CHINA'S "GREEN LEAP FORWARD" TOWARD GLOBAL ENVIRONMENTAL LEADERSHIP

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TABLE OF CONTENTS

INTRODUCTION

More than half a century ago, the People's Republic of China sought to vault itself into the industrial world through Chairman Mao Zedong's Second Five Year Plan, which became known as the "Great Leap Forward."[1] Mao's policies, which have been described as a "War Against Nature,"[2] proved disastrous for both China's environment and economy. But during the last three decades, China has become a global superpower as its economy has surged in response to market reforms championed by Deng

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1. JUDITH SHAPIRO, MAO'S WAR AGAINST NATURE: POLITICS AND THE ENVIRONMENT IN REVOLUTIONARY CHINA 2 (2001).

2. *Id.* at 8, 69.

Xiaoping.[3] The economic reforms instituted in 1979 have contributed to a remarkable surge in economic growth that has made China's economy the second largest in the world.[4] But the country's spectacular economic growth has taken a heavy toll on the Chinese environment by generating horrendous air and water pollution that has become a severe threat to public health in many areas of the country.[5]

In response to growing public concern over public health and the environment, the Chinese government has made the development of national environmental law an urgent priority. Yet, until recently, global warming and climate change have not been among the top issues of concern to Chinese officials. In 2006, China passed the United States as the world's largest emitter of greenhouse gases (GHGs), though in per-capita terms its emissions are still only one-third of those originating in the United States.[6] Because China is now the country with the greatest impact on the future of the planet's environment, it is critical that the country adopt, implement, and enforce policies to control its rampant pollution.

Fortunately, there are signs of a dramatic improvement in environmental consciousness in China in recent years. Since the beginning of 2010, there appears to have been a discernible shift in the attitude of the Chinese government toward climate change. Two years ago when the U.S. State Department's Office of Public Diplomacy and Public Affairs sent me on a lecture tour of China, I frequently encountered strong pushback when arguing that climate change was an urgent problem that made it important

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3. Benjamin J. Richardson, *Is East Asia Industrializing Too Quickly? Environmental Regulation in its Special Economic Zones*, 22 UCLA PAC. BASIN L.J. 150, 168 (2004).

4. It is estimated that China's gross national product surpassed that of Japan by the end of 2010. Japan's economy was estimated to be worth $5.4674 trillion, while China's was closer to $5.8 trillion. *China Overtakes Japan as World's Second-Biggest Economy*, BBC NEWS (Feb. 14, 2011), http://www.bbc.co.uk/news/business-12427321.

5. The World Health Organization (WHO) estimated that air pollution in China results in the premature deaths of 656,000 Chinese each year. Kevin Holden Platt, *Chinese Air Pollution Deadliest in World, Report Says*, NATIONAL GEOGRAPHIC NEWS, July 9, 2007, http://news.nationalgeographic.com/news/2007/07/070709-china-pollution.html. China's drinking water supply is not safe—even in the luxury hotels of Beijing. In June 2010 the Chinese Ministry of Environmental Protection released an environmental protection plan aimed at ensuring the safety of urban drinking water. *The First Environmental Protection Plan for Drinking Water Sources in China Issued to Guarantee Safe Drinking Water for Urban Areas and Safeguard the Public Health*, MINISTRY OF ENVIRONMENTAL PROTECTION, THE PEOPLE'S REPUBLIC OF CHINA (June 11, 2010), http://english.mep.gov.cn/News_service/news_release/201007/t20100707_191853.htm.

6. Brad Knickerbocker, *China Now World's Biggest Greenhouse Gas Emitter*, CHRISTIAN SCIENCE MONITOR, June 28, 2007, http://www.csmonitor.com/2007/0628/p12s01-wogi.html (reporting estimates by the Netherlands Environmental Assessment Agency that China's greenhouse gas (GHG) emissions were eight percent greater than those of the United States in 2006).

for China to control its GHG emissions. A professor in the audience following my lecture at the Dalian Academy of Sciences argued: (1) that climate change was not real; (2) that if climate change was real, it was not caused by humans; and (3) that if climate change was caused by humans, China already was doing enough in response. Even prominent Chinese environmental advocates privately expressed their skepticism to me about the importance of the climate change problem.

One year later, I was invited to speak at a conference at Renmin University in Beijing on "Climate Change Legislation and the Transition to a Low Carbon Economy." A principal issue discussed at the conference was whether China should use its existing environmental laws to control GHG emissions or adopt special legislation to accomplish this important goal. While resisting international pressure to commit to reducing its total GHG emissions, China has established a goal of reducing the carbon intensity of its economy by forty percent below 2005 levels by the year 2020.[7]

This article argues that China may be on the verge of a "Green Leap Forward" that could make it a global environmental leader.[8] This article argues that two principal forces have contributed to this development. First, Chinese officials now realize that a global shift away from fossil fuels will create enormous business opportunities on a global scale. Chinese companies are now making enormous strides in the development of green technology, such as solar power, wind energy, and electric cars, with the active assistance of the Chinese government. Second, realizing that climate change severely threatens China, and stung by the criticism it received for its stance during the December 2009 Copenhagen conference, the Chinese government now realizes that it must play a more constructive global leadership role on environmental issues. Thus, it has joined the process established by the Copenhagen Accord by pledging to reduce the carbon intensity of its economic growth.[9] China now has the opportunity to become

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7. Hu Angang, *Green Light for Hard Targets*, CHINADAILY, Mar. 28, 2011, http://europe.chinadaily.com.cn/opinion/2011-03/28/content_12235623.htm.

8. This term has been used frequently in recent years to describe China's investment in green technology, most prominently by columnist Thomas Friedman, who has argued that "that when historians look back at the end of the first decade of the 21st century, they will say that the most important thing to happen was not the Great Recession, but China's Green Leap Forward." Thomas L. Friedman, *Who's Sleeping Now?*, N.Y. TIMES, Jan. 9, 2010, http://www.nytimes.com/2010/01/10/opinion/10friedman.html?_r=1.

9. U.N. Framework Convention on Climate Change, Report of the Conference of the Parties on its fifteenth session, held in Copenhagen from 7 to 19 December 2009: Addendum, Copenhagen Accord, U.N. Doc. FCCC/CP/2009/11/Add.1 (Mar. 30, 2010); Letter from SU Wei, Dir. Gen., Dep't of Climate Change, Nat'l Dev. & Reform Comm'n of China, to Yvo de Boer, Exec. Sec'y, United Nations

a true leader on global environmental issues as its leadership begins to grasp the economic advantages of developing green technology.

This article begins by reminding the reader of how far China has come from the days of Mao Zedong's "War Against Nature." It then highlights several developments that suggest that China is making a "Green Leap Forward," including its emphasis on developing renewable energy technologies, its creation of environmental courts, and the integration of environmental protection objectives in the country's latest Five Year Plan (FYP). However, this article cautions that China's environmental record is tarnished by the country's growing use of asbestos, a highly dangerous substance that has been banned entirely in most developed countries.

