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# The Implementation Challenge of Mitigating China's Greenhouse Gas Emissions

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# The Implementation Challenge of Mitigating China's Greenhouse Gas Emissions

TSEMING YANG\*

## INTRODUCTION

With the growth of the developing world's population and economies, limiting the global increase in anthropogenic greenhouse gas emissions has grown in significance. The parties to the U.N. Climate Change Convention acknowledged this reality in the Bali Action Plan, which calls for "nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner."<sup>1</sup>

The Bali Action Plan does not impose new obligations. It does create a negotiation framework for a post-Kyoto agreement and engages the developing world, especially major greenhouse gas ("GHG") emitters, such as China, in discussions about binding emission limits. However, beyond the imperative of involving developing countries in binding commitments, little consideration has been given to what this would entail, especially for China.

The essay provides an overview of the challenge of mitigating China's greenhouse gas emissions. Part I of the essay provides background on China's significance to the problem. Part II will review China's recently released "National Climate Change Programme," its national strategy to address climate change, as well as some key initiatives to mitigate carbon emissions. Part III will turn to the Climate Plan's shortcomings with respect to environmental sustainability and effectiveness. Part IV will discuss the uncertain prospects of China's ability to implement the Climate Plan effectively through its existing regulatory policies and institutional structures. Part V suggests some options for addressing these issues.

Gaining a better understanding of these issues provides a window into the

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\* Professor of Law, Vermont Law School; Director of Vermont Law School—Sun Yat-sen University Partnership for Environmental Law in China, a program supported with funding from the U.S. Agency for International Development. The views expressed in this essay are those of the author alone and should not be attributed to U.S. AID or the U.S. government. I am grateful to Gu Dejin and Jiao Bo for providing me with many valuable insights on China's environmental laws, John Echeverria and other participants at the Georgetown International Environmental Law Review's workshop for their useful comments, and Quoc Nguyen and Bill Eubanks for helpful research. © 2008, Tseming Yang.

1. U.N. Framework Convention on Climate Change, Conference of the Parties, Thirteenth Session, Bali Action Plan para. 1(b)(ii), Decision 1/CP.13, U.N. Doc. FCCC/CP/2007/6/Add.1 (March 14, 2008) available at <http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf>.

prospects of legally binding emissions commitments by China. More importantly for those engaged in practical and constructive efforts to engage China on climate change, the paper suggests areas where assistance may be most worthwhile.

### I. CHINA'S SIGNIFICANCE TO GLOBAL CLIMATE CHANGE EFFORTS

China has become a primary focus of discussions about involving developing nations in mitigation efforts because of the size of its population and its rapid, double-digit economic growth. According to a recent inventory of the International Energy Agency ("IEA"), China was the world's second-largest source of fossil fuel energy-related greenhouse gas emissions in 2005, with 5060 mega tons of carbon dioxide, just after the United States, which released 5817 mega tons.<sup>2</sup> With total worldwide fossil fuel emissions running at 27,136 mega tons carbon dioxide,<sup>3</sup> the U.S. and China were responsible for 21.4 percent and 18.6 percent of global CO<sub>2</sub> emissions, respectively.<sup>4</sup> Both were far ahead of the energy-related emissions of Russia, Japan, and India, distantly ranked third through fifth, with individual emissions at just about a quarter of those levels.<sup>5</sup>

Earlier estimates had predicted that China would not become the world's largest GHG emitter until the end of the decade. However, the very latest estimates of the IEA indicate that China surpassed the United States already in 2007.<sup>6</sup>

Of course, annual national emissions do not provide the whole picture about climate change responsibility and opportunities for mitigation. Historical contributions and per capita emissions are also critical considerations. For example, in 2000, each United States citizen contributed on average 24.3 tons of CO<sub>2</sub> per person while those in China released just 3.9 tons CO<sub>2</sub> per person.<sup>7</sup> Those

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2. INT'L ENERGY AGENCY, KEY WORLD ENERGY STATISTICS 2007 at 50, 56 (2007). The last official figures for China's overall GHG emission inventory are for 1994, filed with the UNFCCC in 2004, and amounted to 3650 mega tons CO<sub>2</sub>. PEOPLE'S REPUBLIC OF CHINA, NATIONAL COMMUNICATION ON CLIMATE CHANGE 27 (2004), available at <http://www.ccchina.gov.cn/WebSite/CCChina/UpFile/File175.pdf>.

3. INT'L ENERGY AGENCY, *supra* note 2, at 48.

4. China's own most recent comprehensive estimate of all of its greenhouse gas emission (fossil fuel combustion and other sources) put the 2004 total at 5,600 mega tons of CO<sub>2</sub> equivalent, if land use, land use changes, and forestry activities (LULUCF) are included, and 6,100 mega tons of CO<sub>2</sub> equivalent, if LULUCF are excluded. NAT'L DEV. & REFORM COMM'N, CHINA'S NATIONAL CLIMATE CHANGE PROGRAMME 6 (2007), available at <http://en.ndrc.gov.cn/newsrelease/P020070604561191006823.pdf>. By comparison, US net GHG emissions were 6.4 g tCO<sub>2</sub> (per UNFCC data).

5. *Id.* (Russia at 1544 megatons, Japan at 1214 megatons, and India at 1147 megatons).

6. Shai Oster, *China Seems Poised to Pass U.S. as Top Greenhouse-Gas Emitter*, WALL ST. J., Apr. 24, 2007, <http://online.wsj.com/article/SB117735208071379218.html>. According to the Netherlands Environmental Assessment Agency, China became the world's greatest emitter of carbon dioxide in 2006. Press Release, Neth. Env'tl. Assessment Agency, China Now no. 1 in CO<sub>2</sub> emissions, USA in second position (June 19, 2007) available at <http://www.mnp.nl/en/service/pressreleases/2007/index.html> (click on title); see also *China overtakes U.S. in greenhouse gas emissions*, INT'L HERALD TRIB., June 20, 2007, available at <http://www.iht.com/articles/2007/06/20/business/emit.php>.

7. World Resources Institute, Climate Analysis Indicators Tool (CAIT), <http://cait.wri.org>.

numbers ranked the U.S. seventh and China ninety-ninth in the world.<sup>8</sup> With respect to historical contributions to current atmospheric carbon dioxide levels, Western Europe and North America have contributed the lion's share of emissions. The shift of much manufacturing activity to China, which exports many goods to the U.S. and Western Europe, means that the industrialized world is also indirectly responsible for a large portion of China's carbon footprint.

Nevertheless, China and other developing countries have important stakes in controlling anthropogenic GHG emissions. Sea-level rise, changes in climate and weather, and adverse effects on ecosystems and public health will be felt by both the industrialized and the developing world regardless of who contributed to the problems. In fact, the consequences of climate change will affect the poorest populations and developing nations much more than wealthier communities and the industrialized world.<sup>9</sup>

In the past, China has been reluctant to discuss binding international commitments to mitigate greenhouse gas emissions. Nevertheless, it is pursuing a number of policies that seek to accomplish that very goal. The chief efforts have focused on energy efficiency and conservation, renewable energy resources, industrial restructuring, and implementation of the Kyoto Protocol's Clean Development Mechanism.<sup>10</sup>

The initiatives present significant mitigation opportunities in the world's now-largest GHG emitter. Unfortunately, mitigation opportunities in China have also led to a sentiment that if only China were to commit internationally to curb its GHG releases, the need for the industrialized world to reduce emissions sharply over the coming decades might not be as urgent. The reality is not as rosy. Even if China were to adopt significant and binding GHG emissions, there are serious concerns about how they would be implemented and whether such targets could be effectively achieved. First, China's continued overwhelming focus on economic development objectives, which runs through China's climate programs, raises questions as to whether its policies can promote environmental sustainability. Second, the weakness of China's existing environmental regulatory infrastructure and legal institutions put into doubt its ability to limit GHG emissions effectively.

