

Chinese Innovations in Environmental Regulatory Policy

Prepared for
Jeffrey Smoller,
Multi-State Working Group on Environmental
Performance

April Nozomi Goodwin
Ben Jones
Kavan Kucko
Marianna Smirnova
Carrie Traud



**Robert M. La Follette School of Public Affairs
University of Wisconsin-Madison**

© 2008 Board of Regents of the University of Wisconsin System
All Rights Reserved.

For additional copies:
Publications Office
La Follette School of Public Affairs
1225 Observatory Drive, Madison, WI 53706
www.lafollette.wisc.edu/publications/workshops.html
publications@lafollette.wisc.edu

The La Follette School of Public Affairs is a nonpartisan teaching and research department of the University of Wisconsin–Madison. The school takes no stand on policy issues; opinions expressed in these pages reflect the views of the authors.

Table of Contents

List of Tables.....	iv
Foreword.....	v
Acknowledgments.....	vi
Executive Summary.....	vii
Introduction.....	1
1. Context.....	2
2. China’s Innovative Green Market Initiatives.....	4
2.1. Green Credit.....	4
2.2. Green IPOs.....	5
2.3. Green Export Licenses.....	6
2.4. Green Insurance.....	7
3. Environmental Regulations.....	8
3.1. Command and Control.....	8
3.2. Market Incentives.....	9
3.3. Evaluation.....	10
4. Advantages over Traditional Regulation.....	11
4.1. Proportionality.....	11
4.2. Enforceability.....	12
4.3. Advantages of the Blacklist.....	13
4.4. Synergies with Existing Regulation.....	14
5. Potential Pitfalls.....	15
5.1. Lack of Incentives to Go beyond Mandates.....	15
5.2. Unwilling Partnerships.....	15
5.3. Concerns with Blacklists.....	16
5.4. Perverse Incentives.....	17
5.5. Loopholes for Multinational Corporations.....	17
6. Potential Improvements.....	19
6.1. Motivating Innovation beyond Benchmarks.....	19
6.2. Addressing Administration Issues.....	20
6.3. Closing Loopholes for Multinational Corporations.....	21
6.4. Limiting Opportunities for Corruption.....	21
Recommendations.....	23
Works Cited.....	24

List of Tables

Table 1. Proportionality and Enforcement of Environmental Policy Options.....	13
Table 2. Advantages and Disadvantages of Environmental Blacklists	17
Table 3. Improvements on Green Market Policies	22

Foreword

Students in the Master of International Public Affairs (MIPA) program in the Robert M. La Follette School of Public Affairs at the University of Wisconsin–Madison produced this report for the Multi-State Working Group on Environmental Performance (MSWG), represented for this project by Jeffrey Smoller, President of the MSWG and Special Assistant to the Secretary for the Wisconsin Department of Natural Resources. The students are enrolled in the Public Affairs Workshop, International Issues, the capstone course in their graduate program. The workshop provides MIPA students the opportunity to improve their analytical skills by applying them to an issue with a substantial international component and to contribute useful knowledge and recommendations to their client.

The La Follette School offers a two-year graduate program leading to a Master of Public Affairs or a Master of International Public Affairs degree. In both programs, students develop analytic tools with which to assess policy responses to issues, evaluate implications of policies for efficiency and equity, and interpret and present data relevant to policy considerations.

The workshop provides practical experience applying the tools of analysis acquired over three semesters of prior coursework to actual problems clients face in the public, non-governmental, and private sectors. Students work in teams to produce carefully crafted policy reports that meet high professional standards. The reports are research-based, analytical, evaluative, and (where relevant) prescriptive responses to real-world clients. This culminating experience is the ideal equivalent of the thesis for the La Follette School degrees in public affairs. While the acquisition of a set of analytical skills is important, it is no substitute for learning by doing.

I am grateful to Wilbur R. Voigt whose generous gift to the La Follette School supports the workshop projects. With his donation, we are able to finance the production of the final reports, plus other expenses associated with the projects.

The opinions and judgments presented in the report do not represent the views, official or unofficial, of the La Follette School or of the client for which the report was prepared.

Melanie Frances Manion
Professor of Public Affairs and Political Science
May 12, 2008

Acknowledgments

We would like to thank Professor Melanie Manion for outstanding commitment to our research and work; Karen Faster for her editorial wizardry; Susan Yackee for her insight and expertise; and Jeffrey Smoller of the Multi-State Working Group on Environmental Performance for the opportunity to investigate these policies.

Executive Summary

China's economy, the fastest-growing in the world, has increased at an annual rate of nearly 10 percent since 1983. Severe harm to the environment has accompanied much of this growth. Recently, however, rhetoric in China has shifted away from economic growth at all costs toward a balance between expanding the economy and environmental sustainability. In 2007, China introduced the "green market initiatives," regulations aimed at increasing incentives for firms to reduce pollution. To our knowledge, this report represents the first attempt to critically analyze these regulations. As of April 2008, some policies have yet to reach even the pilot stage. As the regulations mature, more information will become available, which may offer policymakers further lessons.

The new initiatives attempt to leverage aspects of the market in which firms operate in the pursuit of environmental protection. The "green credit" policy will limit, and in some cases eliminate, access to loans from commercial banks for polluting firms. Firms will be required to submit environmental records and plans before filing for an initial public stock offering under the "green IPO" policy. Firms will also undergo environmental litmus tests if they want to operate under the "green export" policy. "Green insurance" requires firms likely to cause environmental catastrophe to purchase supplemental insurance to pay for cleanups and reparations for victims.

