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## The Great Leap Backward?

By Elizabeth C. Economy

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Summary: China's environmental woes are mounting, and the country is fast becoming one of the leading polluters in the world. The situation continues to deteriorate because even when Beijing sets ambitious targets to protect the environment, local officials generally ignore them, preferring to concentrate on further advancing economic growth. Really improving the environment in China will require revolutionary bottom-up political and economic reforms.

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China's environmental problems are mounting. Water pollution and water scarcity are burdening the economy, rising levels of air pollution are endangering the health of millions of Chinese, and much of the country's land is rapidly turning into desert. China has become a world leader in air and water pollution and land degradation and a top contributor to some of the world's most vexing global environmental problems, such as the illegal timber trade, marine pollution, and climate change. As China's pollution woes increase, so, too, do the risks to its economy, public health, social stability, and international reputation. As Pan Yue, a vice minister of China's State Environmental Protection Administration (SEPA), warned in 2005, "The [economic] miracle will end soon because the environment can no longer keep pace."

With the 2008 Olympics around the corner, China's leaders have ratcheted up their rhetoric, setting ambitious environmental targets, announcing greater levels of environmental investment, and exhorting business leaders and local officials to clean up their backyards. The rest of the world seems to accept that Beijing has charted a new course: as China declares itself open for environmentally friendly business, officials in the United States, the European Union, and Japan are asking not whether to invest but how much.

Unfortunately, much of this enthusiasm stems from the widespread but misguided belief that what Beijing says goes. The central government sets the country's agenda, but it does not control all aspects of its implementation. In fact, local officials rarely heed Beijing's environmental mandates, preferring to concentrate their energies and resources on further advancing economic growth. The truth is that turning the environmental situation in China around will require something far more difficult than setting targets and spending money; it will require revolutionary bottom-up political and economic reforms.

For one thing, China's leaders need to make it easy for local officials and factory owners to do the right thing when it comes to the environment by giving them the right incentives. At the same time, they must loosen the political restrictions they have placed on the courts, nongovernmental organizations (NGOs), and the media in order to enable these groups to become independent enforcers of environmental protection. The international community, for its part, must focus more on assisting reform and less on transferring cutting-edge technologies and developing demonstration projects. Doing so will mean diving into the trenches to work with local Chinese officials, factory owners, and environmental NGOs; enlisting international NGOs to help with education and enforcement policies; and persuading multinational corporations (MNCs) to use their economic leverage to ensure that their Chinese partners adopt the best environmental practices.

Without such a clear-eyed understanding not only of what China wants but also of what it needs, China will continue to have one of the world's worst environmental records, and the Chinese people and the rest of the

world will pay the price.

## SINS OF EMISSION

China's rapid development, often touted as an economic miracle, has become an environmental disaster. Record growth necessarily requires the gargantuan consumption of resources, but in China energy use has been especially unclean and inefficient, with dire consequences for the country's air, land, and water.

The coal that has powered China's economic growth, for example, is also choking its people. Coal provides about 70 percent of China's energy needs: the country consumed some 2.4 billion tons in 2006 -- more than the United States, Japan, and the United Kingdom combined. In 2000, China anticipated doubling its coal consumption by 2020; it is now expected to have done so by the end of this year. Consumption in China is huge partly because it is inefficient: as one Chinese official told *Der Spiegel* in early 2006, "To produce goods worth \$10,000 we need seven times the resources used by Japan, almost six times the resources used by the U.S. and -- a particular source of embarrassment -- almost three times the resources used by India."

Meanwhile, this reliance on coal is devastating China's environment. The country is home to 16 of the world's 20 most polluted cities, and four of the worst off among them are in the coal-rich province of Shanxi, in northeastern China. As much as 90 percent of China's sulfur dioxide emissions and 50 percent of its particulate emissions are the result of coal use. Particulates are responsible for respiratory problems among the population, and acid rain, which is caused by sulfur dioxide emissions, falls on one-quarter of China's territory and on one-third of its agricultural land, diminishing agricultural output and eroding buildings.

Yet coal use may soon be the least of China's air-quality problems. The transportation boom poses a growing challenge to China's air quality. Chinese developers are laying more than 52,700 miles of new highways throughout the country. Some 14,000 new cars hit China's roads each day. By 2020, China is expected to have 130 million cars, and by 2050 -- or perhaps as early as 2040 -- it is expected to have even more cars than the United States. Beijing already pays a high price for this boom. In a 2006 survey, Chinese respondents rated Beijing the 15th most livable city in China, down from the 4th in 2005, with the drop due largely to increased traffic and pollution. Levels of airborne particulates are now six times higher in Beijing than in New York City.