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8. *Id.*

9. Andrew Revkin, *U.N. Warns of Climate-Related Setbacks*, N.Y. TIMES, Nov. 28, 2007; U.N. DEV. PROGRAMME, HUMAN DEVELOPMENT REPORT 2007/2008 – FIGHTING CLIMATE CHANGE: HUMAN SOLIDARITY IN A DIVIDED WORLD. China's National Communication under UNFCCC article 4(1)(j) and article 12 sets out a range of possible adaptation measures to meet the impacts of climate change, ranging from ensuring water availability in the arid north to increasing height of dikes closer to the coast. See People's Republic of China, Initial National Communication on Climate Change 66-71 (2004), available at <http://unfccc.int/resource/docs/natc/chnnc1e.pdf>.

10. Joanna Lewis, *China's Strategic Priorities in International Climate Change Negotiations*, WASH. Q., Winter 2007-08, at 155, 159-165.

## II. CHINA'S CLIMATE PLAN AND KEY GREENHOUSE GAS MITIGATION EFFORTS

China's official program related to climate change was most recently set out in a paper released by the National Development and Reform Commission in June 2007. The much anticipated "National Climate Change Programme" ("Climate Plan") created a new National Leading Group to Address Climate Change, headed by Prime Minister Wen Jiabao. The Leading Group's purpose was to elevate the issue to the highest governmental levels.<sup>11</sup> More importantly, it sought to articulate a national strategy that includes both mitigation and adaptation measures.

China's mitigation strategy has focused primarily on the energy sector, especially energy efficiency and conservation, industrial processes, and renewable energy projects, while also taking advantage of the opportunities presented by the Kyoto Protocol's Clean Development Mechanism.<sup>12</sup> It also plans to "establish [by 2010] a suitable and high-efficiency institutional and management framework to address climate change in the future."<sup>13</sup>

Energy efficiency and conservation are being targeted as important opportunities for GHG mitigation because "out-of-date processes and technologies still occupy a relatively high proportion of China's key industries, [resulting in overall] energy efficiency [that] is about 10% lower than that of developed countries."<sup>14</sup> "Production of energy-intensive products requires about 40% more energy than 'the advanced international level.'"<sup>15</sup>

To achieve the energy-related goals, the Plan relies heavily on the eleventh five-year plan (2006-2010) requirement that energy consumption per unit of GDP be reduced by 20 percent by 2010 (compared to 2005). The goals are to be accomplished primarily through changing "economic growth pattern," energy conservation and efficiency, and technological modernization.<sup>16</sup> The aim is integration of "climate change policy with other interrelated policies" including "energy structure optimization."<sup>17</sup> In other words, the central government has sought to integrate the climate change program with its overall economic policy.

Ongoing energy efficiency and conservation efforts include the phase-out of inefficient coal-fired power plants and replacing them with more efficient and cleaner-burning facilities, mandates related to vehicle fuel economy standards, and efficiency efforts related to the electric transmission grid. The overall effect has been to reduce the energy intensity of China's economy.

China has also promoted renewable energy resources, such as wind farms,

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11. NDRC, *supra* note 4, at 56.

12. Lewis, *supra* note 10, at 155, 159-165.

13. NDRC, *supra* note 4, at 29.

14. *Id.* at 20.

15. *Id.*

16. NDRC, *supra* note 4, at 26. The Plan also calls for the reduction of major pollutants by 10 percent.

17. *Id.* at 25.

hydro-electric facilities, and solar, geothermal, and biomass projects as a top priority. By 2010, it expects hydropower development to contribute up to 500 million tons of CO<sub>2</sub> reductions; nuclear power about 50 million tons in CO<sub>2</sub> reductions; more efficient coal-fired power plants about 110 million tons in reductions; utilization of coal-bed methane and coal-mine methane about 200 million tons of reductions; biomass energy about 30 million tons; and wind, solar, geothermal, and tidal energy resources to contribute up to 60 million tons in reductions.<sup>18</sup>

Adaptation under the Climate Plan targets agriculture, forests and other natural ecosystems, water resources, and coastal zones and regions.<sup>19</sup> The specific measures include improvement in water-saving irrigation methods, breeding stress-resistant crop varieties, prevention of desertification, limiting logging in existing forest resources, enhancing water storage infrastructure, speeding up the construction of the south-to-north water diversion project, building of dikes, and improving shore protection.<sup>20</sup> Like its mitigation policies, however, most of the adaptation programs are designed to coincide with ongoing agricultural policies and resource management programs.

Opportunities for foreign investment and the financial benefits of carbon trading have led China also to take advantage of the Kyoto Protocol's Clean Development Mechanism ("CDM") as another key climate initiative.<sup>21</sup> The CDM is a project-based mechanism which allows investors to sponsor facilities or programs in developing countries to avoid greenhouse gas emissions that would otherwise have occurred in the absence of the project.<sup>22</sup> Since developing countries like China do not have greenhouse gas emission limits under the Kyoto Protocol, the avoided emissions generate a set of carbon credit that can be traded and used by industrialized countries to satisfy their Kyoto Protocol Annex B emission limitations.

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18. *Id.* at 32-34. China's Climate Plan also refers to its population control policies as having made important contributions to limiting GHG emissions. *Id.* at 11. Given that most greenhouse gas emissions are directly or indirectly tied to energy use by or for consumers, population control has a significant effect in curbing energy demand and therefore greenhouse gas emissions. Thus, China's government indicates that the 300 million births averted by its family planning policies by 2005 resulted in 1.3 billion tons of averted CO<sub>2</sub> emission.

19. *Id.* at 47-52.

20. *Id.*

21. Lewis, *supra* note 10, at 155, 159-65.

22. Kyoto Protocol to the United Nations Framework Convention on Climate Change, art. 12, Dec. 10, 1997, 37 I.L.M. 22 (1998). A project to construct a hydro-electric power facility that would replace an existing fossil fuel power plant could generate carbon credits in the amount of the avoided carbon dioxide emissions because those carbon emissions will no longer be released into the atmosphere. The hydro-power facility has made the fossil fuel power plant unnecessary. Determination of the appropriate number of credits generated are made by the Kyoto Protocol CDM Executive Board, which supervises all aspects of the CDM, including eligibility, methodology of credit determination, and verification processes. *See generally* U.N. Framework Convention on Climate Change, *Report of the Conference of the Parties Serving as the Meeting of the Parties of the Kyoto Protocol FCCC/KP/CMP/2005/8/Add.1*, (March 30, 2006), Annex to Decision 3/CMP.1, at para. C, available at <http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf>.

One of the primary purposes of the Kyoto Protocol's CDM provision was to assist industrialized nations fulfill their Annex B obligations by reducing GHG emissions in the developing world.<sup>23</sup> Since developing nations, including China, still rely heavily on relatively dirty and energy inefficient technologies, there are opportunities for significant and relatively cheap emission reductions. Thus, CDM projects in China can generate greenhouse gas emission credits at a lower cost than the existing market-price for carbon credits elsewhere and create opportunities for profit.