All of these innovative environmental policies have some important advantages over traditional regulation. Unlike fines, these policies affect offending firms relatively equally regardless of their size. These policies may prove easier to enforce than traditional methods because the state takes rights away from firms as opposed to forcing them to pay fines. In addition, these policies offer the advantage of a simple blacklist that informs the general public about the worst polluters. One more advantage is that these policies all require cooperation with powerful economic agencies, increasing the power of the enforcement mechanism.

These policies have some disadvantages as well, some of which are unique to their innovative nature, and others that they share with existing environmental regulations. As with some traditional policies, China's new green policies provide incentives to meet standards but lack incentive to innovate beyond the benchmark. Though requiring multiple agencies to coordinate their efforts may increase the clout of the policies, it also adds complexity. These policies go a long way to reprimand firms, but multinational corporations may escape punishment because they can evade capital controls by accessing capital in other countries.

Overall, we find these policies an innovative source from which policymakers around the globe can model environmental regulation. Our proposed alterations to the way China plans to implement these policies would maximize their effectiveness. Where applicable, multiple targets as opposed to single static benchmarks could provide incentive for firms to continue to abate pollution past the benchmark. Requiring firms to apply for benefits associated with increased compliance shifts the burden of proof to the firms and may reduce administrative costs to the state. Restricting access to imported manufacturing inputs may extend the reach of the green market initiatives to firms unaffected by export limitations.

In sum, the policies we suggest would be best implemented as complements to current regulations as opposed to replacing them. Policymakers can use these measures as an alternative method to punish those who continue to pollute and as further incentive to change environmentally damaging behaviors.

Introduction

Faced with severe environmental problems, China has developed new regulations that restrict access to credit, the stock market, and export licenses and require insurance for major polluting firms. As a shift away from traditional command-and-control policies, these new initiatives leverage the market to punish polluters and promote environmental responsibility. To our knowledge, this report represents the first attempt to analytically evaluate these policies. Due to lack of transparency in China and the early stages of policy implementation, the specifics remain vague and even contradictory. Despite these limitations, the available information offers enough detail to provide salient lessons to policymakers worldwide. As the policies move out of the pilot stage, we anticipate more detailed information will become available, offering policymakers insights impossible to foresee at this time.

In section 1, we discuss the historical background and put China's new green initiatives in the context of contemporary Chinese regulation. Section 2 provides a detailed description of each policy, and section 3 addresses what China intends to accomplish. In section 4 we define the two traditional fields of environmental policy: command-and-control regulation and market-based mechanisms. Section 5 addresses advantages China's new initiatives might hold over existing regulation. In section 6 we suggest potential problems that the new policies may encounter, and in section 7 we discuss indirect consequences—positive and negative—of implementation. Finally, in section 8 we propose specific changes to be considered in light of the shortcomings.

1. Context

Policy innovation often springs from policy failure. China's environment, for centuries under pressure from the country's large population, has deteriorated greatly in the past fifty years. The Maoist era brought mass campaigns, such as the "backyard steel furnaces" and the "four pests" campaigns (part of the Great Leap Forward, 1958–60), that killed millions of birds, deforested huge swaths of land, and wasted many of China's natural resources (Siciliano, 2006). Since the market reforms of the 1980s, the situation has actually worsened: rivers and skies have blackened, the western deserts have expanded east, and the East China Sea has developed one of the largest dead zones in the world (Chen, Gong, Shiah, 2007). Much of this devastation can be attributed to regulatory failure. The series of environmental disasters that ravaged the country in the past decade, in particular the tragedy of the Huai River, which chemical pollutants turned black several times in the late 1990s, has made environmental protection a greater priority for the Chinese Communist Party (Economy, 2004).

Since the "economic reform and opening" championed by Communist Party leader Deng Xiaoping beginning in the early 1980s, China's economy expanded at an average rate approaching 10 percent, more than twice the global growth rate over the same period (World Bank, 2007a). With this immense growth has come severe environmental degradation. Today China accounts for 20 of the 30 most polluted cities in the world (World Bank, 2007b) and will likely become the world's largest emitter of greenhouse gases by 2010 (Kahn and Yardley, 2007). The Chinese population suffers between 460,000 and 1.4 million premature deaths annually as a direct result of air and water pollution according to World Bank and Chinese State Environmental Protection Administration reports (Coonan, 2007). Air pollution alone costs China 1.2 to 3.8 percent of annual gross domestic product (GDP) (World Bank, 2007a). Many of these problems have been linked to industrial pollution, making regulation of industry a primary concern for Chinese environmental policymakers (BBC News, 2007).

Under the socialist economy of Chairman Mao Zedong (1949–76), China required little regulatory bureaucracy because private business did not exist. From the early years of Deng's reforms through the late 1990s, the Chinese Communist Party viewed environmental regulation as a hindrance to economic growth, discouraging any serious efforts to construct an effective environmental regulatory bureaucracy. In 1996, President Jiang Zemin officially criticized this position, proclaiming environmental protection a key policy, equal in importance to population planning, to ensure successful long-term development of the country (Ross, 1998). A decade later, the government's

eleventh Five-Year Plan for development acknowledged for the first time the importance of environmental protection by elevating it to the same level as economic growth (Ren, 2007). Despite this official change and the passage of more than one hundred environmental laws and regulations, the Chinese government has failed to slow the torrent of pollution that threatens to choke off future development (Diamond and Liu, 2008). Most of the regulations have proven ineffective, in part by failing to provide sufficient incentive structures for environmental stewardship. For example, the current maximum fine for polluting is 100,000 yuan (13,500 U.S. dollars), far less than the cost of upgrading a facility with pollution control devices (Xinhua News Agency, 2007b). In spite of official rhetoric favoring environmental protection, the system used to evaluate government officials still encourages growth above all: regional leaders must meet large economic growth targets to obtain promotions and other career rewards (The Economist, 2005).