I. CHAIRMAN MAO'S "WAR AGAINST NATURE"

China's revolutionary leader Mao Zedong reigned over the People's Republic of China from its founding in 1949 until his death in 1976.[10] During this period, China's population grew from 550 million to more than 900 million despite the government's disastrous "Great Leap Forward" from 1958 to 1961 and the "Cultural Revolution" from 1966–1976.[11] Often forgotten in the focus on the immense human toll of these events is what has been described as Chairman Mao's "War Against Nature."[12] Chinese traditions of harmony between man and nature were tossed aside in favor of Mao's edict that "Man Must Conquer Nature."[13] Scientists who warned about environmental destruction were persecuted as disastrous development policies were pursued. [14]

Mao's mass mobilization campaigns resulted in horrendous environmental devastation.[15] The creation of backyard steel mills and

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Framework Convention on Climate Change (Jan. 28, 2010), *available at* http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/chinacphaccord_app2.pdf.

10. Shapiro, *supra* note 1, at 2.

11. *Id.* at 2, 32–33.

12. *Id.* at 8, 17, 19.

13. *Id.* at 8–9, 67.

14. *Id.* at 3–4, 178.

15. *See* Roda Mushkat, *Contextualizing Environmental Human Rights: A Relativist Perspective*, 26 PACE ENVTL. L. REV. 119, 149 (2009) (stating that Mao Dzedong "single-handedly instigated campaigns, such as the anti-rightist drive and the Cultural Revolution, aimed at eradicating pockets of revolutionary lethargy, and insatiable quest for communist utopia, culminating in the Great Leap Forward, left China's institutions and its ecosystem in shambles"). Mao Qu Geping, the first director of China's National Environmental Protection Agency stated that during Mao's reign factories were haphazardly built without consideration for environmental protection, biological resources were seriously damaged, and there was extensive destruction of the natural environment. ELIZABETH

factories, agricultural policies seeking to increase grain yields dramatically, and extensive dam building were among Mao's campaigns that had the most devastating effects on the environment. Finally, Mao's disdain for intellectuals—including scientists—prevented anyone from speaking out against his destructive environmental policies.

Mao's philosophy of conquering nature stemmed from the anthropocentric Confucianism belief that man should exploit natural resources for his own benefit.[16] He took this ancient Chinese concept to the extreme and believed that "'with the power of will, all difficulties could be overcome.'"[17] As early as 1940, Mao announced during a speech at the inaugural meeting of the Natural Science Research Society of the Border Region that man must use natural science to understand, conquer, and change nature, thereby attaining freedom from nature.[18] Mao's campaigns were all based on the assumption that natural constraints could be circumvented by human ingenuity.[19]

Mao's attempt to surpass the industrial achievements of the West by increasing iron and steel production was the first of his destructive campaigns against the environment.[20] During the Great Leap Forward, primitive steel mills were established throughout the country.[21] Many of the steel mills were no more than backyard furnaces,[22] thus much of the resulting steel was useless, and severe environmental degradation essentially took place without any gain.[23]

Mao's drive to increase grain production resulted in similarly devastating environmental consequences. Agricultural policies were based

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ECONOMY, THE RIVER RUNS BLACK: THE ENVIRONMENTAL CHALLENGE TO CHINA'S FUTURE 51 (2004) [hereinafter ECONOMY].

16. It is interesting to note the paradox that during his rule, Mao tried to eliminate every aspect of imperial China, including ancient philosophies such as Confucianism. Michelle Yu, *Wu Lihong, Lake Tai, and the Difficulties of Protecting China's Environment: A Case Study*, 21 GEO. INT'L ENVTL. L. REV. 639, 642 (2009).

17. *Id.* (quoting Shapiro, *supra* note 1, at 192).

18. ECONOMY, *supra* note 15, at 48.

19. Roda Mushkat, *Implementing Environmental Law in Transnational Settings: The Chinese Experience*, 18 S. CAL. INTERDISC. L.J. 45, 47 (2008). In addition, Mao believed that environmentalism was a Western plot to suppress China's development. Jonathan B. Wiener, *Climate Change Policy and Policy Change in China*, 55 UCLA L. REV. 1805, 1813 (2008).

20. ECONOMY, *supra* note 15, at 52.

21. Dongsheng Zang, *From Environment to Energy: China's Reconceptualization of Climate Change*, 27 WIS. INT'L L.J. 543, 548 n.23 (2009).

22. ECONOMY, *supra* note 15, at 52.

23. Zang, *supra* note 21.

on "dogmatism, literalism, and formalism born of zeal and fear."[24] "Anyone deviating even slightly from the Maoist production model based on the indiscriminate transformation of the natural landscape to increase grain yields was subject to attack and exile."[25] Total deforestation was encouraged to facilitate agricultural crops.[26] In addition, the Chinese people were encouraged to eliminate the "four pests" (rats, sparrows, flies, and mosquitoes), and utilize new methods of raising grain yields, including close planting of seeds, deep plowing, and extensive use of damaging fertilizers, tractors, and farm implements.[27]

A massive effort was made to build dams and water reservoirs throughout China.[28] Every county was ordered to construct a water reservoir by building a dam and water channels.[29] This resulted in extensive relocations as well as large dams that were ecologically destructive.[30] Many dams were so poorly constructed that they collapsed in two to three years, leaving behind even more ecological destruction.[31]

To be sure, ignorance of the environmental consequences of human action was widespread throughout the world during the 1950s. For example, the Hooker Chemical Company was dumping untreated industrial toxins into the ground at Love Canal until 1953 when it transferred the property to the Niagara Falls City School District for construction of schools and homes.[32] But Mao's deep disdain for intellectuals, including scientists, prevented any serious consideration of scientific warnings about the environmental consequences of Mao's policies.[33] One estimate is that 53,000 scientists and technicians were persecuted and falsely charged with

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24. Srini Sitaraman, *Regulating the Belching Dragon: Rule of Law, Politics of Enforcement, and Pollution Prevention in Post-Mao Industrial China*, 18 COLO. J. INT'L ENVTL. L. & POL'Y 267, 285–86 (2007).

25. *Id.* at 286.

26. John Copeland Nagle, *The Effectiveness of Biodiversity Law*, 24 J. LAND USE & ENVTL. L. 203, 216 (2009). "As one villager remembered: When I was a child, there were jackals and foxes in the woods, but after the big trees were cut to fuel furnaces during the [Great Leap Forward], there wasn't even a rabbit . . . we had to cut trees. Whoever cut the most got the most political points, and the most grain." *Id.* at 216–27.

27. ECONOMY, *supra* note 15, at 51–52.

28. Benjamin J. Richardson, *Is East Asia Industrializing Too Quickly? Environmental Regulation in its Special Economic Zones*, 22 UCLA PAC. BASIN L.J. 150, 190 (2004).