China's grand-scale urbanization plans will aggravate matters. China's leaders plan to relocate 400 million people -- equivalent to well over the entire population of the United States -- to newly developed urban centers between 2000 and 2030. In the process, they will erect half of all the buildings expected to be constructed in the world during that period. This is a troubling prospect considering that Chinese buildings are not energy efficient -- in fact, they are roughly two and a half times less so than those in Germany. Furthermore, newly urbanized Chinese, who use air conditioners, televisions, and refrigerators, consume about three and a half times more energy than do their rural counterparts. And although China is one of the world's largest producer of solar cells, compact fluorescent lights, and energy-efficient windows, these are produced mostly for export. Unless more of these energy-saving goods stay at home, the building boom will result in skyrocketing energy consumption and pollution.

China's land has also suffered from unfettered development and environmental neglect. Centuries of deforestation, along with the overgrazing of grasslands and overcultivation of cropland, have left much of China's north and northwest seriously degraded. In the past half century, moreover, forests and farmland have had to make way for industry and sprawling cities, resulting in diminishing crop yields, a loss in biodiversity, and local climatic change. The Gobi Desert, which now engulfs much of western and northern China, is spreading by about 1,900 square miles annually; some reports say that despite Beijing's aggressive reforestation efforts, one-quarter of the entire country is now desert. China's State Forestry Administration estimates that desertification has hurt some 400 million Chinese, turning tens of millions of them into environmental refugees, in search of new homes and jobs. Meanwhile, much of China's arable soil is contaminated, raising concerns about food safety. As much as ten percent of China's farmland is believed to be polluted, and every year 12 million tons of grain are contaminated with heavy metals absorbed from the soil.

## WATER HAZARD

And then there is the problem of access to clean water. Although China holds the fourth-largest freshwater resources in the world (after Brazil, Russia, and Canada), skyrocketing demand, overuse, inefficiencies,

pollution, and unequal distribution have produced a situation in which two-thirds of China's approximately 660 cities have less water than they need and 110 of them suffer severe shortages. According to Ma Jun, a leading Chinese water expert, several cities near Beijing and Tianjin, in the northeastern region of the country, could run out of water in five to seven years.

Growing demand is part of the problem, of course, but so is enormous waste. The agricultural sector lays claim to 66 percent of the water China consumes, mostly for irrigation, and manages to waste more than half of that. Chinese industries are highly inefficient: they generally use 10-20 percent more water than do their counterparts in developed countries. Urban China is an especially huge squanderer: it loses up to 20 percent of the water it consumes through leaky pipes -- a problem that China's Ministry of Construction has pledged to address in the next two to three years. As urbanization proceeds and incomes rise, the Chinese, much like people in Europe and the United States, have become larger consumers of water: they take lengthy showers, use washing machines and dishwashers, and purchase second homes with lawns that need to be watered. Water consumption in Chinese cities jumped by 6.6 percent during 2004-5. China's plundering of its ground-water reserves, which has created massive underground tunnels, is causing a corollary problem: some of China's wealthiest cities are sinking -- in the case of Shanghai and Tianjin, by more than six feet during the past decade and a half. In Beijing, subsidence has destroyed factories, buildings, and underground pipelines and is threatening the city's main international airport.

Pollution is also endangering China's water supplies. China's ground water, which provides 70 percent of the country's total drinking water, is under threat from a variety of sources, such as polluted surface water, hazardous waste sites, and pesticides and fertilizers. According to one report by the government-run Xinhua News Agency, the aquifers in 90 percent of Chinese cities are polluted. More than 75 percent of the river water flowing through China's urban areas is considered unsuitable for drinking or fishing, and the Chinese government deems about 30 percent of the river water throughout the country to be unfit for use in agriculture or industry. As a result, nearly 700 million people drink water contaminated with animal and human waste. The World Bank has found that the failure to provide fully two-thirds of the rural population with piped water is a leading cause of death among children under the age of five and is responsible for as much as 11 percent of the cases of gastrointestinal cancer in China.

One of the problems is that although China has plenty of laws and regulations designed to ensure clean water, factory owners and local officials do not enforce them. A 2005 survey of 509 cities revealed that only 23 percent of factories properly treated sewage before disposing of it. According to another report, today one-third of all industrial wastewater in China and two-thirds of household sewage are released untreated. Recent Chinese studies of two of the country's most important sources of water -- the Yangtze and Yellow rivers -- illustrate the growing challenge. The Yangtze River, which stretches all the way from the Tibetan Plateau to Shanghai, receives 40 percent of the country's sewage, 80 percent of it untreated. In 2007, the Chinese government announced that it was delaying, in part because of pollution, the development of a \$60 billion plan to divert the river in order to supply the water-starved cities of Beijing and Tianjin. The Yellow River supplies water to more than 150 million people and 15 percent of China's agricultural land, but two-thirds of its water is considered unsafe to drink and 10 percent of its water is classified as sewage. In early 2007, Chinese officials announced that over one-third of the fish species native to the Yellow River had become extinct due to damming or pollution.