Since the turn of the century, China's rapidly deteriorating environmental situation has forced the development of experimental regulatory mechanisms, producing innovation in environmental policy. In 2004, President Hu Jintao introduced a "green GDP" program that recalculated economic growth by incorporating environmental factors. He intended for green GDP to become the new evaluation criterion for local officials, but China never fully implemented the program due to opposition from provincial government leaders and the National Statistical Bureau (Jiang, 2007). Despite this failure, China continues to make innovations in environmental policy. Unlike green GDP, China's latest response, the basket of green market initiatives, seeks to alter incentives for firms, rather than for government officials.

2. China's Innovative Green Market Initiatives

In 2007, China's State Environmental Protection Administration (SEPA) began implementing its basket of green market initiatives aimed at punishing businesses that engage in environmentally unsound practices (Ma, 2007). China's new policies do not use traditional punishments; instead they attempt to leverage market forces to penalize industrial polluters and encourage better environmental practices. Denying access to credit, the stock market, and export licenses, along with requiring pollution insurance, are four of the ways in which SEPA has recently sought to intertwine the market with environmental policy. Pan Yue, deputy head of SEPA, insists these initiatives will curb the expansion of the economic sectors responsible for much of China's pollution, while reducing capital-market risk. He expects the initiatives will pressure firms to behave more responsibly toward the environment (International Herald Tribune, 2008).

China's green market initiatives deny aspects of the free market as an incentive for them to take environmental concerns into account. When firms violate China's environmental regulations, SEPA adds them to a "blacklist" that is published and distributed to financial authorities (South Morning China Post, 2007, and China Daily, 2007a). The firms are then subjected to financial punishments and exclusions until they bring themselves into compliance with regulations. Business loans have been denied to blacklisted firms in accordance with the "green credit" initiative. "Green IPOs," "green insurance," and limitations on export licenses ("green export licenses") are additional tools in the basket of green market initiatives intended to discourage destructive environmental behavior by harnessing the powers of the market. China's limited governance capacity may eventually undermine the implementation of the initiatives, but, regardless of whether they succeed in China, these innovations may offer valuable lessons to policymakers around the world.

2.1. Green Credit

To grow and maintain their business, firms require periodic capital inputs beyond that which their operating revenues can provide. The primary source of these supplemental funds is bank loans. The People's Bank of China operates both as a commercial bank by making loans to firms and citizens and as the national reserve bank by holding the funds of all state-owned banks and enterprises in China (Encyclopedia Britannica, 2008). Because of the People's Bank of China's domination of China's banking system, the Chinese government has the capability to leverage access to bank loans for policy goals.

The first initiative introduced, green credit, requires firms seeking bank loans to meet a number of environmental standards before receiving funding from banks. Moreover, SEPA can request that banks withdraw or recall loans from the more egregious polluters. SEPA provides information on firms' environmental performance and violations to the People's Bank of China and the China Banking Regulatory Commission, and a determination is made as to whether polluting firms continue to receive loans or are blacklisted from receiving credit (Bezlova, 2007). The partnership with the Commission and the People's Bank, along with the cooperation of commercial banks and financial institutions, expands SEPA's power by placing the enforcement mechanism for the green credit initiative in the hands of more powerful ministries.

SEPA has applied the green credit policy on several occasions since its inception. In July 2007, SEPA denied loans to twelve of the thirty large firms on the government's blacklist for environmentally irresponsible behavior. Despite this apparent initial success, banks have still allocated nearly \$200 billion in new loans to offending firms, calling into question the long-term prospects of the policy (International Herald Tribune, 2007).

2.2. Green IPOs

An initial public offering (IPO) occurs when a private firm sells shares of stock on a publicly traded stock exchange for the first time. The capital accrued from these sales goes directly to the firm—as opposed to secondary sales on the open market where multiple investors exchange stock and money. The firm has no obligation to pay these funds back; instead, the individual who purchases the stock has a claim to a portion of the future profits of the firm. IPOs can generate large amounts of capital without firms incurring debt. Typically, a firm reinvests the capital from an IPO to fund expansions. In addition to IPOs, firms can issue secondary offerings to the public to amass more capital.

SEPA, along with the China Securities Regulatory Commission, is implementing the green IPO initiative, which leverages firms' reliance on generating capital through IPOs in China for the enforcement of environmental standards. Announced in November 2007, the green IPO initiative began as a pilot program to inspect one hundred listed firms from eleven sectors most likely to pollute. SEPA replaced provincial-level authorities in evaluating potential IPOs based on environmental standards (Ng and Ren, 2007). Polluting firms now must undergo environmental inspections prior to obtaining authorization for IPOs. The Securities Regulatory Commission has responsi-

bility for approving plans for expansion, while SEPA reviews emissions data and energy efficiency levels. If the firm is in compliance, then the Commission grants permission to proceed with the offering (The Standard, 2008). If SEPA finds the firm does not meet its standards, the Securities Regulatory Commission denies the offering until the firm complies. Recently, SEPA inspected and penalized ten enterprises for not complying with the environmental commitments they made prior to listing (The Standard, 2008). SEPA's grounds for punishment are ad hoc, but the agency expects to release universal standards sometime in 2008 (Ng and Ren, 2007). Standards will likely include compliance with emission limits as well as a minimum energy efficiency requirement. Following implementation, firms will have to meet SEPA standards prior to receiving permission for an IPO. They also must stay in compliance or face further punitive action (China Daily, 2007b). By restricting IPO and secondary offering rights based upon environmental standards, China sends a message to firms: to gain full access to capital in China's rapidly growing economy, firms must play by SEPA's rules. To date, SEPA has not released details regarding the implementation or success of the pilot program.