The primary environmental benefit of CDM projects lies in the transfer of clean development and low GHG-emission technology to countries such as China. Since virtually all of the credits generated are likely to be transferred and used for Annex B compliance purposes, the mechanism will arguably result in negligible net reductions in short-term global GHG emissions. Nevertheless, the CDM has the potential to create infrastructure that can support substantial reductions of such emissions in the long-term future. By demonstrating the environmental benefits and economic feasibility of cleaner technologies and approaches, CDM projects are expected to set China and other developing countries on a path toward economic development that produces fewer carbon emissions in the long-run and is more environmentally sustainable.<sup>24</sup>

Kyoto's CDM program has allowed credits to be banked since 2000. China's involvement gained momentum only after 2004, however, when it first promulgated national regulations governing approval of CDM projects in China.<sup>25</sup> As of January 1, 2008, China was serving as host to 147 CDM Board registered projects.<sup>26</sup> The projects range in focus from renewable energy ventures, such as windfarm, hydropower, and biomass facilities to reforestation, methane recovery, and industrial waste gas destruction, such as decomposition of HFC and N<sub>2</sub>O.

Not surprisingly, China, the largest developing country, is one of the leading nations with respect to the hosting of CDM projects. Its developing economy presents many opportunities for energy efficiency improvements and pollution reduction. In terms of the sheer number of projects, as of January 2008, China hosts the second largest number of CDM projects registered (and approved) by the CDM Board: 16 percent of all projects.<sup>27</sup> Only India, with 35 percent of all

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23. Kyoto Protocol, *supra* note 22, art. 12(2).

24. *Id.*

25. See Interim Measures for Operation and Management of Clean Development Mechanism Projects in China (June 2004). The Interim Regulations have been superseded. See Measures for Operation and Management of Clean Development Mechanism Projects in China (effective Oct. 12, 2005), art. 26, available at <http://cdm.ccchina.gov.cn/english/NewsInfo.asp?NewsId=905> [hereinafter Measures].

26. Data on CDM throughout this Article was obtained from the UNFCCC CDM website, <http://cdm.unfccc.int/index.html> (CDM data from January 1, 2008 on file with author) [hereinafter CDM data]. As this issue was going to press in August, 2008, the number of registered CDM projects hosted by China had grown to 254.

27. *Id.* Brazil and Mexico were a relatively close 3<sup>rd</sup> and 4<sup>th</sup> with 13% and 11% of projects, respectively. *Id.*

projects, hosted a larger number.<sup>28</sup>

Altogether, CDM projects hosted in China are expected to generate carbon credits that, if annualized for 2008-2012, would amount to 91 million tons of carbon-equivalents per year.<sup>29</sup> By comparison, the total annual number of carbon credits for 2008-2012 for all CDM projects world-wide amounted to 188 million tons.<sup>30</sup> Thus, China currently accounts for 47 percent of total CDM carbon credits usable during the 2008-2012 commitment period.

### III. THE CLIMATE PLAN'S SHORTCOMINGS ON ENVIRONMENTAL SUSTAINABILITY AND EFFECTIVENESS

The hope that China might be able to contribute significantly to limiting the rise of global greenhouse gas emissions, however, must be tempered by at least two serious concerns about the substantive implementation of the Climate Plan. First, the environmental sustainability and effectiveness of the policies set out in the Climate Plan are questionable. Second, China's approach to implementing the Clean Development Mechanism could undermine the very purposes of the Mechanism.

#### A. CONTINUED DOMINANCE OF ECONOMIC GROWTH PRIORITIES

The most pervasive influence in this regard is the continuing dominance of economic growth priorities over environmental protection and public health concerns. Even though China's programs related to climate change are encouraging, they appear to be significantly biased towards economic growth.

First, climate change policy is within the jurisdiction of the central government's National Development and Reform Commission ("NDRC"), China's designated national authority for purposes of the U.N. Framework Convention on Climate Change. Since the NDRC is one of China's leading and most powerful government agencies, placement of the issue there has elevated China's climate change policy to the highest governmental levels.<sup>31</sup>

The NDRC's primary policy focus, however, has been on promoting China's economic development and transition toward a market-oriented system. It suggests that climate change policies are first and foremost seen as economic

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28. *Id.*

29. *Id.*

30. *Id.*

31. China recently restructured its central government into a set of "super-ministries." *Highlights of China's Institutional Restructuring Plan*, XINHUA NEWS AGENCY, Mar. 15, 2008, available at [http://news.xinhuanet.com/english/2008-03/15/content\\_7797293.htm](http://news.xinhuanet.com/english/2008-03/15/content_7797293.htm). Among other government reshuffling, the reforms resulted in the formal elevation of the State Environmental Protection Administration (SEPA), China's equivalent to the U.S. Environmental Protection Agency, to full cabinet status as the new Ministry of the Environmental Protection. However, the long-term effects remain unclear. Many documents still refer to the State Environmental Protection Administration.

development policies. The trouble with this is the government's long-standing bias against strict environmental regulation—environmental quality considerations have generally been secondary to economic growth imperatives.<sup>32</sup> Thus, energy efficiency, energy conservation, and industrial modernization have been justified as a set of no-regrets measures<sup>33</sup> that will ultimately result in net benefits regardless of the actual effects of climate change.

The consequences of such a perspective can be seen in China's determined pursuit of nuclear power as a means of meeting the energy demands of its economy. While nuclear power may be a zero carbon emission energy source, serious concerns remain about long-term disposal of spent fuel and long-term environmental sustainability.<sup>34</sup> Of course, the support of some well-known Western environmentalists gravely concerned about the overwhelming long-term threat of global climate change has given nuclear power new currency worldwide as a potentially acceptable alternative to fossil fuels.<sup>35</sup>

For China, however, the significance of nuclear power lies primarily in its role as a component of an energy security strategy designed to avoid shortages of energy that could otherwise hamper the rapidly growing Chinese economy.<sup>36</sup> In other words, such policies are designed with an eye primarily toward cost and security of energy supply, and only secondarily with a view toward reducing environmental impacts, especially concerns about global climate change.<sup>37</sup>

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32. In fact, while the Ministry of Environmental Protection (formerly SEPA) is involved climate change issues, there is no formal office with responsibility for climate change issues. Discussion with senior SEPA official, Dec. 15, 2007.

33. See e.g., Zhou Dadi, *Environmental Considerations in the Development of China*, 9 ARIZ. J. INT'L & COMP. L. 221, 229-230 (1992).

34. NDRC, *supra* note 4, at 32; see also ROBERT E. EBEL, CHINA'S ENERGY FUTURE 66-68 (2005).

35. See James Lovelock, *Nuclear Power is the Only Green Solution*, INDEPENDENT, May 24, 2004, available at <http://comment.independent.co.uk/commentators/article61727.ece>; David R. Baker, *Nuclear Backers' Energy Surges*, S.F. CHRON., May 19, 2006, at D1.

36. The fragility of China's energy infrastructure was highlighted recently by the serious energy shortages and transportation disruptions caused by the wave of serious winter storms and unusually cold weather in central China. Klaudia Lee and Cary Huang, *Power plants feel the pinch as mainland weather crisis worsens*, S. CHINA MORNING POST, Jan. 29, 2008, at 1. For example, up to 800,000 migrant workers were stranded in the Guangzhou train station and unable to return to their home provinces and towns for the Chinese new year holidays because of electricity shortages Ivan Zhai, *Tempers Fray as Number Stuck in Guangzhou Nears 800,000*, S. CHINA MORNING POST, Jan. 31, 2008, at 1. The city of Chenzhou, a city of 4.6 million people in Hunan province, was left without power for nine days. Chloe Lai, *In Frozen City, They Dream of a Shower*, S. CHINA MORNING POST, Feb. 3, 2008, at 1.