29. ECONOMY, *supra* note 15, at 52.

30. An example is the Sanmenxia Dam on the Yellow River. Richardson, *supra* note 28, at 190.

31. ECONOMY, *supra* note 15, at 52.

32. United States v. Hooker Chem. & Plastics Inc., 850 F. Supp. 993, 998 (W.D.N.Y. 1994).

33. Yu, *supra* note 16, at 642.

offenses against the state.[34] The lack of open public policy debate exacerbated China's ecologically unsustainable policies[35] and contributed to ecosystem collapse, which caused widespread famine during the Great Leap Forward.[36]

II. CHINA'S TWENTY-FIRST CENTURY "GREEN LEAP FORWARD"

Although China's "Great Leap Forward" in the late 1950s was both an economic and environmental disaster, there are signs that China is making a "Green Leap Forward" in the first decade of the twenty-first century that will enhance both China's economy and environment. China's central government continues to refine its environmental legislation and to encourage greater transparency to mobilize public involvement in the process of implementing environmental policy. It also has adopted national policies to encourage the rapid development of green energy technology, which the government has promoted so vigorously that it has become the subject of a trade dispute between U.S. unions and the Chinese government.[37]

A. Strengthening Chinese Environmental and Natural Resource Policies

Like many other countries, China's modern environmental consciousness dates from the 1970s. In 1978, Article 26 was added to the Constitution of the People's Republic of China, requiring the government to prevent and control pollution and other public nuisances.[38] During the late 1980s and early 1990s, the National People's Congress (NPC) adopted a series of environmental laws that seek to control air and water pollution and protect the natural environment in a comprehensive fashion.[39] China's central government has promulgated eight major laws for environmental protection, fourteen laws for the management of natural resources, and

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34. THE CAMBRIDGE HISTORY OF CHINA, THE PEOPLE'S REPUBLIC PART 2: REVOLUTIONS WITHIN THE CHINESE REVOLUTION, 1966-1982, at 211–12 (Roderick MacFarquahar & John King Fairbanks eds., 1991).

35. Sitaraman, *supra* note 24, at 286.

36. Yu, *supra* note 16, at 642.

37. See *infra* Part C.

38. Canfa Wang, *Chinese Environmental Law Enforcement: Current Deficiencies and Suggested Reforms*, 8 VT. J. ENVTL. L. 159, 161 (2007).

39. *Id.* at 184–193 (summarizing special legislation adopted for the protection against air pollution and natural resource protection).

more than a hundred national environmental protection regulations.[40] Yet China's heavily decentralized legal system makes it difficult for the central government to enforce these laws. Indeed, there are few centralized national policies, aside from family planning, environmental protection, and, more recently, national energy policy.[41]

In 2008, China elevated its State Environmental Protection Agency (SEPA) to ministry status when it created the Ministry of Environmental Protection (MEP).[42] Despite initial promises that the MEP would acquire clout to compete with the enormously powerful National Development and Reform Commission (NDRC), MEP has remained far less influential in central government policy disputes than the NDRC. With only a few hundred employees (compared to the U.S. EPA's 17,000), MEP has been likened to the tiny U.S. Council on Environmental Quality (CEQ).[43]

In addition to adopting regulatory legislation to protect the environment, China has adopted a "green strategy" to reduce pollution at its source by increasing the efficiency of resource use and encouraging clean production. The Chinese government describes its environmental protection goals as "changing from the down-stream, after-the-event management of the past to today's whole-process supervision and control."[44] The Cleaner Production Promotion Law and the Environmental Impact Assessment Law, which went into effect on January 1 and September 1, 2003, respectively, seek to promote these goals.[45]

The government of China also has acted to prevent deforestation and to increase national forest cover. China's Sustainable Development Strategy on Forestry Research Report states that China's forest coverage rate is expected to reach twenty-eight percent by 2050, with an added area of 110 million hectares of planted forest.[46] The State Forestry Administration has implemented a nationwide desertification control program, which has three phases: the first phase aimed to get basic control of desertification by 2010; the second phase aims then to reduce the area of desertification every year

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40. *Green Strategy*, GOV.CN, http://english.gov.cn/2006-02/08/content_182528.htm (last visited Feb. 20, 2011).

41. *Id.* ("Environmental protection has been a basic national policy since the 1980s.").

42. Robert V. Percival, *The Challenge of Chinese Environmental Law*, 10 INT'L ENVT'L L. COMM. NEWSLETTER 2, 3 (2008), *available at* http://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=1620&context=fac_pubs.

43. *Id.*

44. *Green Strategy*, *supra* note 40.

45. *Id.*

46. *Protection of Forests and Control of Desertification*, GOV.CN, http://english.gov.cn/2006-02/08/content_182514.htm (last visited Feb. 20, 2011).

until 2030; and the third phase aims to raise the nation's forest cover and bring all desertification sources under effective control by the year 2050.[47]

The Chinese government also seeks to prevent degradation of wetland resources. Its National Plan for Wetland Protection Actions, launched in November 2000, aimed to stop human activity from shrinking natural wetlands by 2010, and to restore deteriorated or vanished wetlands by 2020.[48] The National Program for Wetland Protection Engineering, approved by the State Council in 2003, set the following goals:

> by 2030 China will have 713 wetland reserves, including 80 Wetlands of International Importance, with 90 percent of natural wetlands effectively protected; at the same time, 1.4 million [hectares] of wetlands will be restored, and 53 national model zones of wetland protection and proper exploitation will be built, forming a relatively complete system of wetland protection, management and construction.[49]

B. Promoting Greater Environmental Transparency

Given the highly decentralized nature of China's legal system, central government authorities have focused on promoting greater environmental transparency to pressure local authorities to implement national environmental policy. In May 2008, China's new Open Information Law became effective.[50] In addition, Chinese authorities have been encouraging greater voluntary environmental disclosures from multinational corporations.[51] A separate law on Measures for the Disclosure of Environmental Information entered into force on May 1, 2008.[52] The Act encourages multinational companies in China to make their "ecological

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47. *Id.*

48. *Wetland Protection*, GOV.CN, http://english.gov.cn/2006-02/08/content_182511.htm (last visited Feb. 20, 2011).

49. *Id.*

50. *Exposure of Pollution*, CHINADAILY, Apr. 30, 2007, http://www.chinadaily.com.cn/cndy/2007-04/30/content_863884.htm.

51. CSR ASIA, CORPORATE ENVIRONMENTAL REPORTING AND DISCLOSURE IN CHINA 1, 3 (Richard Welford ed., June 2005), *available at* http://www.csr-asia.com/upload/environmentalreporting.pdf.

52. Measures on Open Environmental Information (for Trial Implementation) (adopted by the State Environmental Protection Administration of China, Feb. 8, 2007, effective May 1, 2008) (China), *available at* www.epa.gov/ogc/china/open_environmental.pdf.

footprint" public.[53] The law includes both mandatory and voluntary disclosures.[54] All companies are encouraged to make environmental goals and performance public. Certain heavy polluters are required to disclose their pollutant emissions.[55] China's Institute of Public and Environmental Affairs (IPE) and the U.S.-based Natural Resources Defense Council (NRDC) have established a Pollution Information Transparency Index (PITI) that rates 113 Chinese cities on how well they are implementing the provisions of the Open Information Act.[56] These groups report that, after the first release of the PITI received great publicity throughout China, many local government officials contacted them for advice on how they can improve their ratings in subsequent years.