China's leaders are also increasingly concerned about how climate change may exacerbate their domestic environmental situation. In the spring of 2007, Beijing released its first national assessment report on climate change, predicting a 30 percent drop in precipitation in three of China's seven major river regions -- around the Huai, Liao, and Hai rivers -- and a 37 percent decline in the country's wheat, rice, and corn yields in the second half of the century. It also predicted that the Yangtze and Yellow rivers, which derive much of their water from glaciers in Tibet, would overflow as the glaciers melted and then dry up. And both Chinese and international scientists now warn that due to rising sea levels, Shanghai could be submerged by 2050.

#### COLLATERAL DAMAGE

China's environmental problems are already affecting the rest of the world. Japan and South Korea have long suffered from the acid rain produced by China's coal-fired power plants and from the eastbound dust storms that sweep across the Gobi Desert in the spring and dump toxic yellow dust on their land. Researchers in the United States are tracking dust, sulfur, soot, and trace metals as these travel across the Pacific from China. The

U.S. Environmental Protection Agency estimates that on some days, 25 percent of the particulates in the atmosphere in Los Angeles originated in China. {See Footnote 1} Scientists have also traced rising levels of mercury deposits on U.S. soil back to coal-fired power plants and cement factories in China. (When ingested in significant quantities, mercury can cause birth defects and developmental problems.) Reportedly, 25-40 percent of all mercury emissions in the world come from China.

What China dumps into its waters is also polluting the rest of the world. According to the international NGO the World Wildlife Fund, China is now the largest polluter of the Pacific Ocean. As Liu Quangfeng, an adviser to the National People's Congress, put it, "Almost no river that flows into the Bo Hai [a sea along China's northern coast] is clean." China releases about 2.8 billion tons of contaminated water into the Bo Hai annually, and the content of heavy metal in the mud at the bottom of it is now 2,000 times as high as China's own official safety standard. The prawn catch has dropped by 90 percent over the past 15 years. In 2006, in the heavily industrialized southeastern provinces of Guangdong and Fujian, almost 8.3 billion tons of sewage were discharged into the ocean without treatment, a 60 percent increase from 2001. More than 80 percent of the East China Sea, one of the world's largest fisheries, is now rated unsuitable for fishing, up from 53 percent in 2000.

Furthermore, China is already attracting international attention for its rapidly growing contribution to climate change. According to a 2007 report from the Netherlands Environmental Assessment Agency, it has already surpassed the United States as the world's largest contributor of carbon dioxide, a leading greenhouse gas, to the atmosphere. Unless China rethinks its use of various sources of energy and adopts cutting-edge environmentally friendly technologies, warned Fatih Birol, the chief economist of the International Energy Agency, last April, in 25 years China will emit twice as much carbon dioxide as all the countries of the Organization for Economic Cooperation and Development combined.

China's close economic partners in the developing world face additional environmental burdens from China's economic activities. Chinese multinationals, which are exploiting natural resources in Africa, Latin America, and Southeast Asia in order to fuel China's continued economic rise, are devastating these regions' habitats in the process. China's hunger for timber has exploded over the past decade and a half, and particularly since 1998, when devastating floods led Beijing to crack down on domestic logging. China's timber imports more than tripled between 1993 and 2005. According to the World Wildlife Fund, China's demand for timber, paper, and pulp will likely increase by 33 percent between 2005 and 2010.

China is already the largest importer of illegally logged timber in the world: an estimated 50 percent of its timber imports are reportedly illegal. Illegal logging is especially damaging to the environment because it often targets rare old-growth forests, endangers biodiversity, and ignores sustainable forestry practices. In 2006, the government of Cambodia, for example, ignored its own laws and awarded China's Wuzhishan LS Group a 99-year concession that was 20 times as large as the size permitted by Cambodian law. The company's practices, including the spraying of large amounts of herbicides, have prompted repeated protests by local Cambodians. According to the international NGO Global Witness, Chinese companies have destroyed large parts of the forests along the Chinese-Myanmar border and are now moving deeper into Myanmar's forests in their search for timber. In many instances, illicit logging activity takes place with the active support of corrupt local officials. Central government officials in Myanmar and Indonesia, countries where China's loggers are active, have protested such arrangements to Beijing, but relief has been limited. These activities, along with those of Chinese mining and energy companies, raise serious environmental concerns for many local populations in the developing world.