37. Like its mitigation plans, China's adaptation efforts are also largely based on a no-regrets approach. For example, it is commonly known that water diversion projects such as the south-north water project, which will bring water thousands of miles from watersheds in the south to the north to meet the tremendous growth in the demand in the arid northeast, were being planned even before the UN Framework Convention on Climate Change, yet they are listed as adaptation components of the Climate Plan. See, e.g., Liu Changming, *Environmental Issues and the South-North Water Transfer Scheme*, in MANAGING THE CHINESE ENVIRONMENT 185 (Richard Louis Edmonds ed. 2000). Ironically, China's most important adaptation effort, however, is not at all designated as such in the Plan. Arguably, China's initiatives on energy efficiency, energy conservation, and industrial modernization and its more general energy security policies are China's most comprehensive set of

The question that such a regulatory policy framework raises is whether policies focused specifically and primarily on climate change and greenhouse gas emissions will be seriously considered. Furthermore, even if China formally implemented such policies, would institutional design bias or even subvert the projects?

#### B. THE TROUBLING RECORD OF CHINA'S CDM PROGRAM

Putting an economic development focused ministry in charge of climate change issues has also influenced the Clean Development Mechanism's implementation in China. The NDRC is the Designated National Authority for purposes of the CDM.<sup>38</sup> Together with the Ministry of Science and Technology ("MOST"), the NDRC also serves as the co-chair of the National CDM Board, which reviews proposals for CDM activities within China.<sup>39</sup> Jointly with the MOST and the Ministry of Foreign Affairs ("MFA"), the NDRC has the authority to approve CDM project activities.<sup>40</sup> The Ministry of Environmental Protection (MEP), formerly the State Environmental Protection Administration (SEPA), is a member of the CDM Board (together with also the Ministry of Finance, the Meteorological Administration, and the Ministry of Agriculture). Even though it is involved in the review of proposals, it is excluded from the approval decision itself.<sup>41</sup>

China's implementation of the Kyoto Protocol's CDM program has clearly been affected by this institutional arrangement. Of the worldwide number of carbon credits expected to be generated by registered CDM projects, almost half (47 percent) of will come from projects hosted in China.<sup>42</sup> Remarkably, of the China-hosted projects, 60 percent of credits will be generated by nine HFC incineration projects, each producing emissions reductions of two to ten million tons of carbon-equivalents per year.<sup>43</sup> By comparison, virtually none of the other almost 140 registered CDM project hosted by China approaches even one million credits annually. The vast majority of renewable energy and energy efficiency

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adaptation measures. Energy security is designed to ensure steady economic growth, jobs and rising prosperity, and social harmony, and as a result will provide China with more resources and resilience to respond to the effects of climate change. In other words, greater prosperity and government resources will make it easier to absorb climate change impacts. Given that policies promoting energy security are not necessarily consistent or co-extensive with greenhouse gas mitigation, such policies could support continued reliance on coal or other fossil fuels. It seems ironic that the very measures aimed at adaptation could potentially contribute to the underlying problems of climate change.

38. Measures, *supra* note 25, art. 16.

39. *Id.* art. 15.

40. *Id.* art. 16.

41. *Id.*

42. CDM data, *supra* note 26.

43. *Id.* If two other N<sub>2</sub>O destruction facilities are included, producing 14 million credits, chemical pollution destruction projects will account for close to 68 million credits or slightly over 75 percent of all China-based registered CDM projects. *Id.*

projects usually generate in the range of a few tens of thousands to a few hundred thousand carbon credits.

The driving force behind these mega-CDM projects (in terms of carbon credits), compared to the traditional renewable energy and energy efficiency project activities, is the relatively cheap technology that can be put into place to generate valuable carbon credits. Assuming carbon prices of US\$10/ton, an investment of a few million dollars could result in credits worth between US\$100-500 million over the course of Kyoto's five-year commitment period. Even when the 65 percent tax on the revenue of such projects is taken into account, such projects remain profitable investments.

Thus, the great majority of CDM credits generated in China come from a handful of projects that are focused on chemical pollutant destruction, rather than the development of renewable energy resources or energy efficiency improvements. To put this issue most starkly: eleven projects in China, accounting for just 1 percent of the total number of CDM projects, will generate 36 percent of all annual CDM carbon credits in the world.<sup>44</sup> Without even questioning assumptions about the true equivalence of carbon credits generated by chemical pollutant destruction processes with actual carbon dioxide emissions, the sheer number of credits generated by a handful of relatively cheap projects raises troubling concerns about the long-term value of such projects with respect to climate change mitigation.

First, given the large disparity in profitability between HFC-23 projects and that of traditional renewable energy and energy efficiency projects, the large numbers of cheap carbon credits generated could depress the market price for carbon credits. There seems to be a real risk that such mega-projects will siphon off scarce CDM investment dollars from emission reduction activities elsewhere, especially in other developing countries.<sup>45</sup> It could also reduce the incentives to undertake more conventional GHG mitigation projects, such as development of alternative energy resources. Conventional projects might be less economically attractive; nevertheless, renewable resource development, energy efficiency improvements, and the development of new technologies would speed up a transition to an economy less dependent on fossil fuels.<sup>46</sup> Thus, investment

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44. As of January 1, 2008, there were 890 world-wide projects generating 188 million credits annually. *Id.*

45. There is also the question whether China needs all of the CDM foreign investment dollars in the first instance, given that one of the CDM's key functions is to promote sustainable development in the developing world. China already has significant streams of foreign investment pouring into its economy and has significant domestic capacity for investment in its economy. In contrast, Africa has had comparatively small amount of CDM activity even though it arguably has had greater need for foreign investment to assist with economic development and poverty alleviation. In fact, the efforts of the Chinese government to strengthen diplomatic relationships with African countries in recent years by providing development aid and directing China's own foreign investment to such nations bolsters this perspective.

46. Implementation of energy efficiency programs and renewable energy facilities also have the potential to serve as demonstration projects show-casing their economic viability, environmental advantages, and desirability. In contrast, the HFC-23 destruction technology arguably is utilizable only in a relatively concentrated

dollars targeting renewable energy sources or energy efficiency could have environmental benefits promoting sustainable and cleaner development reaching far beyond the short-term effect of generating carbon credits. The impact on shaping the pathway of industrial development and technology adoption toward long-term sustainability of energy consumption could be substantial.

As Michael Wara has also suggested, the unexpectedly large profits that can be made from HFC destruction might provide perverse incentives to *produce* such waste gases primarily for the carbon credits they generate rather than as a by-product of actual demand for the associated good (HCFCs) that can be sold for useful purposes in the marketplace.<sup>47</sup> The unintended consequence would not only create unjustified windfall profits, but impede other efforts to mitigate GHG emissions by diluting the value of CDM carbon credits.<sup>48</sup>

Ultimately, the huge profits to be made from a few HFC-23 incineration projects raise the question of whether the Kyoto Protocol parties might have been much better off adopting the traditional environmental financing model. Under the Montreal Protocol and the Global Environmental Facility model, direct subsidy payments to China could have paid for such projects without distorting the carbon market and at a price much closer to the actual cost of the pollution destruction equipment. The international community and the Kyoto Protocol parties could have captured the environmental benefit of such projects and allowed scarce environmental investments to be directed to other emission reduction opportunities with a greater need for foreign capital investment.