Despite these measures encouraging greater environmental transparency, it is still difficult for the public to access facility emissions data. For example, citizens in Shanghai fought for three years to obtain access to an environmental impact statement (EIS) for the Baosteel Plant that is located within the city.[57] The Shanghai Environmental Protection Board took the position that because the EIS had been prepared by the company, the citizens could only obtain a copy if the company agreed to release it to them.[58] After losing in the local district court and the Shanghai municipal court, the citizens were finally able to obtain the document three years later due to a mediation that occurred while the case was on appeal to the Supreme People's Court of China.[59] Fortunately, the mediation agreement allowed the plaintiffs to be compensated for all of their litigation expenses.[60]

Yet there are other cases where the Chinese public is rebuffed in its efforts to seek information or redress for harm caused by pollution. In October 2008, families of students exposed to chemical plant fumes brought suit against a local government department for "poorly handling the

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53. *Green Transparency*, CHINADAILY (May 5, 2008), http://www.chinadaily.com.cn/opinion/2008-05/05/content_6660685.htm.

54. *Id.*

55. *Id.*

56. *Pollution Index Up and Running*, CHINADAILY, June 4, 2009, http://www.chinadaily.com.cn/bizchina/2009-06/04/content_8246613.htm.

57. *Green Governance Victories and Ongoing Challenges in China*, WOODROW WILSON INTERNATIONAL CENTER FOR SCHOLARS (Mar. 9, 2011), http://www.wilsoncenter.org/ondemand/index.cfm?fuseaction=home.play&mediaid=C4C4CE07-ED32-2AC2-B5FF0289D02EE798.

58. *Id.*

59. *Id.*

60. *Id.*

incident and dodging their repeated requests for transparency."[61] The poisoning was allegedly caused by the inhalation of fumes from a nearby chemical plant.[62] It lasted for almost a week and led to more than 300 students being hospitalized.[63] "A similar incident previously took place in May 2008 at a primary school in the neighboring village of Beishan, where a dozen students exhibited the same symptoms."[64] Yet the "government's investigation of the poisoning incidents concluded that the students became ill after drinking unsanitary water at school."[65] Even though the families repeatedly requested information over a period of two years, a local primary court and an appeal court rejected the efforts of the families to bring suit.[66]

Also, Chinese government officials started experimenting with soliciting public opinion in advance of adopting regulations. In summer 2010, the Chinese Ministry of Environmental Protection solicited public opinion on a plan for disposal alternatives to incineration.[67] The Ministry planned to establish a household garbage and pollution monitoring system by 2015, in part as a response to a perceived garbage crisis in many Chinese cities, which had spawned public protests of the construction and expansion of incinerators.[68] Commenting on this initiative, Ma Jun, director of the Institute of Public and Environmental Affairs, stated that it was a "positive step for the country's environmental watchdog to integrate public participation into the legislation process."[69] He explained that "[i]n the past, the environmental ministry only sought public opinion for approval of new industrial projects. But this time, (they are doing so) before a regulation is finalized."[70] Zhang Lijun, Vice Minister of Environmental Protection, commented on the role of public opinion, stating that public opinion can help the ministry "make more accurate decisions" in designing new policy tools.[71] "Zhang admitted that the protests on incineration projects were

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61. Bao Daozu, *No Joy for Mass Poisoning Families*, CHINADAILY, Jan. 24, 2011, http://www0.chinadaily.com.cn/china/2011-01/24/content_11902734.htm.

62. *Id.*

63. *Id.*

64. *Id.*

65. *Id.*

66. *Id.*

67. Li Jing, *Ministry Seeks Opinion on Garbage Disposal*, CHINADAILY, June 19, 2010, http://www.chinadaily.com.cn/regional/2010-06/19/content_9992491.htm.

68. *Id.*

69. *Id.*

70. *Id.* (quoting Zhang 2010 press conference).

71. *Id.*

partly due to 'insufficient public participation' and 'poor transparency' on environmental impact reviews."[72]

Citizen protests have succeeded in blocking several projects in China. In December 2009, a garbage incinerator planned for the Panyu district of Guangzhou was abandoned after protests mounted by local residents.[73] When the incineration project was announced in October 2009, local residents expressed concerns that harmful emissions from the incinerator would pollute the air.[74] The authorities later apologized for their failure to solicit the opinion of local residents before proposing the project.[75] The Party secretary of Panyu District announced that in the future, matters related to garbage treatment would have to gain the consent of at least seventy-five percent of local residents.[76] He promised to inform them in advance on issues that would impact their lives.[77]

Another NGO initiative to improve transparency is the Air Quality Information Transparency Index, compiled by Renmin University's School of Law and the Institute of Public and Environmental Affairs.[78] These groups note that the Chinese public "is poorly informed about how the pollution is damaging their health," and that major indicators of air quality are lacking in city air quality reports.[79] Their report noted that China's cities "lagged behind" foreign cities "in terms of comprehensiveness of air quality indicators used in monitoring and public reporting."[80] For example, measurements of fine particles—particles less than 2.5 micrometers in diameter—were not available and levels of carbon monoxide, ozone, and volatile organic compounds (VOCs) were also absent from most city reports.[81]

Ma Jun's Institute of Public and Environmental Affairs (IPE) is at the forefront of Chinese efforts to improve environmental transparency. The IPE launched the China Water Pollution Map and China Air Pollution Map,

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72. *Id.*

73. *A Holistic Approach*, CHINADAILY, Dec. 23, 2009, http://www.chinadaily.com.cn/opinion/2009-12/23/content_9217951.htm.

74. *Id.*

75. *Id.*

76. *Id.*

77. *Id.*

78. Bao Daozu, *Report calls for changes in air monitoring*, CHINADAILY, Jan. 20, 2011, http://usa.chinadaily.com.cn/2011-01/20/content_11888358.htm.

79. *Id.*

80. *Id.*

81. *Id.*

and set up searchable databases.[82] These databases give the public access to data on environmental quality and to records of infractions by companies, released by various government agencies, including the Ministry of Environmental Protection.[83] The Chinese government's Measures for the Disclosure of Environmental Information, released in May 2008, have generated information that has grown to include 49,000 records, involving about 30,000 domestic and foreign companies, which have been warned or penalized for violations of environmental rules.[84] Ma states that, although many companies would rather pay the small penalties year after year, "the availability of information such as the Water Pollution Map and Air Pollution Map is changing the pattern as it touches upon different stakeholders because of its accessibility."[85]

This information is also helping large companies "green" their supply chains. "'It aims to curb environmental pollution in China's manufacturing hubs by integrating transparency and stakeholder participation in the existing supply chain management system.'"[86] By tapping into IPE's database, corporate users can do checks of their list of suppliers. Some multinational companies, including General Electric (GE) and Wal-Mart, are already using the databases to monitor sourcing practices in China.[87] So far, more than 130 blacklisted companies have approached IPE, explaining what went wrong and how they planned to fix the problems.[88] Many hope to be removed from the blacklist by the introduction of third-party audits confirming their improved performance.[89]

Citing the success of previous regulations, specifically Disclosure of Environmental Information (SEPA Order No. 35) and Strengthening Supervision of Listed Companies for Environmental Protection (SEPA File No. [2008] 24), on September 14, 2010, the Chinese MEP solicited public comment on new disclosure regulations.[90] Called "Guidelines for Disclosure of Environmental Information of Listed Companies," the new

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82. *Water and Air Pollution Map*, INST. OF PUB. & ENVTL. AFFAIRS, http://www.ipe.org.cn/En/pollution/index.aspx (last visited Apr. 8, 2011).

