FIFTEEN

Can Red China Become Green China?

I've visited China regularly since 1990, and, looking back, here's what strikes me most: Each time I go there, China's people seem to speak with greater ease and breathe with greater difficulty.

Yes, you can now have strikingly frank talks with officials and journalists in China. But when I walked out of my hotel room heading for an interview the last time I visited Shanghai, in November 2006, the air was so smoky—from the burning of farm fields after the harvest—that for a moment I honestly thought my hotel was on fire. For some three decades now, China's economy has grown at around 10 percent per year, based on low-cost labor and little regard for the waste and pollution it pumped into its rivers and the air. For many years, when you asked about pollution, officials and business leaders in China would say they will clean up when China gets rich enough to afford to clean up. I would argue that now that we are entering the Energy-Climate Era, China can get rich *only if it cleans up*. Unless Red China becomes Green China, the Communist Party leadership will not be able to deliver to all the Chinese people the rising standard of living it has promised.

China cannot afford to do what the West did: Grow now, clean up later. I know that this strikes many Chinese as unfair, which is why global warming is perceived by more than a few Chinese as a "conspiracy" concocted by the West to slow China's growth. It *is* unfair, if you consider how much CO_2 the Western industrialized countries blithely pumped into the atmosphere, long before the Chinese industrial dragon ever started huffing and puffing—and how the West has shipped its dirtiest manufacturing industries to China. But Mother Nature isn't into fair. All

she knows is hard science and raw math: If China were to try to grow now and clean up later, the unprecedented pace and scale of its development would lead to an environmental disaster.

It's all in the numbers: China is one-fifth of humanity; it's now the world's biggest carbon emitter; it is the world's second-largest importer of oil, after the United States; and, according to a report in *The Times* of London (January 28, 2008), it is already the world's largest importer of nickel, copper, aluminum, steel, coal, and iron ore. Timber is certainly up there as well. It is not an exaggeration to say: As goes China, so goes planet earth. If China can make a stable transition to clean power and an energy-and-resource-efficient economy, we as a planet have a chance to mitigate climate change, energy poverty, petrodictatorship, and biodiversity loss in significant ways. If China can't, China's emissions and appetites will nullify everything everyone else does to save the earth, and the Energy-Climate Era will careen toward the unmanageable. So for me, the crucial question of this book is actually two questions: "Can America really lead a real green revolution?" and "Can China really follow?" Everything else is just commentary . . .

To put it in the local vernacular, Deng Xiaoping once famously said of China's economy: "Black cat, white cat, all that matters is that it catches mice"—that is, forget about Communist ideology, all that matters is that China grows. Not anymore. Now, if that cat isn't green, neither it nor the mice, nor any of the rest of us, are going to make it.

So how's China doing? The best short answer I've heard comes from the longtime Asia-watcher Nayan Chanda, the former editor of the *Far Eastern Economic Review* and now editor of *YaleGlobal Online*. When I asked Chanda for his views on China's energy and environment performance, he answered with barely a pause: "Go rent the movie *Speed*."

That 1994 thriller stars Keanu Reeves, Dennis Hopper, and Sandra Bullock. Reeves plays Jack Traven, an LAPD SWAT team specialist who is sent to defuse a bomb that Howard Payne, a revenge-driven extortionist (Dennis Hopper), has planted on a bus. But here's the rub: The bomb has been rigged to explode the second the speed of the bus falls below 50 miles per hour. So Jack and Annie Porter, a passenger played by Sandra Bullock, must keep the bus hurtling through the streets of Los Angeles at more than 50 miles per hour—or they, the bomb, and everything around them will go up in flames.

"China is that bus," said Chanda.

"It has to grow at a minimum of 8 percent a year or it will explode," he added, "because it will have so much unemployment and discontent, the population will erupt." The implicit ruling bargain that the Chinese Communist Party has offered the people of China has been very clear ever since the end of Mao's era. It goes like this: "We are replacing Communism with GDPism. GDPism says: We get to rule. You, the people, get to become prosperous. You accept our rule. We guarantee your rising prosperity." Without a steadily rising Gross Domestic Product—without that China bus going 50 miles per hour—that ruling bargain would unravel.

But my own regular visits to China over the past two decades have taught me that while this remains the ruling bargain, China's leaders, who are very shrewd, have come to understand that in a world that is becoming hot, flat, and crowded, China cannot sustain this ruling bargain any longer—without adding a footnote in fine print. And the fine print now says: "This ruling bargain is subject to limitations that China will soon have to impose on itself—because the environmental, energy, and biodiversity implications of China's largely coal-powered growth will, if unrestrained, end up killing Chinese, irredeemably polluting China's environment, sapping its economy, and alienating the rest of the world. If the rest of the world, particularly the United States, moves in the next few years to some form of carbon tax, or if Mother Nature imposes even harsher punishments in her own way, China will have to move away from cheap and dirty fuels; otherwise it will face a boycott of its goods. Therefore, the Communist Party reserves the right to slow down growth in the name of cleaning up the economy."

China's leaders may not have spelled out that footnote to themselves or their people in so many words, but it is the logic driving where they need to go and have already started moving. That is why, when you add it all up, there is no avoiding the conclusion that China's leadership is engaged in one of the most daring political high-wire acts ever attempted on the world stage. As Chanda put it: "China's leaders are trying to replace the motor in that Chinese bus from a gas-guzzling polluter to a superefficient hybrid—but they're trying to do it while the bus is still going 50 miles an hour."

This could be the greatest show on earth.

The drama unfolding in China is so compelling because the same Communist Party that three decades ago replaced Communism with GDPism is now trying to replace GDPism with "Green GDPism." And

what's most fascinating about this show is how the Chinese leadership has decided, after a lot of trial and error, to go about it. The bus driver has turned around, told the passengers that the engine needs to be changed—without specifying exactly how it's to be done—and even started allowing some of the passengers to jump into the engine well and tinker. China's leaders have come to understand that they can't change this engine alone.