2.3. Green Export Licenses

Exports, comprised primarily of manufactured goods (92.4 percent in 2006), have driven China's recent economic development. Exports generated more than 968 billion U.S. dollars for the Chinese economy in 2006 (World Trade Organization, n.d.). Manufactured exports contribute substantially to the severe pollution problem, threatening future development (Money Week, 2007). The green export initiative seeks to remedy this by ensuring exported goods adhere to environmental standards.

A joint effort between SEPA and the Ministry of Commerce, the green export initiative began in October 2007. The initiative denies polluting firms the right to export for up to three years. SEPA and its regional offices monitor environmental performance by exporting firms and report their findings to the Ministry of Commerce. The Ministry evaluates the information and determines whether to revoke, deny, or approve export licenses (Chou, 2007). In addition to licenses, other export-related applications can be denied as well, including "quotas...contracts for processing, and applications for participating in national or regional trade fairs" (Xinhua News Agency, 2007a). The final decision on license denial rests with the MOC, giving it significant discretionary authority (Chou, 2007).

China requires export licenses for all domestic and multinational exporters. Article 6 of the Implementation Measures of the Ministry of Foreign Economic Relations and Trade Concerning the Application for Import and Export states that: "Export licenses shall be applied for and obtained once every six months for any product produced and to be exported by an Enterprise with Foreign Investment" (Novexcn, n.d.). Toys tainted by lead paint and produced in China were exported to the United States in 2007, causing an international scandal. The incident led to the Chinese government suspending export licenses of more than 700 toymakers (Barboza, 2007). While no licenses have been revoked for environmental reasons to date, the precedent is encouraging.

2.4. Green Insurance

Firms and individuals purchase insurance to protect themselves against potential damages resulting from unforeseen events. When a firm's actions lead to environmental disaster, the firm often lacks the resources to clean up the mess. China bases the green insurance initiative upon the concept of risk-pooling to ensure that a sufficient amount of capital will be available to clean up industrial environmental catastrophes. High-polluting firms will be forced to pay higher rates, so this policy should have a deterrent effect and lead to reduced numbers of environmental accidents and higher compensation for victims. SEPA, in partnership with the China Insurance Regulatory Commission, unveiled its plans in February 2008 to implement the green insurance system. Set for nationwide implementation in 2015, it is undergoing a trial period focused on firms involved in the production, storage, transport, and sale of chemical products that run a high risk of causing substantially polluting accidents. China will pay particular attention to firms that have caused serious pollution (Hernandez, 2008).

According to SEPA, more than 80 percent of the more than 7,500 large chemical projects in China are located near rivers or densely populated regions, exposing sensitive areas to substantial risk (China Environmental News, 2008). One hundred eight incidents of pollution were reported in 2007. Prior to the implementation of the green insurance system, offending firms would declare bankruptcy to avoid paying cleanup costs and related expenses, forcing the government to clean up the mess and compensate victims seeking financial reparations (Red Orbit, n.d.). Green insurance requirements should end this practice, while also reducing the frequency of environmental crises.

3. Environmental Regulations

One of the goals of government agencies (such as SEPA) tasked with protecting the environment is to correct market failures created by firms undervaluing the environmental impacts of their operations. Markets exist and function because a set of institutional rules frames them. Actors on either side of a transaction have to trust that, after the transaction is completed, the collective authority (the government) will enforce the implicit contract created during the exchange. Without this trust, markets fail to function. In this sense, regulation does not interfere with a market; rather it restructures the rules with the objective of making the market better meet societal goals. To do this, policymakers provide incentives to firms for good stewardship and disincentives to firms for environmentally degrading behavior. Regulations, especially environmental regulations, can largely be separated into two types: command-and-control policies and market-based policies.

3.1. Command and Control

Typically, governments use their power to create and enforce policies that require industry and local governments to meet environmental targets, for example, limiting the sulfur dioxide and mercury emissions from coal-fired power plants or requiring environmental impact statements for major construction projects. Failure of a firm to heed these command-and-control policies results in penalties such as fines, official reprimands, or the withholding of government subsidies.

Command-and-control policies work well in countries with strong central authorities where the threat of enforcement is credible. They also work better when regulators set clear, easy-to-evaluate standards that all firms must follow, reducing confusion and the risk of special treatment. The United States has made great strides with policies such as the Clean Air Act and the Clean Water Act, whose standards for air- and water-borne pollutants have resulted in numerous fines and in a cleaner environment.

Though often successful in meeting their goals, command-and-control policies also generally suffer from high monitoring costs. In countries such as the United States, residents can lodge complaints against polluting industries, but often the government alone has the capacity to monitor firms' compliance with regulations. Effective monitoring requires significant resources that many environmental agencies do not have. Command-and-control policies also do little to promote innovation. Due to the policies' static benchmarks, firms have little incentive to adopt strategies that exceed those standards.