## SPOILING THE PARTY

In the view of China's leaders, however, damage to the environment itself is a secondary problem. Of greater concern to them are its indirect effects: the threat it poses to the continuation of the Chinese economic miracle and to public health, social stability, and the country's international reputation. Taken together, these challenges could undermine the authority of the Communist Party.

China's leaders are worried about the environment's impact on the economy. Several studies conducted both inside and outside China estimate that environmental degradation and pollution cost the Chinese economy between 8 percent and 12 percent of GDP annually. The Chinese media frequently publish the results of studies on the impact of pollution on agriculture, industrial output, or public health: water pollution costs of \$35.8 billion one year, air pollution costs of \$27.5 billion another, and on and on with weather disasters (\$26.5 billion),

acid rain (\$13.3 billion), desertification (\$6 billion), or crop damage from soil pollution (\$2.5 billion). The city of Chongqing, which sits on the banks of the Yangtze River, estimates that dealing with the effects of water pollution on its agriculture and public health costs as much as 4.3 percent of the city's annual gross product. Shanxi Province has watched its coal resources fuel the rest of the country while it pays the price in withered trees, contaminated air and water, and land subsidence. Local authorities there estimate the costs of environmental degradation and pollution at 10.9 percent of the province's annual gross product and have called on Beijing to compensate the province for its "contribution and sacrifice."

China's Ministry of Public Health is also sounding the alarm with increasing urgency. In a survey of 30 cities and 78 counties released in the spring, the ministry blamed worsening air and water pollution for dramatic increases in the incidence of cancer throughout the country: a 19 percent rise in urban areas and a 23 percent rise in rural areas since 2005. One research institute affiliated with SEPA has put the total number of premature deaths in China caused by respiratory diseases related to air pollution at 400,000 a year. But this may be a conservative estimate: according to a joint research project by the World Bank and the Chinese government released this year, the total number of such deaths is 750,000 a year. (Beijing is said not to have wanted to release the latter figure for fear of inciting social unrest.) Less well documented but potentially even more devastating is the health impact of China's polluted water. Today, fully 190 million Chinese are sick from drinking contaminated water. All along China's major rivers, villages report skyrocketing rates of diarrheal diseases, cancer, tumors, leukemia, and stunted growth.

Social unrest over these issues is rising. In the spring of 2006, China's top environmental official, Zhou Shengxian, announced that there had been 51,000 pollution-related protests in 2005, which amounts to almost 1,000 protests each week. Citizen complaints about the environment, expressed on official hotlines and in letters to local officials, are increasing at a rate of 30 percent a year; they will likely top 450,000 in 2007. But few of them are resolved satisfactorily, and so people throughout the country are increasingly taking to the streets. For several months in 2006, for example, the residents of six neighboring villages in Gansu Province held repeated protests against zinc and iron smelters that they believed were poisoning them. Fully half of the 4,000-5,000 villagers exhibited lead-related illnesses, ranging from vitamin D deficiency to neurological problems.

Many pollution-related marches are relatively small and peaceful. But when such demonstrations fail, the protesters sometimes resort to violence. After trying for two years to get redress by petitioning local, provincial, and even central government officials for spoiled crops and poisoned air, in the spring of 2005, 30,000-40,000 villagers from Zhejiang Province swarmed 13 chemical plants, broke windows and overturned buses, attacked government officials, and torched police cars. The government sent in 10,000 members of the People's Armed Police in response. The plants were ordered to close down, and several environmental activists who attempted to monitor the plants' compliance with these orders were later arrested. China's leaders have generally managed to prevent -- if sometimes violently -- discontent over environmental issues from spreading across provincial boundaries or morphing into calls for broader political reform.

In the face of such problems, China's leaders have recently injected a new urgency into their rhetoric concerning the need to protect the country's environment. On paper, this has translated into an aggressive strategy to increase investment in environmental protection, set ambitious targets for the reduction of pollution and energy intensity (the amount of energy used to produce a unit of GDP), and introduce new environmentally friendly technologies. In 2005, Beijing set out a number of impressive targets for its next five-year plan: by 2010, it wants 10 percent of the nation's power to come from renewable energy sources, energy intensity to have been reduced by 20 percent and key pollutants such as sulfur dioxide by 10 percent, water consumption to have decreased by 30 percent, and investment in environmental protection to have increased from 1.3 percent to 1.6 percent of GDP. Premier Wen Jiabao has issued a stern warning to local officials to shut down some of the plants in the most energy-intensive industries -- power generation and aluminum, copper, steel, coke and coal, and cement production -- and to slow the growth of other industries by denying them tax breaks and other production incentives.