At first, as mounting pollution became an issue in the 1990s, China's leaders tried to engineer Green GDPism the same way they did the Cultural Revolution and the Great Leap Forward: by just ordering it from the top down. But that didn't work. Plain old GDPism—growth at any price—had too much momentum. So now they are trying a more top-down-plus-bottom-up approach that involves allowing the Chinese press to spotlight environmental polluters, passing progressive energy efficiency laws, encouraging investments in clean power research and technology, and granting China's civil society some of the legal tools to bring violators to trial. I would not describe it as a system yet; it is often one step forward and two steps back. And sometimes the same local leader or businessman acts like a pure GDPist in the morning and as a Green GDPist in the afternoon. In real life, especially in societies in transition, people often have multiple identities. But *it is happening*, and it appears to be China's strategy for switching from dirty capitalism to *relatively* clean capitalism without having to slow down the bus too much.

"We tend to think in grand systematic ways, but in fact, if you look back, China's leadership moved from a Communist centrally planned system to a capitalist market society without having a grand plan," said Edward S. Steinfeld, a China specialist at MIT and the author of *Forging Reform in China: The Fate of State-Owned Industry*. "It was done in an incremental, nonsystematic way, and the same thing seems to be happening with environmentalism. Some in the leadership are recognizing the dire costs of growth. They are not flipping a switch to turn it off, but they are empowering forces in society and the media to do something about it. It produces this kind of whirlpool of competing claims and impulses, but it is moving in a certain direction."

This strategy raises several fundamental questions, and they are the focus of this chapter. What exactly got China's leaders to move from GDPism to Green GDPism? Are they moving fast enough? What role can the United States play in supporting China's Green Leap Forward?

And, maybe most important, by granting more power to the Chinese people so they can protect their *freedom to breathe*, will China's Communist Party leadership unleash political forces that, over time, will give the Chinese people much more *freedom to speak*? Could this turn out to be the first big democracy movement that starts as an environmental movement?

"Could a movement that begins with people being empowered to pursue their right to breathe, their right to drink clean water, and their right to see the stars in the sky at night," asks Chanda, "end with people securing their right to speak, because you cannot do one without the other?" Could a battle "over the right to inhale," added Chanda, "end with more rights to exhale?"

Most China experts would tell you the answer is no, but when you look at the scope and scale of what China is going to need to do to wrestle its pollution problems to the ground, you see that it could end up requiring and stimulating more political change than anyone now realizes.

What got the Chinese leadership to move toward Green GDPism? Probably nothing more than looking out the window. It's not like they could miss the problem, even riding in a limousine with tinted glass. An American friend in Beijing tells me that every morning he gets up and does his own air quality test—as many Beijing residents do: He looks out his twenty-fourth-story window and checks how far he can see. On a rare pristine day, when the wind has swept Beijing clean, he can see the Fragrant Mountain rising to the northwest. On a "good" pollution day, he can see the China World building four blocks away. On a bad day, he can't see the building next door. Those are the days when Beijing is enveloped by a film of pollution from exhaust given off by the thousand new cars a day, on top of the three million existing cars, that hit the road there, mixed with emissions from coal-burning power plants and factories, as well as dust from construction sites, from off the deserts, and from cement plants running full out. (It's almost too much to have asked, but China should have learned from America's mistake, skipped cars altogether, and gone directly to the world's best mass transit system, because to fuel all these vehicles for a burgeoning Chinese middle class is going to be an endless economic drain and an environmental nightmare.)

The problem of conventional pollution reached a degree of critical-

ity in recent years that not only made it inescapable but made future trend lines terrifying for the Chinese leadership, if they took no action. As the deputy minister of China's State Environmental Protection Agency, Pan Yue, said in a famously candid interview with *Der Spiegel* (March 7, 2005):

> Many factors are coming together here: Our raw materials are scarce, we don't have enough land, and our population is constantly growing. Currently, there are 1.3 billion people living in China, that's twice as many as 50 years ago. In 2020, there will be 1.5 billion people in China. Cities are growing but desert areas are expanding at the same time; habitable and usable land has been halved over the past 50 years . . . The environment can no longer keep pace. Acid rain is falling on one third of the Chinese territory, half of the water in our seven largest rivers is completely useless, while one fourth of our citizens does not have access to clean drinking water. One third of the urban population is breathing polluted air, and less than 20 percent of the trash in cities is treated and processed in an environmentally sustainable manner. Finally, five of the ten most polluted cities worldwide are in China . . . Because air and water are polluted, we are losing between 8 and 15 percent of our gross domestic product. And that doesn't include the costs for health. Then there's the human suffering: In Beijing alone, 70 to 80 percent of all deadly cancer cases are related to the environment. Lung cancer has emerged as the No. 1 cause of death.

No, those are not problems any government could ignore—let alone the rest of us. The U.S. Environmental Protection Agency reports that on some days almost 25 percent of the polluting matter in the air above Los Angeles originated in China.

One of the most famous pictures to ever come out of China was Chairman Mao swimming in the Yangtze River. But as Andreas Lorenz observed in a *Der Spiegel* essay (November 28, 2005) on the toxic pollution that has now poisoned so many of China's rivers and lakes: "Nowadays . . . chairman Mao Zedong's legendary swimming outing in the Yangtze River in 1966 would no longer be seen as evidence of his strength, but more as a suicide attempt."

Beyond this general trend toward environmental degradation, China's leadership was clearly alarmed by a sudden surge in energy use in recent years. As the team of experts who follow China's environment at the Lawrence Berkeley National Laboratory explained to me, between 1980 and 2000 China's GDP quadrupled, but its total energy usage only doubled—a sign of good energy and resource efficiency and tight government controls.

