting-gansu-smelter>.

banned by the State.²¹⁶ The investigation team believes that the factory emitted the lead in secret since villagers testified that “the factory emitted black fumes every day after dark.”²¹⁷ Hongyu also failed “to undertake an environmental impact assessment when it expanded production in 2004.”²¹⁸ Hongyu was subsequently shut down in August 2006 following a protest by the local community.²¹⁹ The dangerous lead emissions from the 170-employee factory, according to villagers, “had been ignored by officials for years.”²²⁰ In 2007, individuals affected by the emissions turned to CLAPV and other law firms for legal assistance. In July 2009, a local county court approved the plaintiffs’ right to file a lawsuit seeking compensation from Hongyu.²²¹ The complaint, which involved more than 700 individual plaintiffs, was permitted by the basic people’s court.²²²

Meanwhile, the local government sold Hongyu’s assets after it was shut down and received \$8M RMB; however, many of the victims privately doubted that this money was used for pollution abatement and medical treatment.²²³ An August 2010 pre-trial mediation between Hongyu and the plaintiffs resulted in no agreement; the defendant’s offer was far less than the plaintiffs’ claim.²²⁴ On June 28, 2011, after a court-imposed mediation, defendant Hongyu agreed to a nine million RMB settlement with the plaintiffs.²²⁵ 1,500 victims with blood lead

²¹⁶ *Id.*

²¹⁷ *Id.*

²¹⁸ *Id.*

²¹⁹ *Id.*

²²⁰ *Id.*; *Smelting Plant Confirmed as Lead Poisoning Source*, CHINA DAILY (Sept. 12, 2006)

(http://www.china.org.cn/government/local_governments/2006-09/12/content_1180817.htm (“However, local farmers claimed the plant had been in operation for some 10 years and that they had reported the pollution on many occasions. ‘They paid no attention,’ said Zhou Yongjie, a farmer living in the Xinsi, whose son is suffering from lead poisoning.”)).

²²¹ Interview with CLAPV lawyer, Fall 2012.

²²² 环境污染案与公益诉讼_专题报道之一甘肃徽县八百村民状告铅污染, 载《民主与法制》2010年第13期.

²²³ Interview with CLAPV lawyer, Fall 2012.

²²⁴ Interview with CLAPV lawyer, Fall 2012.

²²⁵ *Id.*

levels higher than the prescribed standard received 300 RMB each as compensation.²²⁶

Additionally, Hongyu issued apology letters in public to members of the affected community.²²⁷

5) Public Interest Lawsuits

Although public interest lawsuits are now officially allowed in China, it is too early to conclude that this will serve as an effective deterrent to pollution or solution for remedying harm. In August 2012, the 28th Session of the Standing Committee of the 11th National People's Congress adopted an amendment to the Civil Procedure Law of the People's Republic of China allowing public interest lawsuits.²²⁸ It is the first time that public interest lawsuits have been explicitly stipulated in the law and reflects China's great progress with respect to environmental protection. There are problems with the amendment, however. First, it is unclear whether MEP, EPBs, the procuratorate, or other governmental entities qualify as "relevant bodies and organizations" entitled to bring public interest lawsuits.²²⁹ Second, it is also unclear whether non-profit organizations, non-governmental organizations or other organizations have standing to bring such suits. Another fact that detracts from the force of this amendment is that individual citizens are not entitled to file public interest lawsuits; such a right is considered an "abuse of litigation."²³⁰

6) Recent Events Culminating in Mass Plant Closure

²²⁶ *Id.*

²²⁷ "甘肃徽县三千余名铅中毒受害村民获赔偿", 载《民主与法制》2011年第15期.

²²⁸ Civil Procedure Law of the People's Republic of China (2013), art. 55 ("Relevant bodies and organizations prescribed by the law may bring a suit to the people's court against such acts as environmental pollution, harm of the consumer's legitimate interests and rights and other acts that undermine the public interest.").

²²⁹ 别涛;王灿发;蔡彦敏;祝好师;廖荣辉;李和仁;孙永生;赵勇伟;"检察机关能否提起环境民事公益诉讼",载:《人民检察》2009年第07期; see also *China Environment Forum Hosts Event on Environmental Public Interest Law*, Wilson Center (Nov. 29, 2012), <http://www.wilsoncenter.org/article/event-environmental-public-interest-law-china>.