These goals are laudable -- even breathtaking in some respects -- but history suggests that only limited optimism is warranted; achieving such targets has proved elusive in the past. In 2001, the Chinese government pledged to cut sulfur dioxide emissions by 10 percent between 2002 and 2005. Instead, emissions rose by 27 percent. Beijing is already encountering difficulties reaching its latest goals: for instance, it has failed to meet its first target for reducing energy intensity and pollution. Despite warnings from Premier Wen, the six industries that

were slated to slow down posted a 20.6 percent increase in output during the first quarter of 2007 -- a 6.6 percent jump from the same period last year. According to one senior executive with the Indian wind-power firm Suzlon Energy, only 37 percent of the wind-power projects the Chinese government approved in 2004 have been built. Perhaps worried that yet another target would fall by the wayside, in early 2007, Beijing revised its announced goal of reducing the country's water consumption by 30 percent by 2010 to just 20 percent.

Even the Olympics are proving to be a challenge. Since Beijing promised in 2001 to hold a "green Olympics" in 2008, the International Olympic Committee has pulled out all the stops. Beijing is now ringed with rows of newly planted trees, hybrid taxis and buses are roaming its streets (some of which are soon to be lined with solar-powered lamps), the most heavily polluting factories have been pushed outside the city limits, and the Olympic dormitories are models of energy efficiency. Yet in key respects, Beijing has failed to deliver. City officials are backtracking from their pledge to provide safe tap water to all of Beijing for the Olympics; they now say that they will provide it only for residents of the Olympic Village. They have announced drastic stopgap measures for the duration of the games, such as banning one million of the city's three million cars from the city's streets and halting production at factories in and around Beijing (some of them are resisting). Whatever progress city authorities have managed over the past six years -- such as increasing the number of days per year that the city's air is deemed to be clean -- is not enough to ensure that the air will be clean for the Olympic Games. Preparing for the Olympics has come to symbolize the intractability of China's environmental challenges and the limits of Beijing's approach to addressing them.

### PROBLEMS WITH THE LOCALS

Clearly, something has got to give. The costs of inaction to China's economy, public health, and international reputation are growing. And perhaps more important, social discontent is rising. The Chinese people have clearly run out of patience with the government's inability or unwillingness to turn the environmental situation around. And the government is well aware of the increasing potential for environmental protest to ignite broader social unrest.

One event this spring particularly alarmed China's leaders. For several days in May in the coastal city of Xiamen, after months of mounting opposition to the planned construction of a \$1.4 billion petrochemical plant nearby, students and professors at Xiamen University, among others, are said to have sent out a million mobile-phone text messages calling on their fellow citizens to take to the streets on June 1. That day, and the following, protesters reportedly numbering between 7,000 and 20,000 marched peacefully through the city, some defying threats of expulsion from school or from the Communist Party. The protest was captured on video and uploaded to YouTube. One video featured a haunting voice-over that linked the Xiamen demonstration to an ongoing environmental crisis near Tai Hu, a lake some 400 miles away (a large bloom of blue-green algae caused by industrial wastewater and sewage dumped in the lake had contaminated the water supply of the city of Wuxi). It also referred to the Tiananmen Square protest of 1989. The Xiamen march, the narrator said, was perhaps "the first genuine parade since Tiananmen."

In response, city authorities did stay the construction of the plant, but they also launched an all-out campaign to discredit the protesters and their videos. Still, more comments about the protest and calls not to forget Tiananmen appeared on various Web sites. Such messages, posted openly and accessible to all Chinese, represent the Chinese leadership's greatest fear, namely, that its failure to protect the environment may someday serve as the catalyst for broad-based demands for political change.

Such public demonstrations are also evidence that China's environmental challenges cannot be met with only impressive targets and more investment. They must be tackled with a fundamental reform of how the country does business and protects the environment. So far, Beijing has structured its environmental protection efforts in much the same way that it has pursued economic growth: by granting local authorities and factory owners wide decision-making power and by actively courting the international community and Chinese NGOs for their expertise while carefully monitoring their activities.