Post-2001, however, the new government in Beijing loosened monetary policy, and China's entry into the World Trade Organization dramatically increased foreign investment in the country, particularly for manufacturing, and this turbocharged China's exports. In the process, China fell off the wagon in terms of energy efficiency, alarming the leadership. Between 2001 and 2005, growth in energy usage in China outpaced growth of its GDP—in 2005 it was 40 percent faster—as the Chinese at once embarked on a massive and energy-intensive buildup of its nationwide physical infrastructure, took on the dirty industries being shed by the West, and just began to live more comfortably, in bigger apartments with air-conditioning, TVs, and computers.

Finally, China's leadership began to act because of climate change. In just the past two years, China's leaders, like many others around the world, have come to realize that climate change is not only real but appears to be changing China's own climate in potentially disastrous ways much faster than anyone had anticipated. "China's average temperature in 2007 was 10.3 degrees centigrade [50.5 degrees Fahrenheit], which made 2007 the warmest year since the establishment of a national climate-observation network in 1951," the *Beijing Review* reported (January 4, 2008). "This record-high temperature, which marked the 11th year in a row that the national average temperature has been higher than in a normal year, was remarkably higher than the second highest figure of 9.9 degrees centigrade [50 degrees Fahrenheit] in 2006."

In December 2006, China's government issued its first official report on climate change. It noted that glaciers in the nation's northwest had decreased by 21 percent since the 1950s, and that all of China's major rivers had shrunk over the past five decades. "Global climate change has an impact on the nation's ability to develop further," said the Ministry of Science and Technology, one of twelve government departments that prepared the report.

Lu Xuedu, deputy director of the Global Environmental Affairs Of-

fice of the Ministry of Science and Technology, told China's Xinhua News Agency (October 4, 2007) that "climate change has begun to take its toll in China in recent years, and we shouldn't wait till it is too late to take action." In China's National Climate Change Program (June 4, 2007), the government pledged to restructure the economy, promote clean energy technologies, and improve energy efficiency. China is the world's biggest producer and consumer of coal, using coal-fired power to meet 80 percent of its vast energy needs; it adds roughly 1 gigawatt of coal-fired power every two weeks.

Lu told Xinhua that if climate change remains unchecked, the yield of China's major crops (including wheat, rice, and corn) will drop by up to 37 percent in the second half of this century. "Global warming will also reduce the river levels, and lead to more droughts and floods. And water supply in western China will fall short of demand by up to 20 billion cubic meters from 2010 to 2030," he said. Climate change also presents a major threat to ecologically vulnerable areas such as the Qinghai-Tibet Plateau, which is the water tower of China, the Xinhua report noted. Less water in the rivers is not only bad for farmers, but will also significantly decrease hydro power, which will make China even more dependent on coal than it is now.

But recognizing the problem and its urgency is only half the battle for China's leadership. Getting the whole system to respond—from cities to provinces to the central government, and from the public sector to the private sector—is another matter.

In September 2007, I visited Beijing in the middle of an Indian summer. Every time I went to interview a Chinese official in his office, I found myself loosening my tie and exclaiming: "Hey, is it a little warm in here, or is it just me?"

No, I was told, it wasn't just me. In June 2007, China's State Council had ordered—in the way only China could—that all government agencies, associations, companies, and private owners in public buildings must set their air-conditioning thermostats no lower than 26 degrees Celsius, or 79 degrees Fahrenheit. Air-conditioning consumes one-third of the electricity demand in China in summer. And you could definitely feel the difference in public offices.

A few days later, I was reading some reports from China's English-

language newspapers and I came across an item from the *Shanghai Daily*. It said the municipality had sent out teams to see who was complying with the government's air-conditioning edict, and they found that "more than half of the city's public buildings have failed to obey power-saving rules setting air-conditioning at 26 degrees Celsius, according to local energy authorities."

That in a nutshell is the good news, the bad news, and the interesting news from China today. The good news is that the government has decided to step in and take over people's thermostats in public buildings. That is an indication of seriousness. The bad news is that in the provinces and cities outside Beijing, and even inside Beijing, local officials are not afraid to ignore the State Council's environmental edicts. As the old Chinese saying goes: "The sky is high and the emperor is far away."

But the interesting news is that someone ordered the *Shanghai Daily*, a state-run newspaper, to expose those city buildings and officials who were ignoring the air-conditioning order—something I'm not sure would have happened five years ago. (And the really, really interesting news is that maybe nobody ordered the *Shanghai Daily* to write this story. Instead, maybe entrepreneurial journalists, sensing a relevant space in which they could report like real journalists and effect social change, and have political cover to boot, went out and did the reporting on their own. That's the new China.)

In many ways, it is these three trends that are fighting it out in China today: a leadership that understands the problem and is taking serious measures, a system that is so big and diffuse and has so much momentum for growth that slowing it down is extremely difficult (even for an authoritarian government), and the first tentative steps to enlist civil society and media in China on the side of environmentalism. It is not clear which trend is going to win.

Certainly, China's initial effort to green its GDP from the top down has met with enormous resistance from the capitalist system unleashed in the early 1970s, as ad hoc coalitions of local government and business officials who benefited from cowboy capitalism eluded whatever edicts came down from Beijing—sometimes in cahoots with high officials there.

China is "a veritable unstoppable growth machine," wrote the China experts Elizabeth C. Economy and Kenneth Lieberthal in their *Harvard Business Review* essay (June 2007) on China's environmental problems, "Scorched Earth: Will Environmental Risks in China Overwhelm the

Opportunities?" The fact that the Communist Party's legitimacy depended on maintaining economic growth, they noted, meant that any environmental regulations that got in the way of growth tended to be ignored or watered down one way or the other.