China has pledged in its CDM regulations to direct the 65 percent of the CDM credits generated by HFC projects to support other activities on climate change.<sup>49</sup> However, how such money will be specifically used is still unclear. Plans are to be formulated primarily by the Ministry of Finance and NDRC, though “other relevant departments,” presumably the Ministry of Environmental Protection, will be involved.<sup>50</sup>

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industry and has limited climate change-related application in other parts of the economy.

47. Michael Wara, *Measuring the Clean Development Mechanism's Performance and Potential* 28-31 (Program on Energy & Sustainable Dev. at Stanford Univ. Working Paper No. 56, July 2006), available at [http://iis-db.stanford.edu/pubs/21211/Wara\\_CDM.pdf](http://iis-db.stanford.edu/pubs/21211/Wara_CDM.pdf).

48. *Id.* at 28.

49. The “Clean Development Mechanism Fund [will] support the country’s activities on climate change such as climate change related science and technology research, and raising national adaptation and mitigation capacity.” NDRC, *supra* note 4, at 57. See also Measures, *supra* note 25, art. 24 (“to support the country’s activities on climate change such as climate change related science and technology research, and raising national adaptation and mitigation capacity”).

50. In the best case situation, such funds could help implement and subsidize other climate change programs in China. However, given concerns about corruption and other weaknesses of China’s environmental regulatory system generally, it is unclear how effectively the Ministry of Finance will be in selecting worthy programs and administering such a fund.

#### IV. THE UNCERTAIN PROSPECTS OF THE CLIMATE PLAN'S REGULATORY IMPLEMENTATION

In addition to concerns about the substantive effectiveness and environmental sustainability of China's Climate Plan in contributing to global GHG mitigation efforts, there is also considerable uncertainty about China's ability to implement and ensure compliance with the Plan through its existing regulatory policies and institutional structures. As experience with environmental regulation generally has shown, compliance and cooperation with mandates to reduce energy use, purchase energy efficient equipment, or install and operate climate friendly equipment is unlikely to happen on a voluntary basis. Regulatory implementation will be necessary, whether through the design of licensing, inspection, monitoring, and enforcement systems or through the provision of economic incentives.

China's Climate Plan anticipates these needs by providing, for example, that China will "strengthen supervision and monitoring on energy conservation" with respect to energy efficiency and conservation improvements. Such regulatory steps will:

- phase out backward and energy intensive productions and equipments according to the law, . . . ;
- prohibit producing, importing, and selling products that fail to meet the lowest energy efficiency standards, and forbid selling and using buildings that fail to meet the energy-saving building design standards;
- strengthen the supervision and monitoring of energy utilization status of key energy consumer entities;
- strengthen supervision of energy utilization status of energy intensive industries, government office buildings, and large-scale public buildings;
- strengthen the inspection of the implementation of energy efficiency standards for products, building energy-saving design standards and industry design criterions.<sup>51</sup>

The need to create or modify regulatory systems implementing the central government's Climate Plan reaches even deeper. Regulations or new laws are expected to mandate technologies or processes to be adopted by various industrial sectors.<sup>52</sup> The Climate Plan also calls for the strengthening and improved implementation of various environmental laws and regulations related to agriculture, forestry, and municipal wastes,<sup>53</sup> including strict control of land reclamation activities in fragile ecosystems and prohibition of pasture destruction.<sup>54</sup>

Unfortunately, China's track-record in implementing environmental and other

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51. NDRC, *supra* note 4, at 36-37.

52. *Id.* at 39, 40 (saying, for example, that "coke ovens should be equipped with coke dry quenching facilities," and "ethylene cracking furnaces with advanced technology shall be retrofitted").

53. *Id.* at 44-46.

54. *Id.* at 44.

regulatory schemes advancing the public interest has not been good. Even though China's environmental protection system is made up of a fairly extensive and modern set of laws and regulations,<sup>55</sup> based in large part on the systems of the United States and Western Europe, it is poorly implemented and enforced.<sup>56</sup> Other regulatory systems safeguarding consumer and worker safety suffer from similarly deficient implementation and enforcement.<sup>57</sup>

One illustration can be found in the difficulties China has faced in improving environmental quality in anticipation of the 2008 Beijing Olympics. As part of its commitments to win the Olympic bid, China vowed to clean up the skies over the city and reduce other pollution, making the city "as clean as Paris."<sup>58</sup> China has taken many steps to clean the air, with some substantive success.<sup>59</sup> However, serious air quality issues remained until the beginning of the Olympics, when drastic temporary measures, shutting down factories, stopping construction, and keeping cars off the road, finally were effective in clearing the air.<sup>60</sup> Some athletes planned to take precautionary measure to ensure that pollution will not seriously impair their performance and health.<sup>61</sup>

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55. See Wang Canfa, *Chinese Environmental Law Enforcement: Current Deficiencies and Suggested Reforms*, 8 VT. J. ENVTL. L. 159, 161-62 (2006-07). See generally STATE ENVTL. PROT. ADMIN., ENVIRONMENTAL LAWS & REGULATIONS IN CHINA AND RULES OF WTO (Chinese-English Version) (2002).

56. Anecdotal evidence indicates that even when modern pollution control equipment has been purchased or even installed, businesses may choose not to operate or turn off such equipment in order to save costs.

57. For example, a slew of media reports in 2007 exposed reliability problems related to China's food safety system even though existing laws should have prevented incidents of contaminated toothpaste, adulterated pet foods, and unsafe food products. The lack of effectiveness of China's regulatory system overseeing coal miner safety, illustrated at times by weekly reports of mining disasters claiming tens and occasionally even hundreds of lives, is an even starker example of the more general problem. Over 6,000 miners die annually in China's coal mines, more than 100 times the rate of coal mining deaths in the United States. See Mure Dickie, *World's Riskiest Mines Claim 200 Lives*, FIN. TIMES, Feb 16, 2005, at 10; Mure Dickie, *Chinese Miners Learn to Live with Danger*, FIN. TIMES, Dec. 21, 2004, at 20. And while illegal and unsafe mines are shut-down all the time, most of such mines re-open after the inspectors leave.

58. Zhu Baoxia, *Nation Set to Further Cut Pollutants*, CHINA DAILY, Dec. 23, 2000. In fact, during the evaluation of Beijing's bid for the 2008 Olympics, International Olympic Committee officials indicated that they expected air and water quality "to be within WHO [World Health Organization] standards at all venues, and in Beijing generally." INT'L OLYMPIC COMM., REPORT OF THE IOC EVALUATION COMMISSION FOR THE GAMES OF THE XXIX OLYMPIAD IN 2008, at 62 (April 3, 2001). That appears rather doubtful at this point.

59. See Jim Yardley, *Beijing's Olympic Quest: Turn Smoggy Sky Blue*, N.Y. TIMES, Dec. 29, 2007, at A1; Jim Yardley, *China Reveals Backup Pollution Controls*, N.Y. TIMES, Aug. 1, 2008, at A6. Some argued that attempts to improve air quality had led to a slower economic growth rate for July, 2008 (14.7 percent), but others were skeptical. See Andrew Batson, "Are Clean-Air Measures Slowing China's Growth?," *China Journal* (Aug. 14, 2008) (last visited Aug. 14, 2008), <http://blogs.wsj.com/chinajournal/2008/08/14/are-clean-air-measures-slowing-chinas-growth/>.