3.2. Market Incentives

Market incentives, such as emissions trading or carbon taxes, have received far more interest in policy circles lately, particularly concerning solutions to climate change. With market-based initiatives, the state sets either a nationwide limit on the quantity of a pollutant that can be released and then distributes saleable pollution permits to firms or sets a price on the pollutant (usually in the form of a tax) and lets firms choose their abatement strategy—in theory, minimizing the costs of regulation.

3.2.1. Cap and Trade

When policymakers decide they wish to explicitly control the quantity of a pollutant on an aggregate level, an emissions trading scheme is often used. When constructing an emissions trading regulation, policymakers decide upon a nationwide (or worldwide) cap, or target for pollution reduction. The regulating body then creates a limited number of credits that allow the right to emit a portion of the capped aggregate emission goal. The rights to emit the regulated pollutant are then divided among the firms that produce it. Common ways of distributing credits include grandfathering (i.e., giving credits to firms at no cost) and auction. After allocation, firms can sell—or trade—the credits on an open market. As the firms seek maximum profits and are forced to consider pollution abatement as a cost of the production process, the firms will sell credits to one another until the marginal cost of abatement equals the price of the pollution credit. This behavior minimizes the costs of the mandate to individual firms, thus reducing the aggregate cost of the mandate.

One drawback to cap and trade is that the setting the socially optimal quantity of allowable pollution can be difficult. In addition, cap and trade does not prevent pollutants from being highly concentrated in a single locale. Because cap-and-trade policies only limit the aggregate amount of emissions in a nation (or the world), they cannot prevent a firm from maintaining its level of emissions and buying up credits. This is not a problem with a pollutant such as carbon dioxide, which has little to no effect on the environment nearest the source. For other pollutants, such as mercury, that disperse less widely and have significant environmental and health consequences in high concentrations, a universal, command-and-control standard across firms might be a better approach than cap and trade to ensure no specific area becomes over-polluted.

3.2.2. Pigovian Tax

Pollution taxes internalize the environmental costs of pollution in goods and services. Used in a few European countries, such as Sweden, they remain controversial: like most taxes, they raise the cost of consumer goods (The Local, 2007). However, proponents stress that they are less administratively costly than cap-and-trade systems and that even in the case of a carbon tax (which affects virtually all goods) the price increases could be offset by a reduction in income taxes, thereby shifting taxes from earnings to consumption (Elperin and Mufson, 2007).

3.3. Evaluation

Neither command-and-control nor market-based initiatives are unambiguously better. Market-based initiatives allow firms to minimize costs associated with a regulation. Also, cap-and-trade may lower administrative costs by providing firms with an incentive to report their competitors for violating environmental standards. Command-and-control regulation sets a universal standard ensuring that pollutants are less geographically concentrated: under a cap and trade, one company might choose to buy many permits and not decrease its pollution, leading to greater relative pollution nearby. Which policy meets its goals and best serves society is highly dependent upon the situation.

The Chinese basket of green market initiatives provides examples of innovative quasi-market-based regulation. These new policies are not pure market-based solutions in the sense that they do not operate through price-based mechanisms: the criterion for punishment appears to be equal across firms. In this way, the policies resemble command-and-control regulation. However, the penalties for infringement are market related. Typical command-and-control policy would apply a fine for failure to follow a mandate. The Chinese solution instead restricts the area of the market in which the offending firm can operate, giving these policies a market flavor. By using access to aspects of the market as a lever to enforce compliance with command-and-control limits, the green market initiatives may in certain situations serve the interests of society more effectively than could purely market-based or purely command-and-control policies.

4. Advantages over Traditional Regulation

The green market initiatives—credit, IPOs, export licenses, and insurance—may have several advantages over more traditional environmental policies in the right context. First, by restricting polluting firms’ access to capital, rather than using fines or taxes tied to the amount of pollution, the green market initiatives may offer stricter punishment for large firms. Second, by denying access to capital rather than collecting money from firms, these policies may prove easier to enforce. Finally, use of a blacklist gives agencies flexibility in enforcement and offers a simple way for consumers to identify “dirty” firms.

4.1. Proportionality

The size of fines in traditional command-and-control regulation is generally determined by the type and degree of damage a firm causes. This means that for a particular offense the magnitude of the fine is consistent across firm sizes: a large firm pays the same as a small firm for a given transgression. While this is logical in that the fine is proportional to the damage caused, the fine administered has a weaker effect on the larger and presumably wealthier company.

The green credit policy punishes firms in a way that is approximately proportional to the size of the firm. Denial of credit to polluting firms affects firms of all sizes in proportion to the amount of money that they might want or need to borrow, assuming that larger firms require larger loans. By separating the degree of punishment from the size of offense, the policy may be more equitable.

Although the green export and green IPO initiatives also provide punishments that cut off access to capital, their proportionality to the size of the firm is less direct than that of the green credit policy. Because the green export initiative works by denying firms the right to export, it punishes firms in proportion to their reliance upon exports rather than their absolute size. Firms interested in producing solely for the domestic market would remain unaffected, while those that produce goods primarily for export would find themselves compelled to change their environmental practices or shut down. Similarly, the green IPO policy affects those firms that wish to become publicly traded companies. Firms without the need or interest in doing so would not change behavior because of this restriction.