China's political system is built on five layers: national, provincial, municipal, county, and township, explained Economy and Lieberthal—with the Communist Party sitting atop all five. For officials who are trying to move up the system, "success is rewarded in two ways," they noted. "Formally, annual performance evaluations are pegged primarily to GDP growth in each jurisdiction. Informally, local officials personally benefit financially from that growth by investing in or holding positions in key firms, by assigning relatives to management positions, by engaging in plain vanilla corruption, and so on." This system has unleashed so many official entrepreneurs, said Economy and Lieberthal, that if the Chinese Communist Party were aptly named, it would really be called the "China Bureaucratic Capitalist Party." Party leaders at all levels, they added, "are entrepreneurial tigers hell-bent on using political power directly, in league with local public and private enterprises, to spur rapid GDP growth in their own bailiwicks."

The whole system enabled "local officials to protect their enterprises from meaningful implementation of environmental laws and regulations," added Economy and Lieberthal. "Indeed, officials often require that enterprises in their jurisdictions ignore such laws and regulations in their quest for ongoing GDP growth. Then, in an effort to offset any fines the companies may have to pay for environmental transgressions, officials cover up the resulting problems in their reports to higher levels, interfere in local courts to prevent adverse rulings, and bestow tax breaks, bank loans, and other financial support on affected enterprises."

It was for all these reasons that Beijing's Green GDP initiative in 2005 and 2006—which promised to judge Chinese officials on how well they protected their environment and deduct points for environmental degradation from their GDP growth numbers—never had any impact. It was difficult to calculate and measure uniformly, and local officials resisted implementing such a green yardstick. So the initiative died an early death. So too did some early goals. China's tenth Five-Year Plan, which began in 2001, called for a 10 percent reduction in sulfur dioxide in China's air—and when that plan concluded in 2005, sulfur dioxide pollution in China had *increased* by 27 percent.

What China's leaders apparently realized from that tenth Five-Year Plan—their first serious foray into green policy—was that taking China from Communism to capitalism was actually easier than trying to take it from dirty capitalism to clean capitalism. Because going from Communism to state-directed capitalism, while by no means easy, involved taking the lid off a people who were yearning to be entrepreneurial, wildcatting capitalists. It involved unleashing something long suppressed in the Chinese culture—and the results of all that unleashed energy are apparent everywhere.

But going from Dirty GDPism to Green GDPism is about restraining and redirecting all that natural energy—and to do that effectively requires a system with some judicial independence, so that courts can discipline government-owned factories and power plants. It requires a freer press that can report on polluters without restraint, even if they are government-owned businesses. It requires more transparent laws and regulations, so citizen-activists know their rights and can feel free to confront polluters, no matter how powerful. And most of all, it requires growth based on sustainable energy productivity—not growth based on dirty energy productivity.

Although China's leadership underestimated how hard it would be to change the engine on their bus from a dirty combustion engine going at full throttle to a hybrid, here's what's interesting: They have not backed off. There were more than a few signs in 2007 and 2008 that they've actually decided to double their green bets—and that is going to make the early-twenty-first century politically very interesting in China.

It is almost as if a light went on in the Chinese politburo. The leadership realized that if it did not tackle this environment-energy-climate problem, dirty air, as much as slower growth, would undermine the stability and legitimacy of the Communist Party. Therefore, finding a way to grow green was becoming an imperative, not an option. It was a survival strategy. In that sense, China's leadership is becoming like those of many other governments around the world in the Energy-Climate Era—shifting the basis of its legitimacy from the ability to defend China's borders, which is now taken as a given, to the ability to deliver a higher living standard and to protect the nation from environmental degradation and energy and climate disruptions.

So what we've started seeing with the eleventh Five-Year Plan—2006 to 2010—is Beijing pushing with one hand even more extensive green laws from the top and, with the other hand, opening things up a little to enable more change from the bottom: fitfully giving more power to its citizens and newspapers to expose environmental crimes and to bring pressure to bear on those local officials and factories that want to continue exploiting the old, cheap-coal-based system. And, with a third hand, the Chinese leadership is pushing the bureaucracy and the private sector to pursue the enormous economic opportunities inherent in clean power and energy efficiency, telling them in effect: "To get green is glorious."

China's eleventh Five-Year Plan includes a goal of reducing energy intensity—energy consumption per unit of GDP—by 20 percent below 2005 levels across the whole economy by 2010. It's estimated that this would result in about 1.5 billion tons of avoided CO_2 emissions. That target is five times as ambitious as the commitment announced by the European nations under the Kyoto Protocol. China's National Development and Reform Commission, which oversees all these energy programs, has spread out the target reductions among provinces and industrial sectors. And this time the leadership expressly made meeting these goals part of every government official's personnel assessment. This gives it teeth. Individuals are now accountable for meeting key energy efficiency and environment goals. In 2006 and 2007, however, China fell short of the annual 4 percent goal in energy efficiency that it needs to reach the 20 percent improvement by 2010. Until I see a major governor, or industry manager, sacked for realizing his or her GDP goals but failing to meet their green targets, I will remain skeptical. But it is, at least on paper, a much more serious approach than any China has ever had.

Unfortunately, the challenge China's leaders face today is much more serious as well. The sheer scale and scope of urbanization is staggering: By 2020 the urban population is expected to increase from 42 to 60 percent, equivalent to tens of millions of new urban residents and hundreds of new satellite cities, notes Jiang Lin, senior vice president of the China Sustainable Energy Program, in his May 2008 report. "Accompanying urban population growth has been skyrocketing demand for the energy-intensive materials of which new buildings, roads, power plants, and factories are built." This is, he added, "the largest migration in human history."

To give the government more muscle, in March 2008 China's politburo also elevated the status of the State Environmental Protection Agency, a famously toothless watchdog agency, into a full-fledged Cabinet ministry, with more staff and a bigger budget.

"China has adopted several world-class policies in just the past two years, and they are working on more. In a couple of areas they are now actually leading the United States," notes David Moskovitz, director and cofounder of the Regulatory Assistance Project, a U.S. nonprofit research group that works on conservation issues in many countries, including China.