60. See Juliet Macur, *Reviews of Air Quality Are Mixed, and So Is Attendance*, N.Y. TIMES, Aug. 8, 2008 (noting praise from International Olympic Committee but also some dissenting views); Jim Yardley, *More Than Halfway Through the Games, a Rarity for Beijing: A Breath of Fresh Air*, N.Y. TIMES, Aug. 18, 2008, at A7.

61. Ariana Eunjung Cha, *Olympic Teams Prepare for Dirty Air in Beijing*, WASH. POST, Jan. 24, 2008, at A1. The U.S. Olympic Committee prepared to bring some of the food American athletes consumed from the U.S. to China, so as to avoid contamination problems. Ben Shpiel, *Wary of Food, U.S. Olympians Plan a Big Delivery to China*, N.Y. TIMES, Feb. 9, 2008, at A1.

Although the specter of athletes with breathing masks did not materialize – with a few notable exceptions<sup>62</sup> – China's difficulty in meeting its promises are not due to a lack of genuine desire and good faith.<sup>63</sup> Instead, the reasons for these failures are the result of deep structural and institutional deficits in the environmental regulatory scheme and system of governance. They are serious impediments to improving China's environment that even the edicts from the very top leadership, without more, cannot readily overcome.<sup>64</sup>

The obstacles to improving the effectiveness of China's environmental regulatory system can be broadly classified into four interrelated sets of issues. First, there is "local protectionism" and a conflicting set of incentives that usually lead local governments to choose economic growth and pollution over public health and environmental quality considerations.

"Local protectionism" describes the tendency of government leaders to shield local businesses from the burdens of environmental regulatory requirements, including enforcement actions.<sup>65</sup> Because promotions and bonuses for local leaders, who are not politically accountable to local communities, have in the past been based on their performance in meeting economic growth goals, local leaders have commonly preferred economic growth and pollution over community concerns about public health and the environment.<sup>66</sup> More insidiously, corruption and conflicts of interests due to financial ties with regulated businesses can result in local protectionism.<sup>67</sup> The relatively low prestige and influence of environmental protection officials, compared to their economic development counterparts,

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62. See Greg Bishop, *When It Comes to Masks, Cyclists Are Still Apologizing*, N.Y. TIMES, Aug. 12, 2008, <http://www.nytimes.com/2008/08/13/sports/olympics/13cycling.html> (last visited Sep. 27, 2008). (describing controversy over four members of U.S. cycling team).

63. In fact, the government has been reported to contemplate banning half of the city's cars and asking various industries to shut down for the duration of the Olympic Games in order to improve air quality. See, e.g., Martin Zhou, *Building Sites Ordered to Stop Work in Bid to Improve Games Air Quality*, S. CHINA MORNING POST, Mar. 13, 2008. Even if these efforts are successful, such actions are not a sustainable method of addressing Beijing's poor quality.

64. While central government ministries have recently been reshuffled, there appear to be no plans to drastically alter the governance structures relevant to environmental regulation. Jim Yardley, *China Retools Its Government in a Rush for Efficiency*, N.Y. TIMES, Mar. 12, 2008, at A12.

65. ORG. FOR ECON. COOP'N & DEV., CHINA IN THE GLOBAL ECONOMY: GOVERNANCE IN CHINA 508-509 (2005); DALI L. YANG, REMAKING THE CHINESE LEVIATHAN: MARKET TRANSITION AND THE POLITICS OF GOVERNANCE IN CHINA 96-97 (2004).

66. There are exceptions, and some local EPBs are more progressive than others. See, e.g., ELIZABETH C. ECONOMY, THE RIVER RUNS BLACK: THE ENVIRONMENTAL CHALLENGE TO CHINA'S FUTURE 117-18 (2004).

67. While China has laws and regulations that prohibit corruption and try to forestall self-interested behavior, such issues continue to arise regularly. Periodic campaigns of the central government to root out corruption and conflicts of interest have had only limited success. See generally YANG, *supra* note 64, at 217-258. See also JOHN BRYAN STARR, UNDERSTANDING CHINA: A GUIDE TO CHINA'S ECONOMY, HISTORY, AND POLITICAL STRUCTURE 139-141 (2001). The most recent example of high-level corruption was the conviction and execution of the head of China's Food and Drug Administration. David Barboza, *A Chinese Reformer Betrays his Cause, and Pays*, N.Y. TIMES, July 13, 2007, at A1.

has exacerbated the problem of political interference.<sup>68</sup>

Apart from outside pressures, local environmental protection bureau ("EPB") officials also face conflicting incentives with respect to regulatory enforcement even though they are charged with protecting the environment and reducing pollution. For example, the pollution discharge fee system arguably gives EPBs a stake in the continuation of excess pollution discharges.<sup>69</sup> Under the discharge fee system, EPBs receive a portion of the fee paid by polluters for discharges in excess of applicable standards, which are used in part to fund EPB activities.<sup>70</sup> As a result, the pollution discharge fee system has created a perverse incentive for EPBs to allow excess pollution emissions.<sup>71</sup> The consequence is that environmental concerns often have to give way to economic considerations.

The second set of problems relates to the challenge faced by the central government and the Ministry of Environmental Protection (MEP) in controlling the activities of local and provincial governments on environmental matters. Even though MEP is formally vested with the central government's supervisory authority on pollution related matters, it has had only limited success in getting the EPBs of local and provincial governments to properly implement and enforce national environmental laws and regulations.

MEP's weak ability to control the actions of local EPBs results from direct local<sup>72</sup> governmental control over personnel management and budgets in the respective EPBs as well as improper interference by other government agencies and politicians. MEP may have general authority over the environmental laws and regulations implemented by local EPBs, but the budgets and personnel of local EPBs are under the direct control of the respective local governments. Thus, hiring, firing, and promotions of EPB staff are controlled not by MEP but rather by the respective local officials. Allegiance of EPB personnel is divided, affecting

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68. See, e.g., Abigail R. Jahiel, *The Organization of Environmental Protection in China*, in *MANAGING CHINA'S ENVIRONMENT* 42-47 (Richard Louis Edmonds ed., 2000); XIAOYING MA & RICHARD ORTELLANO, *ENVIRONMENTAL REGULATION IN CHINA* 80-82 (2000); see also Shi Jiangtao, *Upgrade Gives Watchdog more Clout in Pollution Fight*, S. CHINA MORNING POST, Mar. 13, 2008.

69. Zhonghua Renmin Gongheguo Huanjing Baohu Fa [Environmental Protection Law of the People's Republic of China], art. 28 (adopted on Dec. 26, 1989), translated in *CHINESE L. & GOV'T*, May/June 2004, at 58 [hereinafter *Environmental Protection Law*] ("Enterprises and institutions discharging pollutants in excess of the prescribed national or local discharge standards shall pay a fee for excessive discharge according to state provisions.").

70. MA & ORTELLANO, *supra* note 68, at 21-24, 122-26; State Council, *Interim Measures on the Collection of Pollution Discharge Fee* (Feb. 5, 1982), reprinted in *STATE ENVIRONMENTAL PROTECTION ADMINISTRATION, ENVIRONMENTAL LAWS & REGULATIONS IN CHINA AND RULES OF WTO*, 417 (Chinese-English Version) (2002).

71. See *ECONOMY*, *supra* note 66, at 111. There are provisions in other environmental regulatory systems that appear to create disincentives for local government officials to protect environmental quality. Gu Dejin, Presentation on The Centralization and Decentralization in Environmental Governance at the Environmental Law Institute, Jan. 24, 2008 (unpublished transcript available with the Environmental Law Institute).