4.2. Enforceability

Another advantage that most of the green market initiatives hold over traditional command-and-control regulation and pollution taxes is that they generally do not require the government to collect money from the offending firm. In countries that suffer from low governance capacity, collecting environmental fines and taxes often proves problematic. The environmental agency often lacks the labor and authority to force non-paying firms to shut down and firms often can go years without paying fines or pollution taxes. Even in countries with high levels of governance capacity, enforcing traditional command-and-control regulations and pollution taxes requires significant resources to discover violations and measure firms' pollution.

The green market initiatives, with the exception of the green insurance policy, do not require the collection of money from firms. Instead, they limit access to capital by denying credit, the right to export, and the right to issue IPOs. This reduces the burden on environmental agencies to collect fines and taxes. Instead of requiring firms to act, the policies allow the government to cut off resources to the firm. By partnering with economic bureaus, the environmental agency also leverages the enforcement capabilities of those bureaus to ensure that offending firms are punished, taking pressure off of the environmental agency's resources.

We summarize our comparison of punishment proportionality and enforcement methods in the green market initiatives and other environmental regulatory mechanisms in table 1.

Table 1. Proportionality and Enforcement of Environmental Policy Options		
Policy	Punishment Proportionality	Enforcement Technique
Traditional command and control	Tied to type and degree of damage caused	Government must uncover violations and collect fines
Pollutant tax	Tied to amount of specific pollutant emitted	Government must measure amount of pollutant emitted and collect tax
Cap and trade	Tied to amount of specific pollutant emitted	Incentive for firms to report competitors for violating environmental standards. Amount of pollutant emitted and number of credits owned must be calculated.
Green credit	Tied to value of loans required	Banks must be compelled not to loan to firms on environmental blacklist
Green export	Tied to degree of reliance upon exports	Government trade licensing agency denies export license to firms on environmental blacklist
Green IPO	Tied to level of interest in becoming a publicly traded company	National securities agency denies application to hold IPO to firms on environmental blacklist
Green insurance	Tied to perceived risk of causing a major environmental disaster	Government must collect insurance payments

4.3. Advantages of the Blacklist

With the exception of green insurance, all of China's green market initiatives operate on the concept of the blacklist: once a firm is blacklisted for environmental transgressions, it may lose partial access to the market. The addition of a firm to the blacklist may occur due to failure to pay fines, a history of violations, or a series of serious problems. The blacklist allows Chinese regulators flexibility on when to apply the policies. While this could create opportunities for abuse by unscrupulous officials, the flexibility of the blacklist allows regulators to take into account a firm's overall behavior and impact on local conditions before selecting the level of punishment. Under traditional regulations, whether command-and-control or market-based, the impact on a firm is often based almost completely on the amount of pollutant the firm emits. While some regulations, such as the U.S Clean Water Act, do examine the costs and benefits of remediation, this type of approach is not often considered. In cases where a firm is vital to the local economy and might collapse if forced to pay the full costs of its pollution, the blacklist allows regulators to consider social costs and provides alternatives to shutting down the firm. The threat

of the blacklist may provide enough incentive to the firm to begin to change its ways while allowing it the time to make the necessary adjustments.

Blacklists have another significant advantage: they are a clear indicator of poor environmental performance. Having an official blacklist of the worst polluting firms and outlining the green market initiatives published in the Chinese media and on SEPA's website helps raise awareness of environmental issues and provides a rallying point for the general public and environmental groups. In China, where environmental activism is considered less politically sensitive than other types of activism, increased public awareness has led to significant results (Economy, 2005). Firms that end up on the blacklist will not only suffer the direct punishment of the regulations but may face a backlash of public opinion.

Because of its simplicity, the blacklist lends itself well to boycotts and other types of public campaigns that can provide additional incentives to improve environmental stewardship. Environmental protection groups may pressure blacklisted firms to reform their practices, and blacklists may discredit firms in the eyes of their business partners, causing the socially conscious and risk averse to take their business elsewhere. This negative publicity could be a large incentive for polluting firms to change their behavior, as evidenced by successful consumer boycotts. For example, after boycotts of Nike products for the company's use of sweatshops, Nike was forced to make significant changes in the way its products were produced (Jackson and Schantz, 1993).

4.4. Synergies with Existing Regulation

The green market initiatives do not need to replace traditional regulations. Because the criteria for inclusion on the blacklist are based upon overall environmental performance rather than production of specific pollutants, they can be used to complement existing regulation. In China this seems to be the intent: failure to pay environmental fines is one publicized way to get on the blacklist (Chen S., 2007). In this sense, blacklists are a punishment of last resort: if other regulations fail to convince firms to change their behavior, then they will land on the blacklist and lose access to markets that sustain them.

5. Potential Pitfalls

The green market initiative basket contains intrinsic drawbacks that detract from the advantages of its innovative policy approach. First among these is the failure of the policies to address the low priority attached to environmental protection. While the policies offer new avenues of punishment, they do not represent a paradigm shift where environmental issues are given the same weight as economic considerations. As long as economic growth maintains its position of prominence in the minds of policymakers, economic affluence is likely to continually trump environmental protection, and the green market initiatives may have difficulty gaining political traction.

5.1. Lack of Incentives to Go beyond Mandates

No incentive is built into these initiatives to encourage firms to innovate beyond doing just enough to avoid the blacklist. Regulatory policies that encourage firms to push past the expectations of the regulatory agency need to include an incentive structure that allows firms to benefit from exceptional environmental stewardship. In this sense, pure market mechanisms are preferable.