On January 1, 2006, China instituted a national renewable energy mandate—of the sort the U.S. Congress rejected in 2007—that requires China's provincial governments to develop and adopt renewable energy for their localities. China's target is to increase renewable energy—particularly wind, hydro, and biomass—to 16 percent of its total energy production by 2020. Today it is 7 percent. China also adopted world-class mileage standards for its cars.

In October 2007, Moskovitz pointed out, China also imposed a new rule on power plants, which said that instead of burning the cheapest fuel first, such as coal, they had to use the cleanest fuel first—natural gas, solar, or wind, if it is available. "It drives demand for cleaner fuels and on a day-to-day basis has had an immediate effect on emissions," said Moskovitz. "If we adopted it [in America], it would make a huge difference." In an effort to weed out polluting and energy-intensive industries, China has also instituted a differential pricing system, whereby state power companies now charge higher electricity prices to the least efficient industrial concerns and lower prices to the more efficient ones, in an effort to reward the most efficient producers and force the least efficient to either change or shut down.

"So the most efficient steel mill wins in two ways, by having lower energy use and lower energy prices, and the least efficient loses in two ways—having higher energy use and prices and therefore higher production costs," said Moskovitz. "We can't get our power companies to even think about doing that." China is now in the midst of a program of shutting down its most inefficient small power plants, totaling around 50 gigawatts (or 8 percent of China's total generating capacity), by 2010. Most important, while every American energy bill is just the sum of all lobbies, with very little long-term strategic thinking, in 2006 China began draft-

ing a comprehensive national energy law that will provide a long-term strategy for the whole country, and the leadership has been circulating it to experts for comments to get it right rather than just promulgating it from on high.

The proof will be in the breathing. China still has a long, long way to go to even get close to America's environmental profile, considering that its energy consumption is growing at about 15 percent a year, while in America consumption is growing at 1 or 2 percent. "They are not efficient," said Moskovitz, "but they are becoming more efficient quickly, because with their growth they are bringing in a lot of new plants, so their average efficiency level is improving."

The more China's leadership pushes to make green growth real, the more it is staking its credibility on this goal. Therefore, one has to wonder whether the leadership can afford *not* to empower China's civil society and unleash it as a green watchdog that can buttress these new regulations being passed from the top, so they actually get implemented this time. China's citizens are the leadership's only ally against the bureaucratic and private sector Dirty GDPists. This is the dynamic I am tracking most closely.

Green movements historically have started as grassroots movements in democratic societies. They start from the bottom up, usually as a society achieves a certain level of economic growth and develops a large and secure middle class that cares about these issues. Many countries, including China and America, have wonderful environmental laws on the books, but without civil society groups to monitor compliance and bring lawsuits against local governments or companies that try to skirt the rules or violate them outright, those laws will always be vulnerable.

I got a tutorial on this subject right after returning from China in September 2007 at the Sierra Club's annual meeting in San Francisco, where I was being given a journalism award. It was one of two dozen awards that the Sierra Club presented that night, and the longer I sat through the awards ceremony, the more I thought about China. Almost every award the Sierra Club handed out that evening went to local citizens or small Sierra Club chapters or legislators who had, on their own, used America's courts or regulatory bodies to expose or halt some egregious attack on the environment.

What struck me as I watched these activists come up to accept their scrolls was how *ordinary* they were, in the very best sense of that word. They were just ordinary citizens who cared deeply about the environment and had exercised their rights of free speech, assembly, and petition to take on huge companies or local governments—and won!

Here's just a sample: Congressman Mike Thompson, who represented California's first congressional district, won the Sierra Club's Edgar Wayburn Award for helping to pass national legislation in 2006 that guaranteed protection for 431 square miles of wilderness in Northern California. A Special Achievement Award went to the Illinois chapter of the Sierra Club for leading a statewide campaign to approve new regulations on mercury pollution. The Walter A. Starr Award went to Ted Snyder of Walhalla, South Carolina, for spending more than thirty-five years fighting a proposed thirty-seven-mile road through the Smoky Mountains National Park that would have sliced through the largest roadless tract of mountain land in the east. The William O. Douglas Award went to Richard Duncan of Minneapolis, for his handling of critical pieces of litigation in the Sierra Club's fight to protect the Boundary Waters.

I am convinced that China's leaders are slowly realizing that they have to create a similar model, now that they have staked their own reputations on a greener economy. They will never say so, but I do not think they can go green without, over time, going at least a little orange—à la the Orange Revolution in Ukraine in 2004—and loosening the reins on civil society.

Tim Shriver, chairman of Special Olympics, once said to me something about how China deals with people with disabilities that also applies to how it will have to deal with the environment. "My question is whether or not China has any understanding of the one phenomenon that many consider the most unique and politically significant American contribution to social and political life: the engaged citizen," said Shriver. "It is our least noticed export and yet is also, in my humble opinion, our most valuable one. Engaged citizens help each other, organize around issues they believe in, and hold officials accountable for actions whenever they can. They are the economic engine of a free press . . . So the question raised by globalization and the increasing economic and political integration of China isn't just about the extent to which bigtime bosses will allow political dissent, or the extent to which they can

fight internal corruption, or the extent to which they can manage the yuan. It is also [about] the extent to which they understand and allow one of the key precursors to all of these: citizens organizing themselves. The best enforcers are engaged citizens. The only reason a social change law gets enforced, in the end, is because citizens become engaged in making the change themselves. The state alone can't do it. And the common ground of all these movements trying to effect social change agendas is that they depend on citizens actually caring—otherwise the state passes a law, puts it on the books, and everyone just goes home."