72. Provincial governments are commonly referred to and included as "local" governments, and hence the term local governments and local EPBs should be seen as including provincial governments and provincial EPBs, unless otherwise indicated.

regulatory and enforcement decisions accordingly.<sup>73</sup>

From an American perspective, such difficulties seem surprising. Compared to the U.S. federal system, where state governments are sovereigns unto themselves, China has a unitary governmental structure. Provincial and local governments derive their legal and governmental authorities from the central government and are therefore responsible as Beijing's agents for implementation of national laws. Unlike in the American federal system, local and provincial authorities cannot assert governmental sovereignty as a basis for refusing to carry out national legal mandates. Moreover, China's environmental laws and regulations impose penalties for neglect of official duties.<sup>74</sup> Therefore, local officials should arguably be more responsive than their American counterpart.

Decisions and actions by local EPBs can be reviewed by MEP and potentially altered. However, MEP does not have adequate financial and human resources to supervise the day-to-day operations of local EPBs to ensure consistent implementation of national laws and regulations. Nor can MEP supervise industry compliance with environmental requirements by itself. MEP has 200-300 full-time employees to supervise the thousands of local and provincial EPBs that manage the environment for a population of 1.3 billion people.<sup>75</sup> With respect to enforcement matters, the number of staff directly assigned to that office numbers approximately thirty.<sup>76</sup> By comparison, U.S. EPA has 17,000-18,000 employees in Washington, DC headquarters and twelve regional offices, with hundreds of staff involved in enforcement work.<sup>77</sup>

A third set of issues relates to China's deficit of democratic governance. China remains a country that lacks open and fair elections, making government officials, including their actions with respect to the environment, unaccountable through democratic processes. At the same time, other avenues by which the public can participate in environmental decision-making remain underdeveloped.

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73. Many of these issues are not unique to China's environmental regulatory system, however. Attempts by government officials to interfere with environmental regulatory and enforcement processes are common in many countries, including in the U.S. The tension between efforts to protect the public health and the environment and concerns about economic impacts surface regularly in policy debates and regulatory processes across the world. Unfortunately, the overall set of incentives and pressures, including the design of specific regulatory schemes, has made it much less likely that local EPBs will vigorously enforce national environmental laws. Gu Dejin, *supra* note 71.

74. See, e.g., Environmental Protection Law, *supra* note 69, art. 45.

75. However, Daniel Guttman has pointed out, there are one to two thousand additional staff employed by affiliated institutes, primarily involved in planning and education. Dan Guttman & Song Yaquin, *Making Central-Local Relations Work: Comparing America and China Environmental Governance Systems*, 1 FRONTIERS ENVTL. SCI. & ENGINEERING CHINA 418, at 427 (2007).

76. Personal communication with MEP official. There are also a couple of hundred staff in affiliated centers working on enforcement matters.

77. Elizabeth Economy has suggested that this also true for local environmental protection bureaus more generally. Elizabeth Economy, *Environmental Enforcement in China*, in CHINA'S ENVIRONMENT AND THE CHALLENGE OF SUSTAINABLE DEVELOPMENT 102, 107 (Kristen Day ed., 2005). See also ECONOMY, *supra* note 66, at 107.

For example, the activities of environmental non-governmental organizations (“NGOs”), which have been so important in many countries to asserting the public’s interest in public health and environmental protection, are strictly controlled in China. China requires all NGOs to be registered and sponsored or affiliated with a government agency.<sup>78</sup> The licensing requirement in essence allows for governmental control and supervision of environmental organizations, restricting what entities can be created or allowed to exist legitimately as well as allowing for some supervision of their activities.

The policy limits the number of environmental NGOs and favors NGOs that tend to focus on activities and issues unlikely to draw government scrutiny. Involvement in controversial issues tends to be uncommon among Chinese environmental NGOs. Organizations that focus on advocacy work, such as the Center for Legal Assistance to Pollution Victims, in Beijing, are even more rare.

In recent years, government officials have come to accord a greater recognition to public participation as an important priority within environmental law, particularly with respect to environmental impact assessments.<sup>79</sup> Much too often, however, the public continues to have little ability to influence government actions, short of staging widespread protests and expressing serious popular dissatisfaction.<sup>80</sup>

The fourth set of issues is the weakness of the rule of law and supporting legal institutions. China’s environmental legal framework and institutions provide only weak support to environmental NGOs or private individuals interested in engaging government agencies on environmental issues or in taking actions against polluters. First, entities that would ordinarily support the development and implementation of environmental law in other countries such as the U.S., especially the practicing bar, are largely absent in this field. Traditionally, the leading law firms in China have not had practice specializations in environmental law, not even environmental compliance work.<sup>81</sup> Without consistent and sustained government enforcement efforts, the opportunities for an environmental bar to practice its trade will continue to be limited.

Second, the institutions of the law, especially the courts, lack independence. Of course, unlike in the United States, the courts are not intended to be independent institutions.<sup>82</sup> Instead, like all other Chinese government institutions, the courts

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78. As a result, such organizations are also commonly referred to as Government-organized Non-governmental Organizations (“GONGOs”).

79. See, e.g., Jesse Moorman & Zhang Ge, *Promoting and Strengthening Public Participation in China’s Environmental Impact Assessment Process: Comparing China’s EIA Law and U.S. NEPA*, 8 VT. J. ENVTL. L. 281, 284 (2007).

80. See Benjamin Kang Lim, *Thousands Protest Against South China Chemical Plant*, REUTERS, June 1, 2007, available at <http://www.reuters.com/article/latestCrisis/idUSPEK112258>.

81. According to one Chinese law student’s summer research project in 2006, none of the top 40 Chinese law firms had any environmental law practice.

82. For example, members of the federal judiciary are nominated by the President and confirmed by the

are accountable and must report to the legislative bodies at each level of government.<sup>83</sup> Thus, the Supreme People's Court's actions are supervised by the National People's Congress. Moreover, similar to some other civil law systems, Chinese courts function much like bureaucratic administrative agencies. Judges play roles more akin to civil servants than decision-makers with significant independence and authority. They are subject to the authority of local governmental leaders, opening up the risk of the improper use of such power to influence cases.<sup>84</sup> Judicial corruption remains a threat as well.<sup>85</sup>

Third, there continues to be a deficit in the substantive understanding of environmental laws and the underlying policies among the environmental bar, environmental officials, and the courts. In general, environmental law has been and continues to be a disfavored specialty area within China's law schools. Instead, commercial law or other legal fields that enable law graduates to engage in lucrative law practices tend to be the most popular with students by wide margins.<sup>86</sup> Combined with few opportunities to practice environmental law, the result is that lawyers tend not to develop an expertise in the area.

Among judges, lack of training focused on environmental law is exacerbated oftentimes by a more general lack of training in the law. During the downsizing of the People's Liberation Army some years ago, the courts were often a favored destination for retired military officers, even for those who had no formal training in law.<sup>87</sup> Likewise, government positions in EPBs have at times been treated like economic opportunities for government employment regardless of qualification, rather than being openings for highly-trained professionals. However, legal training among such employees has increased because of recognition that environmental law expertise is an importance competency for such positions.

As currently drafted, China's Climate Plan relies heavily on the existing environmental regulatory system to achieve its goals. If that regulatory system is considered inadequate, that poses serious concerns for effective implementation. Even with regard to energy efficiency and conservation policies and industrial restructuring efforts, regulatory implementation and enforcement will be no less important. As Professor Mingyuan Wang has pointed out, not only has implemen-

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United States Senate. These federal judges, who hear the majority of the cases brought under federal environmental legislation, have the authority to independently overrule unlawful actions by either of the other co-equal branches of the federal government.