Consider, for example, China's most important environmental authority, SEPA, in Beijing. SEPA has become a wellspring of China's most innovative environmental policies: it has promoted an environmental impact assessment law; a law requiring local officials to release information about environmental disasters, pollution statistics, and the names of known polluters to the public; an experiment to calculate the costs of environmental degradation and pollution to the country's GDP; and an all-out effort to halt over 100 large-scale infrastructure

projects that had proceeded without proper environmental impact assessments. But SEPA operates with barely 300 full-time professional staff in the capital and only a few hundred employees spread throughout the country. (The U.S. Environmental Protection Agency has a staff of almost 9,000 in Washington, D.C., alone.) And authority for enforcing SEPA's mandates rests overwhelmingly with local officials and the local environmental protection officials they oversee. In some cases, this has allowed for exciting experimentation. In the eastern province of Jiangsu, for instance, the World Bank and the Natural Resources Defense Council have launched the Greenwatch program, which grades 12,000 factories according to their compliance with standards for industrial wastewater treatment and discloses both the ratings and the reasons for them. More often, however, China's highly decentralized system has meant limited progress: only seven to ten percent of China's more than 660 cities meet the standards required to receive the designation of National Model Environmental City from SEPA. According to Wang Canfa, one of China's top environmental lawyers, barely ten percent of China's environmental laws and regulations are actually enforced.

One of the problems is that local officials have few incentives to place a priority on environmental protection. Even as Beijing touts the need to protect the environment, Premier Wen has called for quadrupling the Chinese economy by 2020. The price of water is rising in some cities, such as Beijing, but in many others it remains as low as 20 percent of the replacement cost. That ensures that factories and municipalities have little reason to invest in wastewater treatment or other water-conservation efforts. Fines for polluting are so low that factory managers often prefer to pay them rather than adopt costlier pollution-control technologies. One manager of a coal-fired power plant explained to a Chinese reporter in 2005 that he was ignoring a recent edict mandating that all new power plants use desulfurization equipment because the technology cost as much as would 15 years' worth of fines.

Local governments also turn a blind eye to serious pollution problems out of self-interest. Officials sometimes have a direct financial stake in factories or personal relationships with their owners. And the local environmental protection bureaus tasked with guarding against such corruption must report to the local governments, making them easy targets for political pressure. In recent years, the Chinese media have uncovered cases in which local officials have put pressure on the courts, the press, or even hospitals to prevent the wrongdoings of factories from coming to light. (Just this year, in the province of Zhejiang, officials reportedly promised factories with an output of \$1.2 million or more that they would not be subjected to government inspections without the factories' prior approval.)

Moreover, local officials frequently divert environmental protection funds and spend them on unrelated or ancillary endeavors. The Chinese Academy for Environmental Planning, which reports to SEPA, disclosed this year that only half of the 1.3 percent of the country's annual GDP dedicated to environmental protection between 2001 and 2005 had found its way to legitimate projects. According to the study, about 60 percent of the environmental protection funds spent in urban areas during that period went into the creation of, among other things, parks, factory production lines, gas stations, and sewage-treatment plants rather than into waste- or wastewater-treatment facilities.

Many local officials also thwart efforts to hold them accountable for their failure to protect the environment. In 2005, SEPA launched the "Green GDP" campaign, a project designed to calculate the costs of environmental degradation and pollution to local economies and provide a basis for evaluating the performance of local officials both according to their economic stewardship and according to how well they protect the environment. Several provinces balked, however, worried that the numbers would reveal the extent of the damage suffered by the environment. SEPA's partner in the campaign, the National Bureau of Statistics of China, also undermined the effort by announcing that it did not possess the tools to do Green GDP accounting accurately and that in any case it did not believe officials should be evaluated on such a basis. After releasing a partial report in September 2006, the NBS has refused to release this year's findings to the public.

Another problem is that many Chinese companies see little direct value in ratcheting up their environmental protection efforts. The computer manufacturer Lenovo and the appliance manufacturer Haier have received high marks for taking creative environmental measures, and the solar energy company Suntech has become a leading exporter of solar cells. But a recent poll found that only 18 percent of Chinese companies believed that they could thrive economically while doing the right thing environmentally. Another poll of business executives found that an overwhelming proportion of them do not understand the benefits of responsible corporate behavior, such as environmental protection, or consider the requirements too burdensome.

## NOT GOOD ENOUGH

The limitations of the formal authorities tasked with environmental protection in China have led the country's leaders to seek assistance from others outside the bureaucracy. Over the past 15 years or so, China's NGOs, the Chinese media, and the international community have become central actors in the country's bid to rescue its environment. But the Chinese government remains wary of them.

China's homegrown environmental activists and their allies in the media have become the most potent -- and potentially explosive -- force for environmental change in China. From four or five NGOs devoted primarily to environmental education and biodiversity protection in the mid-1990s, the Chinese environmental movement has grown to include thousands of NGOs, run primarily by dynamic Chinese in their 30s and 40s. These groups now routinely expose polluting factories to the central government, sue for the rights of villagers poisoned by contaminated water or air, give seed money to small newer NGOs throughout the country, and go undercover to expose multinationals that ignore international environmental standards. They often protest via letters to the government, campaigns on the Internet, and editorials in Chinese newspapers. The media are an important ally in this fight: they shame polluters, uncover environmental abuse, and highlight environmental protection successes.