There are certainly signs in the media from China that "ordinary citizens" there wanted to be empowered, and indeed are demanding to be empowered, on the environmental front—while the state cannot quite make up its mind. But the more Chinese citizens obtain the tools of the flat world—cell phones, the Internet, PDAs, and so on—the more their voices can and will be heard. Here is just a sample of the environmental stories I came across from China in the months while I was finishing this book, which illustrate what is percolating there:

> Residents took to the streets of a provincial capital over the weekend to protest a multibillion-dollar petrochemical plant backed by China's leading state-run oil company, in the latest instance of popular discontent over an environmental threat in a major city. The protest, against a $5.5 billion ethylene plant under construction by PetroChina in Chengdu, the capital of Sichuan Province, reflected a surge in environmental awareness by urban, middle-class Chinese determined to protect their health and the value of their property. A similar protest last year, against a Taiwanese-financed petrochemical venture in Xiamen, in China's southeast, left that project in limbo. The recent protest, which was peaceful, was organized through Web sites, blogs and cellphone text messages, illustrating how some Chinese are using digital technology to start civic movements, which are usually banned by the police. Organizers also used text messages to publicize their cause nationally. The protesters walked calmly through downtown Chengdu for several hours on Sunday afternoon to criticize the building of a combined ethylene plant and oil refinery in Pengzhou, 18 miles northwest of the city center. Some protesters wore white masks over their mouths to evoke the dangers of pollution. About 400 to 500 protesters took part in the march, witnesses said. Organizers circumvented a national law that requires protesters to apply for a permit by saying they were only out for a "stroll." [*The New York Times*, May 6, 2008]

> Polluters along two of China's main rivers have defied a decade-old clean-up effort, leaving much of the water unfit to touch, let alone drink, and a risk to a sixth of the population, state media said on Monday. Half the check points along the Huai River and its tributaries in central and eastern China showed pollution of "Grade 5" or worse—the top of the dial in key toxins, meaning that the water was unfit for human contact and may not be fit even for irrigation, national legislators were told. Years of crackdowns and waste treatment investment have reined in some of the worst damage to the Huai and Liao Rivers, but industrial pollution remained far too high, Mao Rubai, chairman of the National People's Congress environment and resources protection committee, said in a report delivered on Sunday. The rivers posed a "threat to the water safety of one sixth of the country's 1.3 billion population," the *China Daily* said. [Reuters, August 27, 2007]

> China has ordered provincial governments to replace 50 million traditional incandescent lamps with heavily-subsidized energy-efficient lights this year. This is part of a campaign launched by the Ministry of Finance and the NDRC in January with the goal to use 150 million energy-efficient light bulbs over the next 5 years. Several provinces received specific targets of 2 or 3 million bulbs, including a 2-million bulb target for Beijing. China produced at least 80% of the world's energy-efficient light bulbs, with 2.4 billion bulbs made in 2006, compared with only 200 million in 1997. China would save 60 billion kilowatt hours of power each year, or 22 million tons of coal equivalent each year, if all its incandescent lamps were replaced with CFLs, reducing emission of carbon dioxide by 60 million tons. [Xinhua News Agency, May 14, 2008]

> In the past 15 years, more than 80,000 journalists have taken part in the All-China Environmental Protection Century Tour, one of China's largest nationwide environmental protection campaigns.

> Since 1993, more than 200,000 news reports have been filed to raise the public's awareness about energy and the environment. Their reports have helped overhaul China's polluting mining industry and also initiated investigations to protect the Yellow and Yangtze Rivers. The theme of the campaign changes every year; for 2007, it focused on reducing energy consumption and pollutant emissions. "A public opinion survey released in Beijing found that 60.7 percent of respondents were concerned about food safety. It also found that 66.9 percent of respondents felt that environmental problems were very serious in China. However, despite rising concern over pollution, 49.7 percent of people believed their involvement in environmental-protection campaigns made no difference." [Xinhua News Agency, January 8, 2008]

"Sustainability issues are inducing what I believe are extraordinary sociopolitical changes in China today," said MIT's Ed Steinfeld. "While many of us, including myself, tend to view these changes in purely oppositional terms—citizen versus state—the changes are obviously more complicated, involving emerging civic groups, blurring of the boundaries between state and civic actors, growing political consciousness among citizens, and growing policy activism by political entrepreneurs within the state. Kevin O'Brien and Liangjiang Li, writing primarily on rural anti-tax protests, get at this sort of political change in their book, *Rightful Resistance in Rural China*. They really hit that dynamic of the policy entrepreneurs in the central state pushing a variety of citizen-focused weapons—legal measures, state media reports on targeted issues like taxation or pollution—[and] citizens then picking up those weapons and running with them by protesting against wayward local officials, all in the name of legitimate central policies and laws, and then local officials hitting back. Plus, you have elite activists—younger technocrats at the central level, leading academics, leading journalists—all of whom are tied to the state and party, the establishment in effect—often getting into the act by pushing the passage of progressive laws or even directly encouraging protest at the local level."

People at the grass roots witness this, see the new laws passed, get information from establishment media outlets, often get direct encouragement from some of those establishment activists, and then go out and do things themselves—like bring a lawsuit against the local government the

next time it tries to build a chemical plant, added Steinfeld. "Sometimes the citizens win, sometimes they don't. More tragically, sometimes they end up getting beaten up by local thugs or thrown in jail. The point isn't that the system is just, but rather that this dynamic of 'rightful' or 'legitimate' protest has been unleashed . . . There are many reasons to dislike what goes on in China. But it is a mistake to believe that this system is stuck in the past, incapable of change, or willing to change only on its own terms. I'm actually optimistic."

And now there is a new factor: the emergence of a clean-tech industry in China, which has an acute economic interest in promoting greener laws and regulations so that it can sell more of its products around China, build its strength and cut its costs using China's big domestic market, and then leverage all that to grow globally. China's leadership is aggressively pushing clean tech because it is a way to make GDP and Green GDP compatible. As China looks for technology fixes to its own pollution problems, it wants to create an export industry.