83. Gong Yidong, *The Bottom Line*, CHINADAILY, Oct. 27, 2009, http://www.chinadaily.com.cn/life/2009-11/09/content_11691695.htm.

84. *Id.*

85. *Id* (quoting Ma).

86. *Id* (quoting Ma).

87. *Id.*

88. *Id.*

89. *Id.*

90. *MEP Calls for Public Comments on Guidelines for Disclosure of Environmental Information of Listed Companies*, MINISTRY ENVTL. PROTECTION, PEOPLE'S REPUBLIC CHINA (Sept. 14, 2010), http://english.mep.gov.cn/News_service/news_release/201009/t20100926_194964.htm.

regulations would require annual environmental reports from companies in sixteen heavily-polluting sectors of the economy.[91] In these reports the companies would be required to disclose their annual discharges of pollutants, as well as their compliance status, and information about their environmental management systems. Companies whose actions spawned "environmental emergencies" would be required to make public disclosures within a day of the events.[92] These disclosures must include: (1) the major pollutants released; (2) the quantities of the releases; (3) the environmental impacts of the releases; and (4) what response measures have been taken.[93] Enforcement measures and penalties imposed on the companies also would have to be disclosed to the public.[94]

C. Developing Green Technology

China's embrace of green energy technology has occurred so swiftly and dramatically that it generated a complaint by the United Steelworkers of America (USW), accepted by the U.S. government in October 2010, that the Chinese government was violating free trade agreements.[95] In a 5,800-page petition to the U.S. Trade Representative, the USW argued that China was engaging in protectionist and predatory practices in five major areas: (1) restrictions on access to critical materials; (2) performance requirements for investors; (3) discrimination against foreign firms and goods; (4) prohibited export subsidies and domestic content subsidies; and (5) trade distorting domestic subsidies.[96] The USW complaint received wide publicity because of its implication that China was doing too much to promote green energy technology after having been criticized for years for not being sufficiently concerned about the environment.[97]

One aspect of Chinese policy that has not been widely publicized abroad is China's efforts to phase out fuel subsidies. To reduce oil consumption and boost energy conservation, China has been steadily

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91. *Id.*
92. *Id.*
93. *Id.*
94. *Id.*
95. UNITED STEELWORKERS, UNITED STEELWORKERS' SECTION 301 PETITION DEMONSTRATES CHINA'S GREEN TECHNOLOGY PRACTICES VIOLATE WTO RULES, *available at* http://assets.usw.org/releases/misc/section-301.pdf.
96. *Id.*
97. *Steelworkers File 5,800-page Petition, Picking Fight With China Over Wind Industry*, LABORUNIONREPORT.COM (Dec. 29, 2010), http://www.laborunionreport.com/portal/2010/12/steelworkers-file-5800-page-petition-picking-fight-with-china-over-wind-industry/.

raising the price of gasoline and diesel fuel by eliminating government subsidies that had kept their prices artificially low.[98] Unlike the situation in the United States, it is not anathema for senior Chinese policymakers to suggest imposition of carbon taxes. Cheng Siwei, a renowned Chinese economist and a former senior legislator, said China is estimated to reduce the proportion of fossil fuel in total energy mix from the current ninety-one percent to eighty-five percent in 2020.[99] He suggested that the best way for China to achieve this goal was to impose a carbon tax on thermal power plants and to use the revenue to subsidize solar and wind energy development.[100]

China's development of green energy technology has occurred so rapidly that the country's businesses are now making major inroads in export markets throughout the world. More Chinese green energy companies are investing in the United States:

> Goldwind Science & Technology Co., one of China's largest wind turbine manufacturers based in the Xinjiang Uygur autonomous region, made a significant mark in the U.S. by winning a bid to supply China-made turbines to an Illinois-based large wind farm project . . . .[101] Sinovel Wind Group Co. Ltd, China's largest wind turbine maker, was in discussions with the Ohio state government on the possibility of opening a factory there.[102]

Like the wind power industry, the Chinese solar-energy market is also developing a more and more globalized industry chain. For example, "[s]ince October 2010, China's Suntech Power Holdings Co. has been producing solar panels in a 36,500-square-meter plant in the Arizona desert."[103]

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98. *See China Conducts Lower-Than-Expected Increase in Gasoline, Diesel Prices*, GOV.CN (Feb. 19, 2011), http://english.gov.cn/2011-02/19/content_1806466.htm (noting that the Chinese government was increasing gasoline prices by 350 yuan per ton); *China Raises Gasoline, Diesel Prices*, GOV.CN (Dec. 7, 2010), http://english.gov.cn/2010-12/21/content_1770592.htm (describing the second increase in fuel prices in two months, a move explained by the NDRC as designed to restrain rapid increases in the country's oil consumption and to boost energy conservation).

99. *Ex-Lawmaker: China to Cut Fossil Fuel in Total Energy Mix to 85% by 2020*, GOV.CN (Sept. 14, 2010), http://english.gov.cn/2010-09/14/content_1702154.htm.

100. *Id.*

101. *Sun Shining Brightly on Blossoming Green Industry*, MINISTRY OF ENVTL. PROTECTION, THE PEOPLE'S REPUBLIC OF CHINA (Jan. 20, 2011), http://english.mep.gov.cn/News_service/media_news/201101/t20110120_200082.htm.

102. *Id.*

103. *Id.*

China has the lion's share of global production of rare earth minerals that are crucial to many green energy technologies. In recent years, the Chinese government has moved to curb exports of these vital minerals.[104] "As the world's largest rare earth producer and exporter, China provides more than 90 percent of the global rare earth demand, though its reserves account for only one-third of the world's total."[105] Serious environmental concerns have been raised about some of China's rare earth producers. In November 2010, the Chinese MEP released a blacklist of environmental violators who have created heavy metals pollution.[106] These included: eight antimony smelting enterprises in the Xikuangshan area, two regional environmental infringements in Lengshuijiang City of Hunan Province, three enterprises that discharge heavy metal pollutants in Nandan County, and in the Guangxi Zhuang Autonomous Region, eight corporate environmental infringements, including Baotou Hazardous Waste Disposal Center in Inner Mongolia.[107]

China's aggressive promotion of domestic green energy companies indicates that the country has embraced a long line of scholarship arguing that investment in green technologies improves both the environment and the economy. The pioneering book in this area, published in 1994, is Curtis Moore and Alan Miller's *Green Gold: Japan, Germany, the United States, and the Race for Environmental Technology*.[108] Moore and Miller argue that "decisions are too often driven by the outmoded and false view that the environment can be protected only at the cost of the economy, when the truth is precisely the opposite."[109] Moore and Miller's study notes that "states with stronger environmental policies consistently out-performed the weaker environmental states on all the economic measures"[110] because "tough standards trigger innovation and upgrading."[111] Focusing on the development of environmental technology in Japan and Germany, Moore and Miller note that:

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104. *China to Further Regulate Rare Earth Exports: MOC Spokesman*, GOV.CN (Feb. 17, 2011), http://english.gov.cn/2011-02/17/content_1805274.htm.

105. *China to Streamline Rare Earth Industry Within Five Years*, GOV.CN (Feb. 16, 2011), http://english.gov.cn/2011-02/16/content_1804598.htm.