²³⁰ 孙佑海: "制度破冰 环境公益诉讼师出有名", 载《人民网(天津视窗)》<http://www.022net.com/2012/9-6/432253163086356-3.html> (stating that abuse of litigation stemming from the right to bring public interest lawsuits is now a worldwide problem).

Late summer 2009 saw a particularly violent outburst in response to poisoning of hundreds of residents living near a lead smelter in Shaanxi province. After more than 600 children were diagnosed with lead poisoning, outraged residents stormed the Dongling Town Lead and Zinc Smelting factory, smashed vehicles, and damaged other company property.²³¹ Their actions brought national attention to the community and “spurred local officials to accelerate their plans for relocating nearly 1,500 families from the grounds affected by the smelting operation.”²³² The smelter continues to operate,²³³ and although the company paid the victims’ medical bills, victims “say little has been discussed about compensating them for their poisoned land and their lost livelihoods.”²³⁴

The Chinese government could not ignore mass poisoning incidents like the one in Shaanxi forever. In February 2011, it published the Twelfth Five-Year Plan on the Prevention and Control of Heavy Metal Pollution. The Plan stressed better enforcement of environmental regulations governing heavy metal pollution, and it specifically mentioned the lead smelting and lead-acid battery industries as being particularly destructive to the environment and human health.²³⁵ Wu Yixiu, a Greenpeace campaigner, classified the Plan “as the toughest measures taken by the Chinese government to address heavy metal pollution.”²³⁶

One month later, nine ministries and commissions held a joint television conference call to the nation, called the Special Action Notice, during which they discussed new regulations and

²³¹ Dodson, *supra* note 61.

²³² *Id.*

²³³ Polly Yam, *China Dongling to reopen lead/zinc plant this month*, REUTERS (Mar. 12, 2010), <http://in.reuters.com/article/2010/03/12/china-lead-idINTOE62B05H20100312>.

²³⁴ Dodson, *supra* note 61.

²³⁵ Zhou Shengxian Stresses the Need to Fight Against Heavy Metal Pollution, Safeguard the Public Interests and Maintain Social Stability, Ministry of Environmental Protection (Feb. 21, 2011), http://english.sepa.gov.cn/Ministers/Activities/201102/t20110223_201084.htm.

²³⁶ Natasha Khan, *Johnson Controls Disputes Lead Link as China Battles Pollution*, BLOOMBERG (Feb. 28, 2012), <http://www.bloomberg.com/news/2012-02-28/johnson-controls-disputes-lead-link-as-china-battles-pollution.html>.

enforcement measures governing the lead-acid battery industry.²³⁷ The conference detailed six major initiatives: 1) newly-built, rebuilt, or expanded lead-acid battery factories must abide by EIA requirements or shut down; 2) factories must implement pollution prevention facilities into their operations; 3) those factories with no pollution prevention facilities must shut down; 4) only qualified plants may recycle lead batteries; 5) factories must be located at least 500 meters from residential areas; and 6) violators will be investigated for liability.²³⁸

Notwithstanding the government's proclaimed sense of urgency in dealing with lead poisoning incidents, another explosive outburst of violence in response to poisoning occurred in May 2011. Hundreds of residents broke through the walls of Zhejiang Haiju Battery Factory and destroyed cabinets, desks, and computers.²³⁹ Their rage stemmed from severe lead poisoning of 233 adults and 99 children due to the battery factory operating "for six years despite flagrant environmental violations."²⁴⁰ Local officials were loath to shutdown a factory employing approximately 1000 people.²⁴¹ "The incident opens a window on the rapid change in attitudes in China toward industrialization, pollution, and authority."²⁴²

Also in May 2011, MEP issued a notification to strengthen the control and prevention of pollution from lead-acid battery and secondary lead processing factories.²⁴³ The notification

²³⁷ Nine Departments of the State Council Jointly Hold Teleconference to Deploy 2011 Environmental Protection Special Action Notice, Ministry of Environmental Protection of the People's Republic of China (Mar. 29, 2011), http://www.mep.gov.cn/zhxx/hjyw/201103/t20110329_208000.htm.

²³⁸ *Id.*

²³⁹ Sharon LaFraniere, *Lead Poisoning in China: The Hidden Scourge*, THE NEW YORK TIMES (June 15, 2011), http://www.nytimes.com/2011/06/15/world/asia/15lead.html?_r=1&.