One need only sit down with a mayor like Xia Deren, the longtime mayor of Dalian, to understand how big a push China is making into clean tech. Mayor Xia is renowned for having taken great care to both preserve and expand the parks in his coastal city of six million people—my favorite city in China—knowing that, as the nation's software capital, it has to attract knowledge workers, and such workers are highly mobile and prefer healthy cities.

When I interviewed him in September 2007, the first thing Mayor Xia said to me was: "The biggest challenge we have is how to balance economic growth with the energy needs and environment . . . We are increasingly aware that resources in both China and the world are limited. For example, Dalian is scarce in fresh water, so we have to develop water-saving industries. And second, Dalian is scarce in coal, and that means we have to develop a lot of energy-saving industries . . . If we want to achieve the balance between the environment and energy and growth, we have to develop those industries that are energy saving and environmentally friendly, like software . . . Currently in China there is a concept of the recycling economy—to reuse everything. However, we know that it is really difficult to translate this concept into practice in a short period of time, so we have to do it in a step-by-step way. But, anyway, we have to

move forward and start now. We have a strict policy on environmental protection and energy consumption. For example, we don't have such plants as steel-making here, because it adds pollution to the air and is highly energy consuming. We have also relocated more than a hundred industries to the industrial park, where there will be centralized pollution treatment. In the last year, we closed thirty-one large cement plants because of their pollution. And this year we plan to close nineteen small-sized cement plants . . . We are constantly focused first on the percentage of energy consumption per unit of GDP and second on reducing pollution and waste."

He then went on to explain that Dalian's massive new convention center was using a cutting-edge clean-tech heat pump technology, which recovers thermal energy from seawater and then uses that thermal energy to cool and heat the building in a totally renewable way. "We can save 30 percent on our energy costs," he remarked proudly.

When I asked the mayor how he was managing his time these days, he said: "In terms of my economic work, about one-fourth to one-third of my time is now devoted to cutting emissions and cutting energy usage. I think of myself as developing an energy-efficient city . . . We set our environmental standards to those of developed countries. We have set our auto-emission standards to European levels and our air quality can reach the standard of European countries."

Dalian, he added, had just won the national competition to host China's top energy research laboratory. I have interviewed Mayor Xia several times since 2000. I'd never had a conversation with him like this before.

And I also never had an interview quite like the one I had with Shi Zhengrong—who, when I sat down with him in 2006, was ranked as the seventh-richest man in China by *Forbes* magazine. His fortune then: $2.2 billion. Guess what Shi does. Real estate? No. Banking? No. Manufacturing for Wal-Mart? No. Construction? No. Shi is China's leading maker of silicon photovoltaic solar cells, which convert sunlight into electricity.

Yes, one of China's richest men today is a green entrepreneur! It should only happen in America. Shi thinks that clean power is going to be the growth industry of the twenty-first century, and he wants to make sure that China and his company, Suntech Power Holdings, are the industry leaders. Only forty-five years old and full of energy himself, Shi

told me he would like to do for solar energy what China did for tennis shoes: drive down the cost, so that millions of people who cannot afford solar photovoltaic panels will be able to do so. I visited him at his office in Shanghai, which gave us both a laugh because we were atop a skyscraper and could barely see through the pollution haze that day, *while talking about solar power.*

Shi founded Suntech in Wuxi, China, near Shanghai, after earning a Ph.D. in engineering in Australia in 1992. As *The Wall Street Journal* put it in a profile, Suntech combines "first world technology and developing world prices"—so effectively that it has become one of the world's top four solar manufacturers, along with Sharp and Kyocera of Japan and BP of England. The key to his business, Shi explained to me, is that he uses low-cost Chinese labor, rather than high-tech machines, to make his solar modules and handle the fragile silicon, and he takes advantage of the subsidies offered by different Chinese provinces, whose officials are eager for him to open a Suntech factory in their region. Roughly 90 percent of his business today is abroad, he explained. But as he brings the price of his solar cells down, the China market is opening up. Shi expects to use that combination of price and market size to gain greater scale and drive the price of his cells down further, giving him a real cost advantage with which to attack his global competitors.

"If we have a market here, we feel confident we will be a cost leader," he says. Thanks to Suntech's success, "now there is a rush of [Chinese] businesspeople entering this sector, even though we still don't have a market here," said Shi. "Many government people now say, 'This is an industry!'"

And it is not the only renewable one. China's wind energy industry is also experiencing dramatic growth: Installed wind capacity grew by nearly 100 percent between 2005 and 2007. China achieved its 2010 wind development target of 5,000 megawatts by the end of 2007. At this pace, in five years, China will become a major player in global wind generation and manufacturing.

Just when you think the Chinese could never possibly replace that dirty diesel engine in their bus with a clean plug-in hybrid while keeping the bus moving at 50 miles per hour, you get an e-mail like the one I got from Jon Wellinghoff, a member of the U.S. Federal Energy Regulatory Commission, after he returned from China in April 2008: "The most interesting thing of the entire trip was discovering that in the course of less

than ten years they have literally turned over their entire stock of two-stroke scooters and mopeds into all-electric vehicles. There are now forty million electric scooters and bicycles in China. I was blown away. And they all take their little batteries upstairs at night to charge up and bring them back down in the morning and plug them back into their scooters and off they go. So electrification of the transportation sector is possible and being done in China today. And even going to coal-based electrification of transportation lowers CO_2 as well as dramatically lowering urban pollution. The two days I was in Beijing there were actually blue skies."

Bottom line: When it comes to clean energy technologies, "China is just beginning to move from copying to creating," said Rob Watson, the energy consultant. "The last time they were in full creative mode they invented paper, the compass, and gunpowder."