For example, if a U.S. firm is found to violate of the National Ambient Air Quality Standard, under the Clean Air Act, it must reduce its emissions or pay a fine; however, it only has to reduce emissions to the maximum limit set by the U.S. Environmental Protection Agency to avoid the fine. In the same way, the green market initiatives incentivize firms to reduce their pollution only enough to avoid the blacklist. Reductions below this limit would likely cost more, but would achieve no additional monetary reward.

5.2. Unwilling Partnerships

Partnerships with powerful institutions and agencies are a necessary condition for the green market initiatives to succeed. These institutions range from central banks to regulatory commissions; without leveraging these collaborations, the environmental protection agencies would not possess the required authority to deny access to the aspects of the market that the green market initiatives seek to restrict. This cooperation may lead to unintended consequences.

The participation of multiple actors with differing interests in the creation and enforcement of these policies is likely to be more administratively cumbersome than the traditional command-and-control regulatory methods.

Coordination among agencies is difficult in the best of bureaucracies. Involving greater numbers of agencies in a regulation requires more resources and makes the responsibility for the success of the policies less clear, reducing the likelihood that the regulation will be effectively enforced.

Environmental agency cooperation with other governmental units may raise awareness of environmental concerns within non-environmental agencies and lead to further cooperation. Requiring the economic bureaus to cooperate with environmental policymakers may create a culture of awareness of environmental problems. This may in time lead economic policymakers to find areas of synergy among economic and environmental goals. While the cooperation may lead to these positive outcomes, it could reduce the autonomy and influence of an environmental agency because it must work with more powerful agencies to carry out the issue-specific mandates. If the partner agencies harbor conflicting political agendas—the promotion of economic growth, for example—they may use their clout to water down environmental standards in favor of their own goals.

Economic bureaus generally have significantly greater power than their environmental counterparts, and their cooperation gives greater weight to the enforcement of environmental policies. At the same time, an environmental agency's dependence on its partners raises the possibility of cooptation. GDP maximization will continue to dominate agendas of economic agencies. If the environmental standards enforced through the new initiatives are perceived as threatening economic growth, the economic agencies might use their partnership ties with the environmental agency to dictate policy decisions, undermining environmental protection and weakening the environmental agency.

5.3. Concerns with Blacklists

While the flexibility of the blacklist offers some benefits, its subjectivity provides major opportunities for abuse by unscrupulous officials. Without clear standards, the regulator's discretion might be bought by firms that do not want to be put on the blacklist or by those firms wishing to use the regulations to eliminate competitors. In addition, the public repercussions of being blacklisted may be difficult for regulators to gauge or control, which may lead to harsher than anticipated punishments. The blacklist also does not work well for targeting specific types of pollution because it is based on firms' overall environmental performance.

We summarize the advantages and disadvantages of blacklists in table 2.

Aspect	Advantage	Disadvantage
Subjectivity	Provides flexibility to regulators	Creates opportunities for official abuse
	Places burden of proof on firms to prove environmental compliance once blacklisting begins	
Conceptual simplicity	Clearly identifies to the public the firms with the worst environmental records. This could make listed firms targets of boycotts, for example.	May have greater consequences for firms than regulators intend
	Gives clear indication of consequences for firms	
Broad criteria	Allows punishment of firms for overall environmental performance	Does not help abatement of specific pollutants

5.4. Perverse Incentives

While banks have little incentive to cooperate with the green credit initiative, there exists significant incentive for them to resist participating. Banks make money by lending; blocking polluters from access to credit also cuts off banks from potential profits. This creates an incentive for noncompliance, especially if the central bank does not have control, explicitly or implicitly, over private banks. Banks have some reason to monitor one another: if a bank is not following the regulations, then a competitor may inform the regulators to hurt the violator's business. That said, the responsibility falls to the regulatory agency to punish banks that fail to comply, which may not be in the interest of an agency judged primarily on economic performance.

If the banking regulatory body does not have the ability (or incentive) to punish noncompliance in the absence of self-monitoring by the industry, banks have no reason to comply with the policy. To succeed, the green credit initiative must include significant enforceable penalties to avert bank non-compliance and create an atmosphere that encourages banks to monitor each other, thus reducing the administrative burden on the government.

5.5. Loopholes for Multinational Corporations

Multinational corporations, by virtue of operating in multiple national markets, have access to capital in ways beyond the regulatory reach of any of the agencies tasked with enforcing these policies. This hinders policy efficacy, as these firms can skirt the penalties with little hardship.

For example, multinationals have access to multiple stock markets around the globe. Denying an IPO listing on one stock market, say the Shanghai exchange, means little if an IPO can be issued in New York. Along the same lines, not all firms are publicly traded. Privately owned firms would not be affected by a delisting or a denial of an IPO.

Multinational corporations very often have access to capital outside of the country in which they operate. Denying credit to these firms would be ineffective if they can simply borrow from a bank outside the country of jurisdiction. Without an international policy on green lending, money always will likely be available to firms that need it. Additionally, the green export initiative may have limited effect on multinationals that produce within a country for domestic consumption, particularly in large markets. For example, Coca-Cola has facilities in Colombia that produce solely for the Colombian market (CokeFacts, n.d.). If it were found in violation of Colombian regulations, revoking its export license would have no effect.

Creative accounting practices could undermine many of these initiatives, especially when a company has many subsidiaries. Companies could receive funding through a subsidiary not affected by the blacklist. Green insurance and green IPOs are less susceptible to this than are green credit and green export licenses, because green insurance does not seek to deny access to capital and because the financial listing requirements for IPOs would include documentation of all holding companies and subsidiaries.

With adjustments, we think these pitfalls in green market initiatives can be overcome and the policies strengthened. We suggest some improvements in section 6.