106. *MEP to Seriously Crack Down Environmental Infringements of Heavy Metals Pollution*, MINISTRY OF ENVTL. PROTECTION, THE PEOPLE'S REPUBLIC OF CHINA (Nov. 17, 2010), http://english.mep.gov.cn/News_service/news_release/201011/t20101122_197778.htm.

107. *Id.*

108. CURTIS MOORE & ALAN MILLER, GREEN GOLD: JAPAN, GERMANY, THE UNITED STATES, AND THE RACE FOR ENVIRONMENTAL TECHNOLOGY (1995).

109. *Id.* at 2.

110. *Id.* at 75.

111. *Id.* at 38.

> By the 1990s, Japanese government and industry had developed a menu of technologies and practices which demonstrated beyond question that pollution—even carbon dioxide emissions—could be cut substantially in ways that increased efficiency and lowered costs. These Japanese efforts challenged the conventional wisdom among most American scientists, engineers, and politicians that pollution is the inevitable consequence of industrial productivity. In fact, they suggested—as did German efforts—that just the reverse was true: the path to true productivity is one where the goal is zero pollution and 100-percent efficiency.[112]

Writing more than a decade later, Yale law professor Dan Esty and Andrew S. Winston argue in their similarly-titled book *Green to Gold* that companies investing in green energy technology can ride the "green wave" to better corporate performance.[113] Etsy and Winston make the case that the development of green energy technology will improve both the environment and the economy, just as Moore and Miller had argued many years before.[114]

D. China's Twelfth Five Year Plan: The Green Leap Forward

Since 1953, China's National People's Congress (NPC) has regularly reviewed and approved its most important policy tool: a Five Year Plan consisting of initiatives and policies to be implemented over the next five years. On March 14, 2011, the NPC approved China's Twelfth FYP.[115] As China seeks to move from an export and infrastructure driven economy to a consumer demand driven economy,[116] energy and the environment have taken center stage in national planning as never before. The Twelfth FYP calls for a wave of aggressive environmental and energy initiatives and policies and is the first FYP to mention climate change.[117] Notably,

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112. *Id.* at 45.

113. DANIEL ETSY & ANDREW S. WINSTON, GREEN TO GOLD 8, 11, 13, 18 (2006).

114. MOORE & MILLER, *supra* note 108, at 2.

115. Steve Dickinson, *China's 12th Five Year Plan. Infrastructure, Infrastructure, and More Infrastructure. Did We Say Infrastructure?*, CHINA LAW BLOG (Mar. 18, 2011), http://www.chinalawblog.com/2011/03/chinas_12th_five_year_plan_infrastructure_infrastructure_infrastructure_did_we_say_infrastructure.html.

116. *Id.*

117. Climate Change is at the top of the Twelfth FYP's environmental section. Deborah Seligsohn & Angel Hsu, *How Does China's 12th Five-Year Plan Address Energy and the Environment?*,

aggressive FYP energy and environmental targets are domestically binding and thus carry significant political weight.[118]

The Twelfth FYP sets ambitious clean energy goals that aim to reduce China's dependence on coal,[119] build the renewable energy sector, and increase the share of energy generated by clean technologies, while decreasing greenhouse gas emissions.[120] The Twelfth FYP sets a target of a seventeen percent reduction in carbon dioxide emissions per unit GDP by 2015.[121] Additionally, the Twelfth FYP sets a sixteen percent energy reduction target to be met by 2015.[122] Both the carbon dioxide emissions and energy reduction targets are congruent to the forty to forty-five percent reduction in carbon intensity from 2005 that China agreed to at Copenhagen talks in 2009 and reaffirmed in Cancun this year.[123]

The Twelfth FYP emphasizes China's commitment to international cooperation to combat climate change, including the United Nations-led negotiation process.[124] This section of the FYP also discusses the need for more climate change adaptation measures.[125] The FYP also assigns specific targets for cities in order to reach new motor vehicle emission standards.[126] To reach these and other energy and environmental goals, the MEP has stated that 3.1 trillion yuan will be invested in the green sector over the next five years.[127]

The Twelfth FYP calls for several measures to radically alter China's energy portfolio. China seeks to increase its share of primary energy consumption from non-fossil fuels to 11.4% by 2015 by building 235 gigawatts of power generation capacity from clean energy sources.[128] In an

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WORLD RESOURCES INST. (Mar. 7, 2011), http://www.wri.org/stories/2011/03/how-does-chinas-12th-five-year-plan-address-energy-and-environment.

118. Damien Ma, *Energy Policy to Fuel Economic Objectives*, CHINADAILY, Mar. 21, 2011, http://www.chinadaily.com.cn/thinktank/2011-03/21/content_12199982.htm.

119. Approximately seventy percent of China's energy is generated by coal. *Id.*

120. To track progress toward these goals, Premier Wen Jaibao stated that China would establish "well-equipped statistical and monitoring systems for greenhouse-gas emissions, energy conservation and emission reductions." Seligsohn & Hsu, *supra* note 117.

121. *Id.*

122. *Id.*

123. *Id.*

124. *Id.*

125. *Id.*

126. *Id.*

127. Li Xiang, *It's Waste Not, Want Not in Trash Management*, CHINADAILY, Mar. 25, 2011, http://www.chinadaily.com.cn/cndy/2011-03/25/content_12224882.htm.

128. *China Announces Clean Energy Plans for the Next Five Years*, 2011 NPC & CPPCC: THE NEXT 5 YEARS (Mar. 5, 2011), http://www.chinadaily.com.cn/china/2011npc/2011-

effort to reach this target, the Twelfth FYP calls for 70 gigawatts of additional wind energy installation, 40 new gigawatts of nuclear capacity,[129] 120 gigawatts of hydropower capacity along major rivers, and 5 gigawatts of solar power capacity by 2015.[130] The vast list of projects in the FYP also includes new oil and gas pipelines, new electricity transmission lines, improving coal transport and storage, increasing new coal fired power plant capacity, oil and gas field development in Inner Mongolia and Xinjiang, and expanding domestic oil refining capacity and liquid natural gas storage and transmission.[131]

Environmental policy initiatives in the Twelfth FYP include initiatives addressing major pollutants and waste treatment and disposal. China will put approximately seventy-five billion yuan ($11.4 billion) toward combating heavy metal pollution.[132] Though the FYP does not explicitly set targets for other major environmental pollutants, the NPC announced pollutant reduction targets of eight percent for chemical oxygen demand and sulfur dioxide and ten percent for ammonia nitrogen and nitrogen oxides.[133] The FYP includes plans to invest up to 180 yuan ($27.7 billion) in urban waste disposal and expand waste treatment to the entire country in order to achieve an eighty percent rate of harmless treatment of household waste by 2015.[134] To complement its waste treatment plans, the FYP also emphasizes increased reuse and recycling.[135]

The Twelfth FYP also calls for increased measures to protect China's coastal and forest environments. The FYP includes measures to improve pollution control in coastal regions and calls for uninhabited islands to be put to better use.[136] The FYP also aims to strengthen China's ability to

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03/05/content_12120038.htm. At Copenhagen, China committed to produce fifteen percent of its energy from non-fossil fuels by 2020. Hu Angang, *supra* note 7.