Beijing has come to tolerate NGOs and media outlets that play environmental watchdog at the local level, but it remains vigilant in making sure that certain limits are not crossed, and especially that the central government is not directly criticized. The penalties for misjudging these boundaries can be severe. Wu Lihong worked for 16 years to address the pollution in Tai Hu (which recently spawned blue-green algae), gathering evidence that has forced almost 200 factories to close. Although in 2005 Beijing honored Wu as one of the country's top environmentalists, he was beaten by local thugs several times during the course of his investigations, and in 2006 the government of the town of Yixing arrested him on dubious charges of blackmail. And Yu Xiaogang, the 2006 winner of the prestigious Goldman Environmental Prize, honoring grass-roots environmentalists, was forbidden to travel abroad in retaliation for educating villagers about the potential downsides of a proposed dam relocation in Yunnan Province.

The Chinese government's openness to environmental cooperation with the international community is also fraught. Beijing has welcomed bilateral agreements for technology development or financial assistance for demonstration projects, but it is concerned about other endeavors. On the one hand, it lauds international environmental NGOs for their contributions to China's environmental protection efforts. On the other hand, it fears that some of them will become advocates for democratization.

The government also subjects MNCs to an uncertain operating environment. Many corporations have responded to the government's calls that they assume a leading role in the country's environmental protection efforts by deploying top-of-the-line environmental technologies, financing environmental education in Chinese schools, undertaking community-based efforts, and raising operating standards in their industries. Coca-Cola, for example, recently pledged to become a net-zero consumer of water, and Wal-Mart is set to launch a nationwide education and sales initiative to promote the use of energy-efficient compact fluorescent bulbs. Sometimes, MNCs have been rewarded with awards or significant publicity. But in the past two years, Chinese officials (as well as local NGOs) have adopted a much tougher stance toward them, arguing at times that MNCs have turned China into the pollution capital of the world. On issues such as electronic waste, the detractors have a point. But China's attacks, with Internet postings accusing MNCs of practicing "eco-colonialism," have become unjustifiably broad. Such antiforeign sentiment spiked in late 2006, after the release of a pollution map listing more than 3,000 factories that were violating water pollution standards. The 33 among them that supplied MNCs were immediately targeted in the media, while the other few thousand Chinese factories cited somehow escaped the frenzy. A few Chinese officials and activists privately acknowledge that domestic Chinese companies pollute far more than foreign companies, but it seems unlikely that the spotlight will move off MNCs in the near future. For now, it is simply more expedient to let international corporations bear the bulk of the blame.

## FROM RED TO GREEN

Why is China unable to get its environmental house in order? Its top officials want what the United States, Europe, and Japan have: thriving economies with manageable environmental problems. But they are unwilling to pay the political and economic price to get there. Beijing's message to local officials continues to be that economic growth cannot be sacrificed to environmental protection -- that the two objectives must go hand in

hand.

This, however, only works sometimes. Greater energy efficiency can bring economic benefits, and investments to reduce pollution, such as in building wastewater-treatment plants, are expenses that can be balanced against the costs of losing crops to contaminated soil and having a sickly work force. Yet much of the time, charting a new environmental course comes with serious economic costs up front. Growth slows down in some industries or some regions. Some businesses are forced to close down. Developing pollution-treatment and pollution-prevention technologies requires serious investment. In fact, it is because they recognize these costs that local officials in China pursue their short-term economic interests first and for the most part ignore Beijing's directives to change their ways.

This is not an unusual problem. All countries suffer internal tugs of war over how to balance the short-term costs of improving environmental protection with the long-term costs of failing to do so. But China faces an additional burden. Its environmental problems stem as much from China's corrupt and undemocratic political system as from Beijing's continued focus on economic growth. Local officials and business leaders routinely -- and with impunity -- ignore environmental laws and regulations, abscond with environmental protection funds, and silence those who challenge them. Thus, improving the environment in China is not simply a matter of mandating pollution-control technologies; it is also a matter of reforming the country's political culture. Effective environmental protection requires transparent information, official accountability, and an independent legal system. But these features are the building blocks of a political system fundamentally different from that of China today, and so far there is little indication that China's leaders will risk the authority of the Communist Party on charting a new environmental course. Until the party is willing to open the door to such reform, it will not have the wherewithal to meet its ambitious environmental targets and lead a growing economy with manageable environmental problems.