83. In that sense, China resembles a parliamentary governmental system.

84. See Jerome Cohen & John Lange, *The Chinese Legal System: A Primer for Investors*, 17 N.Y.L. SCH. J. INT'L & COMP. L. 345, 351 (1997).

85. See, e.g., Margaret Y. K. Woo, *Law and Discretion in Contemporary Chinese Courts*, in *THE LIMITS OF THE RULE OF LAW IN CHINA* 169-70 (Karen G. Turner et al. eds., 2000).

86. In addition, China's legal system still allows the practice of law based primarily on passage of a national bar exam, even without formal study of law. Environmental law is an unlikely area for self-study lawyers to focus on.

87. See, e.g., *ECONOMY*, *supra* note 66, at 113.

tation and enforcement of past energy-related legislation<sup>88</sup> been inadequate, but similar concerns continue to plague the most recently enacted energy legislation, the 2005 Renewable Energy Law.<sup>89</sup> There are serious deficiencies related to the legislation's lack of specificity and "incompleteness" of the regulatory design. But there are also more familiar problems of democratic governance, the weakness of the rule of law and its supporting institutions, corruption and conflict of interest, and local protectionist tendencies that are analogous to the traditional environmental regulatory context.<sup>90</sup>

#### V. POSSIBILITIES FOR MEETING THE CHALLENGES

These issues present very serious challenges to the accomplishment of environmental goals by the central government. Because the difficulties are grounded in institutional deficiencies, solutions need to address such weaknesses of institutional culture and capacity.

The primacy of economic development objectives, which has led officials to put economic growth ahead of environmental quality and public health concerns, has turned climate change policy into an energy security and supply policy.<sup>91</sup> Reversing the tendency of government policies to under-value the potential long-term consequences for environmental health and natural resource harm will require far-reaching changes in institutional culture and beliefs. In effect, China's climate change policy must be transformed or acquire much more of the characteristics of an environmental and public health policy.

At the same time, capacity building and institutional reform is still necessary with respect to China's environmental regulatory system. For example, expanding the teaching of environmental law in Chinese law schools, along with training programs for lawyers, judges, and government officials, could make a significant difference with respect to the lack of knowledge and understanding of governing environmental legal principles among the practicing bar, judges, and government officials.<sup>92</sup>

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88. Electric Power Law (promulgated by the Standing Comm. Nat'l People's Cong., Dec. 28, 1995, effective Apr. 1, 1996), ISINOLAW (last visited Aug. 11, 2008) (P.R.C.); Energy Conservation Law of the People's Republic of China (promulgated by the Standing Comm. Nat'l People's Cong., Nov. 1, 1997, effective Jan. 1, 1998).

89. The Renewable Energy Law of the People's Republic of China (promulgated by the Standing Comm. Nat'l People's Cong., effective Jan. 1, 2006).

90. Wang Mingyuan, *Issues Related To The Implementation Of China's Energy Law: Analysis Of The Energy Conservation Law And The Renewable Energy Law As Examples*, 8 VT. J. ENVTL. L. 225 (2007).

91. For the first time in China's history, pollution reduction goals have been incorporated into China's most recent 5-year Plan, which calls for 10% reduction of major air and water pollutants released nationwide. *China's Main Targets for 2006-2010*, CHINA DAILY, Apr. 14, 2006, [http://www.chinadaily.com.cn/bizchina/2006-04/14/content\\_567934.htm](http://www.chinadaily.com.cn/bizchina/2006-04/14/content_567934.htm). However, it remains to be seen how effectively this mandate will be implemented.

92. The court system could be affected relatively quickly by such an approach because most judges are hired and promoted like other government civil servants. As a result new judges tend to be new or recent law school graduates.

The overall impact of such training would increase the capacity of the bar and the courts to properly handle environmental cases when they arise. With respect to EPB staff, training could also improve and professionalize environmental law implementation and enforcement. The outcome could be both greater consistency with, and fidelity to, the applicable regulatory scheme. Most importantly, however, increased levels of implementation enforcement would result in a greater demand for environmental legal services and cases that would in turn spur demands on the practicing bar and improve the familiarity, and eventually the expertise, of the courts in environmental matters. China's regulatory system will also need to realign the incentives of polluters and local environment EPB officials to protect the environment and carry out national regulatory and legal mandates.

Other challenges may be more difficult to address. MEP's financial and human resources are inadequate to properly supervise thousands of local EPBs or to manage the pollution and environmental degradation problems when local EPBs fail to do so.<sup>93</sup> Despite its reluctance, China's central government will ultimately have to endow MEP with a much greater set of financial and human resources.<sup>94</sup>

China will also need to provide judges with greater independence from undue influence by other officials and the parties so as to assure the integrity of judicial decisions. While the issue is representative of larger concerns about the rule of law, it is of special importance to environmental cases. In their nature, environmental disputes usually implicate not only the concerns of particular injured victims but also the larger public interest in environmental quality and a set of diffuse public health impacts. At the same time, the targets of environmental law claims are usually made up of entities with concentrated economic interests. The result is that the dynamics of litigating environmental cases raises public choice and collective action issues that tend to bias outcomes in favor of polluters. A neutral and independent judiciary is thus crucial to ensuring an outcome that protects the public interest.

Finally, NGOs and other civil society organizations (including universities and other educational institutions), need greater independence from governmental control in order to play a significant role in protecting the environment and holding polluters and the government accountable for their actions. Yet, relinquish-

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93. The authority to punish local officials for neglecting their duties has generally has been of little effectiveness in part because such punishments are inconsistently imposed. *See, e.g.,* STARR, *supra* note 67, at 139-141.

94. There have also been suggestions for "verticalization" of control over local EPBs. Verticalization would mean putting the budgets and personnel directly under the control of MEP and eliminate conflicting loyalties of EPB staff and ability to manipulate EPB activities by local government officials. *See* Gu Dejin, *supra* note 71. The effect would be to put the activities of local EPBs under direct control of SEPA, in effect "nationalizing" what have traditionally been local government officials. Such a change would have to come with a wholesale shift of revenue from local governments to the central government in order to ensure appropriate funding of local EPBs.

ing control over NGOs, by, for example, abolishing licensing requirements, would also mean allowing such organizations to challenge official policies. Not surprisingly, the Chinese government has been reluctant to decrease governmental oversight.

Institutional concerns about China's implementation of any future GHG emission limits also suggest an important area of activity for the U.S. and other industrialized nations. In addition to negotiating with central government and foreign affairs officials about the need of China to take on formal GHG emission limits, governments should also engage China directly in the regulatory implementation of any commitments or voluntary initiatives to mitigate greenhouse gas emissions. Such efforts will be difficult and require patience and persistence. But they are likely to have much greater substantive effects and will be more important than international agreements setting numerical emission targets.

#### CONCLUSION

Many of China's efforts, especially its energy conservation and efficiency measures, are contributing to important greenhouse gas emission reductions. However, very serious challenges lay ahead with respect to the "nitty-gritty" of ensuring appropriate implementation of China's energy, environmental, and CDM programs. Efforts focused on resolving such issues will make China's ongoing climate change efforts and environmental regulatory system much more effective. More importantly, reforms will also ensure China's ability to comply with internationally binding emission limits, should China take on those commitments. Otherwise, even a successful Bali Plan negotiation leading to the inclusion of China among countries with fixed emission limits will be of limited value and effectiveness.