129. Seligsohn & Hsu, *supra* note 117. If China reaches this goal, it will have the largest installed nuclear energy capacity in the world by 2020. *Id.*

130. 2011 NPC & CPPCC: THE NEXT 5 YEARS, *supra* note 128.

131. Dickenson, *supra* note 115.

132. *12th Five-Year Plan (2011-2015), China Tackle Heavy-Metal Pollution*, GREEN ENERGY, RENEWABLE POWER, ECO-FRIENDLY (Feb. 21, 2011, 11:37 PM), http://www.energy-green.net/blog/articles/green-development/12th-Five-Year-Plan-China-tackle-heavy-metal-pollution.html.

133. Seligsohn & Hsu, *supra* note 117.

134. Xiang, *supra* note 127.

135. Seligsohn & Hsu, *supra* note 117.

136. Wang Qian, *National Standard to Help Clean Up Coastal Pollution*, CHINADAILY, Mar. 25, 2011, http://www.chinadaily.com.cn/china/2011-03/25/content_12224410.htm.

respond to marine emergencies.[137] A goal to increase forest cover area by forty million hectares also is included in the FYP.[138]

E. Environmental Protection in English and Chinese: Google's Ngram

In December 2010, Google released a new multi-lingual research tool called the "Ngram Viewer."[139] The viewer allows for searches of the frequency in which particular terms occur in the millions of books that Google has scanned in several different languages. Using this tool for the term "environment" in Chinese, an Ngram search reveals a dramatic and steady increase in the frequency with which this term appears in Chinese language books scanned by Google, as represented in Figure I. The term first appears to gain in popularity during the 1940s, but it does not surge in popularity until the 1970s when it steadily increases in frequency through 2008, the last year for which the Google database is searchable.

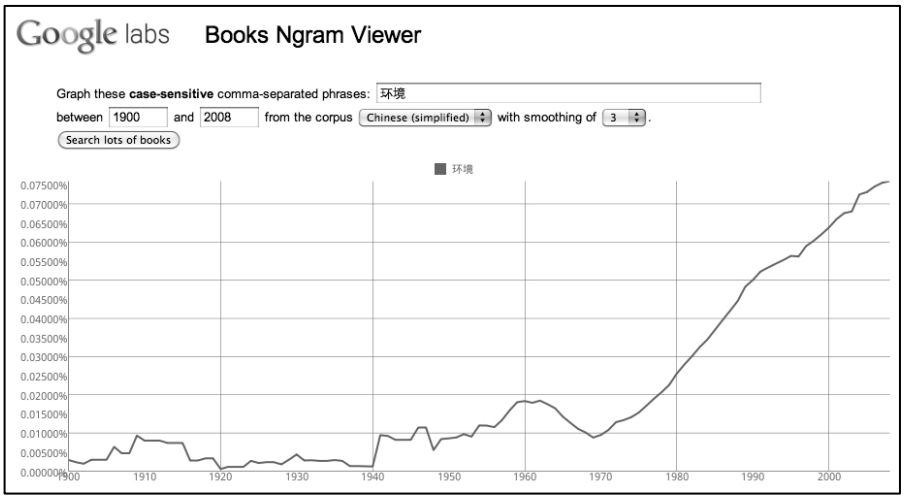

Figure I. Frequency of the Term "Environment" Appearing in Chinese Language Books from 1900–2008

137. *Id.*

138. Seligsohn & Hsu, *supra* note 117.

139. Clint Boulton, *Google Ngram Viewer Gauges World Popularity over Centuries,* EWEEK.COM (Dec. 18, 2010), http://www.eweek.com/c/a/Search-Engines/Google-Ngram-Viewer-Gauges-Word-Popularity-Over-Centuries-179056/.

By contrast, when the term "environment" is searched in English-language books, it steadily increases in frequency from 1880 to 1920 when its frequency peaks until the 1960s and the first half of the 1970s when it soars dramatically, as indicated in Figure II. It surges again in the 1990s before declining in the first decade of the twenty-first century. A similar pattern appears when the terms "environmental protection" are searched with a continued surge in frequency in Chinese language books holding true through the present, while the term peaks in frequency in English-language books at the turn of the century and then steadily declines (compare Figures III and IV).

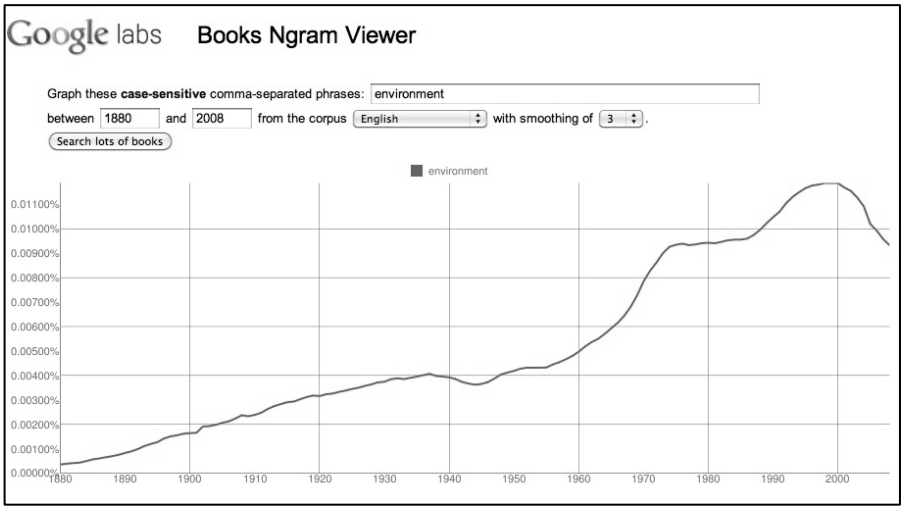

Figure II. Frequency of the Term "Environment" Appearing in English Language Books from 1880–2008

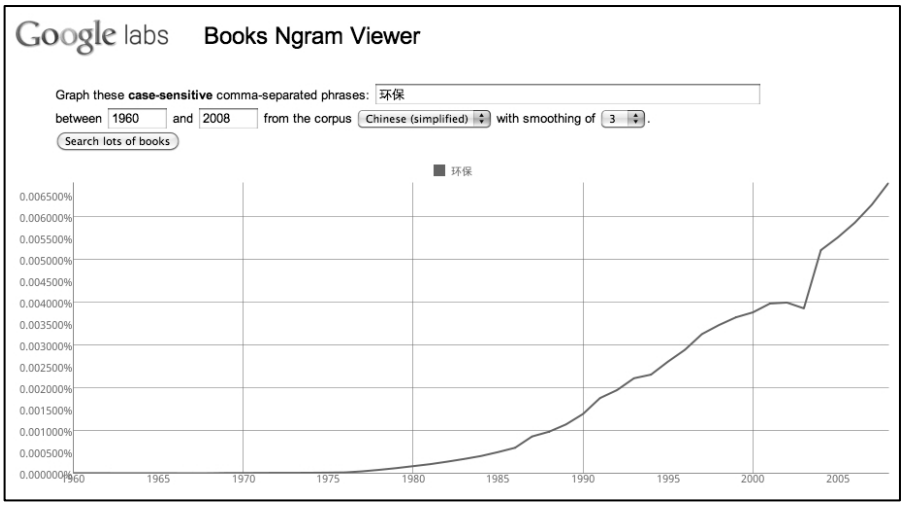

Figure III. Frequency of the Term "Environmental Protection" Appearing in Chinese Language Books from 1960–2008