Given this reality, the United States -- and the rest of the world -- will have to get much smarter about how to cooperate with China in order to assist its environmental protection efforts. Above all, the United States must devise a limited and coherent set of priorities. China's needs are vast, but its capacity is poor; therefore, launching one or two significant initiatives over the next five to ten years would do more good than a vast array of uncoordinated projects. These endeavors could focus on discrete issues, such as climate change or the illegal timber trade; institutional changes, such as strengthening the legal system in regard to China's environmental protection efforts; or broad reforms, such as promoting energy efficiency throughout the Chinese economy. Another key to an effective U.S.-Chinese partnership is U.S. leadership. Although U.S. NGOs and U.S.-based MNCs are often at the forefront of environmental policy and technological innovation, the U.S. government itself is not a world leader on key environmental concerns. Unless the United States improves its own policies and practices on, for example, climate change, the illegal timber trade, and energy efficiency, it will have little credibility or leverage to push China.

China, for its part, will undoubtedly continue to place a priority on gaining easy access to financial and technological assistance. Granting this, however, would be the wrong way to go. Joint efforts between the United States and China, such as the recently announced project to capture methane from 15 Chinese coal mines, are important, of course. But the systemic changes needed to set China on a new environmental trajectory necessitate a bottom-up overhaul. One way to start would be to promote energy efficiency in Chinese factories and buildings. Simply bringing these up to world standards would bring vast gains. International and Chinese NGOs, Chinese environmental protection bureaus, and MNCs could audit and rate Chinese factories based on how well their manufacturing processes and building standards met a set of energy-efficiency targets. Their scores (and the factors that determined them) could then be disclosed to the public via the Internet and the print media, and factories with subpar performances could be given the means to improve their practices.

A pilot program in Guangdong Province, which is run under the auspices of the U.S. consulate in Hong Kong, provides just such a mechanism. Factories that apply for energy audits can take out loans from participating banks to pay for efficiency upgrades, with the expectation that they will pay the loans back over time out of the savings they will realize from using fewer materials or conserving energy. Such programs should be encouraged and could be reinforced by requiring, for example, that the U.S.-based MNCs that worked with the participating factories rewarded those that met or exceeded the standards and penalized those that did not (the MNCs could either expand or reduce their orders, for example). NGOs and the media in China could also publicize the names of the factories that refused to cooperate. These initiatives would have the advantages of operating within the

realities of China's environmental protection system, providing both incentives and disincentives to encourage factories to comply; strengthening the role of key actors such as NGOs, the media, and local environmental protection bureaus; and engaging new actors such as Chinese banks. It is likely that as with the Greenwatch program, factory owners and local officials not used to transparency would oppose such efforts, but if they were persuaded that full participation would bring more sales to MNCs and grow local economies, many of them would be more open to public disclosure.

Of course, much of the burden and the opportunity for China to revolutionize the way it reconciles environmental protection and economic development rests with the Chinese government itself. No amount of international assistance can transform China's domestic environment or its contribution to global environmental challenges. Real change will arise only from strong central leadership and the development of a system of incentives that make it easier for local officials and the Chinese people to embrace environmental protection. This will sometimes mean making tough economic choices.

Improvements to energy efficiency, of the type promoted by the program in Guangdong, are reforms of the low-hanging-fruit variety: they promise both economic gains and benefits to the environment. It will be more difficult to implement reforms that are economically costly (such as reforms that raise the costs of manufacturing in order to encourage conservation and recycling and those that impose higher fines against polluters), are likely to be unpopular (such as reforms that hike the price of water), or could undermine the Communist Party's authority (such as reforms that open up the media or give freer rein to civil society). But such measures are also necessary. And their high up-front costs must be weighed against the long-term costs to economic growth, public health, and social stability in which the Chinese government's continued inaction would result. The government must ensure greater accountability among local officials by promoting greater grass-roots oversight, greater transparency via the media or other outlets, and greater independence in the legal system.

China's leaders have shown themselves capable of bold reform in the past. Two and half decades ago, Deng Xiaoping and his supporters launched a set of ambitious reforms despite stiff political resistance and set the current economic miracle in motion. In order to continue on its extraordinary trajectory, China needs leaders with the vision to introduce a new set of economic and political initiatives that will transform the way the country does business. Without such measures, China will not return to global preeminence in the twenty-first century. Instead, it will suffer stagnation or regression -- and all because leaders who recognized the challenge before them were unwilling to do what was necessary to surmount it.

{Footnote 1} The original Associated Press story that was the source for the statement was mistaken and has been corrected. In fact, the EPA, citing a model saying that Asia contributes about 30 percent of the background sulfate particulate matter in the western United States, estimates that Asia contributes about one percent of all particulate matter in Los Angeles.

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