²⁴⁰ *Id.*

²⁴¹ Guidotti, *supra* note 64 ("[Mengxi] caught a wave of increased business demand and now employs a reported 1000 workers, making it an important economic support for rural Deqing County. . . . Mengxi illustrates the problem of local officials refusing to act, denying that the problem exists, and suppressing efforts to find out by journalists or by public health experts.").

²⁴² *Id.*

²⁴³ Lead-acid battery industry information disclosure, 关于铅蓄电池企业信息公开有关情况的通报（环办函[2011]1041号）
http://govinfo.nlc.gov.cn/hbsfz/xxgk/hbsdsj/201111/t20111121_1098841.html?classid=346.

granted authority to EPBs to approve or disapprove plans for construction of lead projects.²⁴⁴ It restated the 500 meter requirement and charged EPBs with generally strengthening their daily management and enforcement of the industries.²⁴⁵ Finally, EPBs must submit a list of all lead-acid battery and secondary lead processing factories to the MEP every six months. This list must include the address, capacity, production technology, and pollutants emitted for each factory.²⁴⁶ On July 31, 2011, a comprehensive list of said factories was published: out of 1930 lead-acid battery and secondary lead enterprises, 583 were forced to close, 610 were forced to halt production, 405 were forced to halt production and renovate, 252 were still in production, and 8 were in the process of being built.²⁴⁷ All in all, more than 80% of them were shutdown.²⁴⁸

In December 2011, the government turned some of its focus to the lead smelting industry by issuing the Twelfth Five-Year Plan on the Nonferrous Metals Industry.²⁴⁹ It proposed key technical reforms relating to lead smelting, catalogued facilities that should be eliminated, and detailed methods to manage heavy metal pollution.²⁵⁰

In June 2012, the MEP compiled all the information from the EPBs and published another list.²⁵¹ It included information stating that there are two pending applications for construction of lead-acid battery plants, Power Technology Co. and Anhui Huifeng New Energy Co.²⁵² There is still no word on whether these two projects have been approved.²⁵³

²⁴⁴ *Id.*

²⁴⁵ *Id.*

²⁴⁶ *Id.*

²⁴⁷ Published List of lead-acid battery enterprises, “各地公布铅蓄电池行业企业名单”, 载《环境保护部>首页>环境要闻》http://www.zhb.gov.cn/zhxx/hjyw/201108/t20110802_215645.htm.

²⁴⁸ More than 80% of lead-acid battery enterprises shutdown or discontinued, Xinhua News (Dec. 23, 2011), 全国八成以上铅蓄电池企业被关闭或停产”, 载《新华网>新华财经>正文, http://news.xinhuanet.com/fortune/2011-12/23/c_122470519.htm.

²⁴⁹ http://www.cnmn.com.cn/uploadfiles/2012015104031326595203000_2927.pdf.

²⁵⁰ *Id.*

²⁵¹ 2012 lead-acid battery production, assembly, and recycling statistics, Ministry of Environmental Protection of the People’s Republic of China (July 10, 2012), http://hj.mep.gov.cn/zdhy/xqdc/201207/t20120710_233290.htm.

²⁵² *Id.*

The State Council and MEP seem to be tackling these mass lead poisoning incidents with substantive measures, and not simply paying the problem lip service as they have in the past. This is encouraging, especially for residents that live near stationary sources of atmospheric lead emissions.²⁵⁴ “[B]ut unless Chinese provincial governments develop planning guidelines which can stop highly-polluting battery manufacturers from setting up somewhere else tomorrow, then it’s not good news for the Chinese population in general.”²⁵⁵ Local people’s governments (LPGs) fund local EPBs, which have the most responsibility for ensuring stationary sources of atmospheric lead emissions comply with China’s environmental laws.²⁵⁶ This dependency dynamic compels EPBs to ignore violations of national laws when they conflict with the economic goals of LPGs.²⁵⁷ These goals, which often include unbridled economic development, steady tax revenues, and steady employment,²⁵⁸ are accomplished in many parts of China through the unregulated operation of dirty lead-acid battery factories and smelters.

V. RECOMMENDATIONS

Our recommendations take two forms: one, legislative and judicial responses, and two, general initiatives.