For all these reasons, the Green China story is definitely a work in progress that bears careful scrutiny. There are so many trends and countertrends, hopeful signs and signs of an environmental apocalypse, that I certainly wouldn't predict how it will all play out. Of all the indices I will be watching closely, the one I believe will be most decisive in determining whether Red China becomes Green China is how the Chinese deal with their new buildings challenge. As I noted above, China is expected to erect hundreds of new cities and smaller towns in the next twenty years. It will have to build new homes and offices for over 300 million people who will be moving from the countryside to urban areas, and it will have to build homes for another 250 million people it wants to keep living in villages, and not move to the cities. The world has never seen such a building project before, and much of China's future is riding on how it proceeds. If China's leaders do it the "American way," with big energy-consuming structures, it will give birth to a giant pig that will eventually eat China out of house and home—out of coal, oil, and gas—in the coming decades. Remember, buildings generally account for roughly 40 percent of national energy consumption, and once they start eating energy and water, they don't stop for thirty or forty years. If, instead of following America's already outdated practices, the Chinese decide to leapfrog us and go straight to "net-zero" buildings—buildings with passive lighting, solar exteriors, or wind turbines that can generate their own energy during the day and take from the grid only at night so that they are

net-zero energy consumers—they have a chance to avoid the worst crisis. But today's Chinese leaders need to be as serious about this as their predecessors were about the one-child policy. Just as the one-child policy has probably saved China from a population calamity, net-zero buildings might save China—and therefore the rest of us as well—from an energy and environmental calamity.

Getting this right is going to be a real challenge for China's Communist Party leadership, as will be figuring out how much to unleash China's civil society to help expose, reduce, and monitor pollution, as will be determining how quickly and how much to slow down growth in dirty areas while trying to stimulate it in clean areas, and how to do all of them in a way that maintains social stability and continues to narrow income gaps. Precisely because doing all those things together is so hard and the stakes are so high, China's leadership may be tempted to be tentative—to sit on the fence at times, to settle for less, to fiddle with numbers. But China can't afford that. The world can't afford that.

In short, China is purposively trying to become something different tomorrow from what it is today, and we have to do all we can to ensure that the "New China" has a green face. Because that is not a sure thing, America has a decisive role to play. It can help tip China in the right direction, but only if we go first. Leadership is not about "after you." It's about "follow me." We are the ones who put into the atmosphere the lion's share of the CO_2 that is slowly warming the world. We are the ones with the resources that should enable us to take the lead in inventing a clean power system. The greatest thing that America could do today for itself, China, and the world is become an example of a country that grows prosperous, secure, innovative, and respected by becoming the greenest, most energy-efficient, and most energy productive country there is.

I would even take it a step further and say that the greatest thing that the United States could do today for itself, for China, and the world is to publicly state its intention to "outgreen China"—to let the Chinese know every day in every way that we are going to try to clean their clock in the next great global industry: clean power. Just as we and the Soviets had a space race, a competition to see who could put a man on the moon first—a competition that greatly strengthened our own society, from education to infrastructure—we, the European Union, and the Chinese need to have a similar race today. Only instead of a race to put a man on the moon, it has to be a race to preserve humankind on earth. In the

Cold War there was a winner and a loser, but in the earth race either we will all win or we will all lose, because if China's speeding bus was to explode—economically or environmentally—it would be a disaster for everyone.

If America decisively embarked on building a Clean Energy System and the technologies to drive it, China would have no choice but to move decisively in the same direction. Because staying dirty would not just mean that a billion and a half Chinese will continue to breathe dirty air. It would mean that China lags behind in the next great global industry. But we cannot even begin to suggest that the Chinese do the hard work of greening their society until we do some hard work ourselves. (It is truly galling to the Chinese that we've raided Mother Nature's buffet and that now, when they're getting to the leftovers, we're accusing them of gluttony.) "The most frequent and difficult question we get in China with every policy initiative we put forward," said David Moskovitz, "is this: 'If it is so good, why aren't you doing it?' It's hard to answer—and somewhat embarrassing. So we point to good examples that some American states, or cities, or companies are implementing—but not to the federal government. We can't point to America."

China's collective "societal raison d'être has been utterly tied up with a process of linking China to a global system and getting China onto a 'global track,'" said MIT's Ed Steinfeld. "If advanced industrial societies 'go green,' China isn't somehow going to see this as an opportunity to break the rules and undercut us all on pricing. Just the opposite—it's going to feel intense pressure societally and politically to go green as well. Political legitimacy and national identity in China are deeply tied up with the mission of modernizing China. Modernity, for better or worse, is represented by us. That's in part why, even at great cost, China ultimately pushed for WTO accession. It's also, in part, why the state establishment in China is interested in pushing certain attributes of modern democracy—rule of law, civil society, accountability, limited elections—even as it resists any hint of a multiparty system . . . If we build it, they will come—just as they have done consistently, if fitfully and unexpectedly, in every other case of global institutional change over the past twenty years."

We are still the city on the hill for many Chinese, even though they hate what we've done at times at the top of the hill. When we live dirty, it is justification for them to live dirty. And when we live big, they want

to live big—big houses, big skyscrapers, big cars. "And if we live a sustainability story," added Steinfeld, "that will get translated into China as a benchmark of modernity and what being world-class is all about."

If America assumes leadership on the clean power issue, and China feels impelled to follow, this cannot help but encourage China's leadership to empower more of its citizens and media to speak out on environmental excesses and to act as watchdogs on local governments and businesses. Therefore, the more and the faster we, America, inspire, shame, provoke, induce, and lead China down a greener path, the sooner we not only will make the world a cleaner place but will help strengthen the rule of law in China and its civil society groups. It won't happen overnight, and I am not suggesting that it alone will lead China to become a multiparty democracy anytime soon. But I am saying that the Chinese Communist Party will not be able to deliver on its promise to its people of the freedom to breathe unless it gradually but steadily starts to grant more of them the freedom to speak.

PART V

America