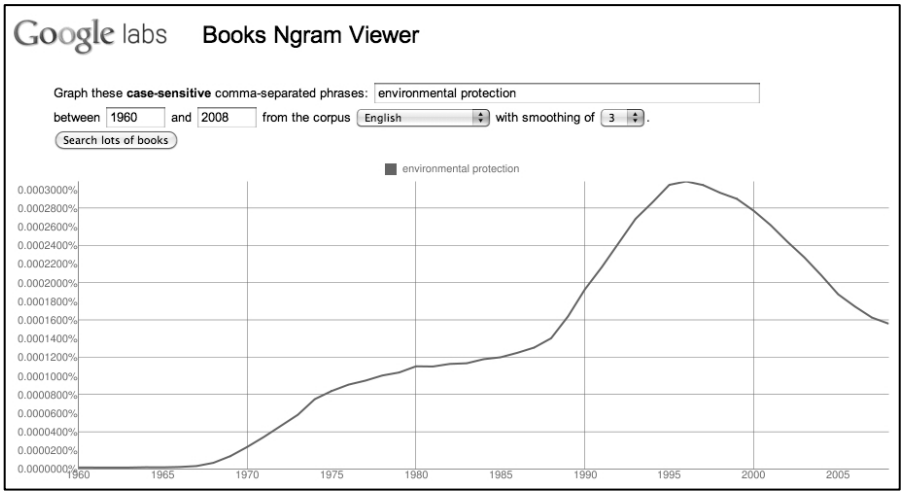

Figure IV. Frequency of the Term "Environmental Protection" Appearing in English Language Books from 1960–2008

III. A CAUTIONARY NOTE: CHINA'S GROWING USE OF ASBESTOS

While China may be in the midst of a "Green Leap Forward," there are some serious gaps in its environmental policies. One of the most serious is

the Chinese government's failure to follow the lead of the developed world in banning all remaining uses of asbestos. Fifty-five countries, including nearly all of the developed world, have already banned asbestos because of the many fatal diseases that it causes.[140] Even the World Trade Organization has concluded that asbestos is so dangerous that no country risks liability for unfair trade restrictions when it bans asbestos.[141]

While China regulates asbestos, it is the world's leading consumer of this deadly product and its consumption is increasing significantly.[142] Although the Chinese government has put forward guidelines for worker protection, factories in China "flagrantly fail to respect Chinese law."[143] Jukka Takala, director of the European Agency for Safety and Health at Work (EU-OSHA), estimates that the annual death toll from mesothelioma, lung cancer, and other asbestos-related diseases in China may reach 15,000 by 2035.[144] China has banned brown and blue asbestos, as well as banning use of all forms of asbestos in car brake linings and other friction products, but it has accepted the asbestos industry's dubious claim that chrysotile asbestos is not as hazardous as other forms of the product.[145] During the run-up to the 2008 Olympics, Beijing banned all asbestos-containing materials in construction, a ban that remains in force today.[146] However, more than 400 factories produce 300 million square meters of asbestos sheeting in China each year, while other factories continue to make asbestos brake pads, gaskets, and cloth.[147]

Canada has profited mightily from exporting this deadly product throughout the developing world. A report from the Center for Public Integrity states:

> In 2009, Canada exported nearly 153,000 tons of chrysotile asbestos. More than half went to India; the rest went to

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140. Laurie Kazan-Allen, *Current Asbestos Bans and Restrictions*, INT'L BAN ASBESTOS SECRETARIAT (Jan. 6, 2011), http://ibasecretariat.org/alpha_ban_list.php.

141. *European Communities – Measures Affecting Asbestos and Products Containing Asbestos* WORLD TRADE ORG. (April 5, 2001), http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds135_e.htm.

142. *See Inside the Global Asbestos Trade*, BBC NEWS (July 21, 2010, 12:12 AM), http://www.bbc.co.uk/news/world-asia-pacific-10685397 (reviewing the asbestos regulation, enforcement, and workplace conditions in China).

143. *A Ravenous Appetite for Asbestos*, *Dangers in the Dust: Inside the Global Asbestos Trade*, THE CENTER FOR PUBLIC INTEGRITY, http://www.publicintegrity.org/investigations/asbestos/articles/entry/2194/ (last visited May 5, 2011).

144. *Id.*

145. *Id.*

146. *Id.*

147. *Id.*

> Indonesia, Thailand, Mexico, Sri Lanka, Pakistan, and the United Arab Emirates. At home, it is a different story: Canada used only 6,000 tons in 2006, the last year for which data is available.[148]

Yet China's consumption of asbestos dwarfs Canada's production. It is estimated that China consumed 626,000 metric tons of raw asbestos fiber in 2007—more than twice that of India, the next largest consumer.[149] China mined 280,000 metric tons of asbestos in 2008, making it the world's second-largest producer.[150] It is estimated that there are one thousand enterprises in China that employ more than a million people in the production and processing of asbestos.[151] China is reluctant to curb its asbestos use because the country has large domestic supplies of the product. There may be as many as ninety million tons of chrysotile asbestos in the ground in China, mostly in the western part of the country.[152]

Although China has tightened its exposure limits, as U.S. regulators have learned, even the tightest exposure limits cannot prevent unhealthful conditions in factories. In the city of Yuyao, in Zhejiang province, inspectors in 2008 found dangerous conditions in most of the 100 small asbestos workshops they inspected.[153] An investigation by a local journalist found considerable worker exposure to asbestos dust in local workshops.[154] The disposable masks many workers wore offer little protection against tiny, airborne asbestos fibers.[155] Five of eight workers who had just had chest X-rays already were found to have lung abnormalities.[156]

CONCLUSION

Despite its recent "Green Leap Forward," China still faces immense environmental challenges. Even the best environmental laws cannot be

148. *Exporting an Epidemic*, *Dangers in the Dust: Inside the Global Asbestos Trade*, THE CENTER FOR PUBLIC INTEGRITY, http://www.publicintegrity.org/investigations/asbestos/articles/entry/2183/ (last visited May 5, 2011).

149. THE CENTER FOR PUBLIC INTEGRITY, *supra* note 143.

150. *Id.*

151. *Id.*

152. *Id.*

153. *Id.*

154. *Id.*

155. *Id.*

156. *Id.*; *see World Asbestos Consumption From 2003 to 2007*, CENTER FOR PUBLIC INTEGRITY (July 21, 2010), http://www.publicintegrity.org/investigations/asbestos/consumption/ (last visited May 5, 2011) (showing China as the world's top asbestos consumer from 2003–2007).

enforced adequately in a legal system that does not have an independent judiciary or express provisions authorizing citizen suits, including suits against government agencies who fail to perform their mandatory duties. China also needs to close some serious gaps in its environmental policies, including its failure to ban all uses of asbestos products, a deadly substance for which China is now the world's leading consumer. Nevertheless, China has made some important steps toward becoming a global leader on environmental issues by embracing green technology as a business opportunity and by acknowledging the severe impacts that unabated climate change would have on both its economy and environment.