A. *Legislative and Judicial Responses*

First, we recommend the Ministry of Health draft legislation designed specifically to reduce total atmospheric lead emissions from stationary sources and the effects of such

²⁵³ Confirmation of Receipt of EIA of Power Technology Co., Ltd. Lead-Acid Battery Project, Environmental Protection Bureau of Anhui Province (April 1, 2012), http://www.aepb.gov.cn/pages/Aepb11_ShowNews.aspx?NewsID=68993; Confirmation of Receipt of EIA of Anhui Huifeng New Energy Co., Ltd. Lead-Acid Battery Project, Environmental Protection Bureau of Anhui Province (July 20, 2011), http://www.aepb.gov.cn/pages/Aepb11_ShowNews.aspx?NewsID=64686.

²⁵⁴ Personal Comment by Elizabeth O’Brien, 2011, <http://www.lead.org.au/lanv11n3/lanv11n3-6.html>.

²⁵⁵ *Id.*

²⁵⁶ *See* Environmental Protection Law, art. 16 (“The local people’s governments at various levels shall be responsible for the environmental quality of areas under their jurisdiction and take measures to improve the environmental quality.”); McElwee, *supra* note 135, at 113.

²⁵⁷ McElwee, *supra* note 135, at 6.

²⁵⁸ *Id.*

emissions on local communities. This legislation should be enacted by the full NPC or the NPC Standing Committee and will require “local rules” to implement the law. LPGs “enact ‘local rules’ in accordance with national law . . . [and local rules] can take the form of enactments required to implement national laws, administrative regulations, or local decrees or may address matters that are within the regulatory scope of the local jurisdiction.”²⁵⁹ The law and the local implementing rules should impose on local EPBs a real enforcement responsibility with respect to lead smelters and battery plants, in much the same way EPA imposes on individual states the responsibility to submit SIPs demonstrating how they will transition to complying with NAAQS. Additionally, the law could provide guidance to hospitals in how to treat lead poisoning.

Second, we urge the Supreme People’s Court to issue a Judicial Interpretation (JI) clarifying which entities may bring lawsuits on behalf of the public interest under Article 55 of the Civil Procedure Law. Specifically, we advocate for a JI that permits MEP, NGOs, and non-profit organizations to bring such lawsuits. As discussed previously, article 55 is ambiguous as to what bodies are entitled to sue on the public’s behalf. We believe a dispositive JI will transform the public interest lawsuit from a weak and underutilized enforcement tool to a powerful means of ensuring lead poisoning victims receive fair compensation and of deterring factories from continuing to violate the law.

B. Initiatives

Finally, we recommend five general initiatives to strengthen enforcement of the laws governing stationary sources of atmospheric lead emissions and to protect public health.

First, MEP must provide greater financial support to local EPBs for the purpose of ensuring human health. Currently, EPBs receive most of their funding from LPGs, creating a

²⁵⁹ *Id.* at 112.

dependency that incentivizes EPBs to ignore violations if they conflict with local policies.²⁶⁰

With MEP funds, local EPBs could reward factories that adhere to the emissions standards.

Additionally, EPBs could use the funds to grant loans to smelters or lead-acid battery plants who would like to install better pollution control equipment.

Second, local residents must be encouraged to supply the media and EPBs with evidence and other information concerning emissions violations. A widespread problem in China is that complaints more often than not lack the required evidence for acceptance by the judiciary.

Historically, local populations have been reluctant to speak to the media about environmental problems. “Many of [the hundreds of millions of Chinese peasants] have adopted the “what can I do?” attitude . . . and resigned themselves to what they view as an inevitable trade-off between economic progress and environmental protection.”²⁶¹ Many lawsuits with potential merit have not even made it to the courtroom due to insufficient evidence.

Third, China must put environmental tribunals to work. It is unnecessarily difficult for plaintiffs to get their lawsuits accepted by environmental courts because the required burden of proof regarding causation is so onerous. Courts should lower this burden to allow plaintiffs to be heard on a more widespread basis.

Fourth, China should increase general, societal awareness of and education regarding environmental problems and how these problems are connected with human health. “Factories enjoy setting up in the countryside because of the ignorance of local residents in matters of chemistry, health, and the environment.”²⁶²

²⁶⁰ *Id.* at 6,

²⁶¹ *Id.* at 30.

²⁶² Dodson, *supra* note 61.

Finally, MEP should establish a fund for pollution victims. Specifically, the funds should be collected from factories found to be in violation of the law, and the funds should be used to cover victims' hospital expenses and treatment.