6. Potential Improvements

In section 5, we reviewed a number of disadvantages of the green market initiatives. These include a lack of incentives to innovate beyond benchmark abatement schedules, administrative clumsiness of some policies, loopholes available to multinational corporations, and potential for abuse of discretionary power. Here, we propose policy alterations to address these pitfalls.

6.1. Motivating Innovation beyond Benchmarks

As with command-and-control environmental regulation, China's green market policies fail to provide incentives to innovate beyond the benchmark stipulated in the regulation. On the other hand, true market-based policies (such as taxes) provide incentives that reward firms that reduce pollution beyond regulatory goals. The green credit and green insurance policies have begun to offer similar incentives via subsidized rates for firms with solid environmental records (Chen S., 2007). We believe these policies could go further by instituting a dynamic benchmark that increases rewards to firms for greater compliance and increases punishments for less compliance.

Specific to the green credit and insurance policies, we propose a sliding scale to structure incentives. For this program, in addition to restricting loans to polluters and offering a single subsidized rate to green companies, a schedule of subsidized rates would be available to firms exceeding multiple levels of compliance. This creates a situation in which firms have incentives to reduce pollution beyond each benchmark to access successively lower interest rates. Additionally, the government could institute a series of higher interest rates offered to firms that are not fully in compliance, but not bad enough to make the blacklist, as a warning to lower-level violators. The additional revenues from these rates could be used to subsidize the lower interest rate schedules offered to firms exceeding compliance.

For the green insurance policy, we propose mandating pollution insurance for every firm—not just the high polluters—with a schedule of multiple premium rates. This would create an incentive structure similar to the green credit structure. The process is similar to any insurance underwriting process, whereby firms exhibiting higher risk of catastrophic pollution events would be required to pay higher insurance premiums. Provided these premiums are set at a high enough level to affect the firms' cost structure, firms would have the incentive to take action to reduce the risk of catastrophic pollution events to benefit from lower costs.

The U.S. Environmental Protection Agency offers a performance track program that rewards firms that exhibit exceptional environmental stewardship. Members of the program are eligible for an array of benefits, including reduced reporting requirements, expedited permitting, and fewer inspections (U.S. Environmental Protection Agency, n.d.). While the benefits are not financial and may not be incentive enough for highly polluting firms to change their behavior, the program is an example of motivating environmental protection beyond the standards.

6.2. Addressing Administration Issues

Many of the green market policies require the government to collect data from firms to ensure compliance. This sort of data collection requires significant resources of time and money. To minimize public costs, we propose to “flip” some of the punishments to rewards, shifting the onus of data collection onto firms by requiring applications. For example, along with denying credit to egregiously polluting firms, the regulation provides subsidized loans for green firms. The agency could require firms to apply for the beneficial rates, thus shifting the burden of proof of environmental performance to the firm. In the United States this occurs often in state- and utility-run energy efficiency rebate programs: companies must provide proof that they exceed the required standards, rather than forcing the government to prove that they are not. The government likely would have to check a portion of the applications, but the select audits would require fewer resources than monitoring all firms and restricting those in violation. Any of the policies could be switched in this way; the idea is to provide a “carrot” instead of a “stick” and shift the burden of proof—along with the cost of accounting—onto the firm.

More generally, we propose that the government create a “green list” to complement (or replace) the blacklist. A green list would additionally take advantage of the public awareness externality. Consumer groups and major retailers could look to the green list and make consumption decisions that could, in turn, increase the manufacturer’s initiative to meet requirements for the green list. Again, making the green list would be the responsibility (and goal) of the manufacturing firms, which would shift costs away from public funds. One example of a similar experiment is the Global 100: Most Sustainable Corporations in the World. The list provides a simple way for any individual to see which firms conduct business with the highest degree of environmental stewardship. The Global 100 appears to be having some impact as it has been cited numerous times over the past few years (Global 100, n.d.). The methodology is built from Innovest, a private company that

attributes a rating to many publicly traded firms based on environmental and social responsibility (Innovest, n.d.). If a national government devised a similar list, it might carry even more authority domestically.

6.3. Closing Loopholes for Multinational Corporations

Green market policies might not harm multinational corporations. If these multinational corporations require no local capital and only produce goods for domestic consumption, these policies—with the possible exception of green insurance—likely would create no behavioral changes in the firms. We propose that the green export policy be expanded to include imports, so that more multinational corporations would be induced to comply with regulations. Import restrictions leverage the market from a different angle than do export limits. Instead of blocking firms' final product from reaching the intended markets, an import restriction would cut off firms' inputs. While a multinational corporation may produce goods for local consumption, it is unlikely that all of the inputs can be purchased locally. This type of policy could be most effective in smaller economies that have highly concentrated manufacturing sectors by reducing the number of locally produced inputs. This policy addition gives regulators one more creative way to restrict access to necessary parts of a market in the effort to change behavior.

6.4. Limiting Opportunities for Corruption

With the exception of green insurance, the green market initiatives rely on a blacklist of offenders. It is conceivable that a blacklist could add to an environment already highly conducive to corruption. We propose a few provisions to mitigate the prospects for corruption. Transparency and the required provision of information to the public improve governance (Islam 2003). In designing a new policy, policymakers should require regulatory implementing agencies to publicly report on activities to reduce the chance of corrupt practices occurring. Providing salient requirements to avoid blacklisting, along with transparency in decision-making, would make it more difficult for regulators to blacklist a firm for reasons other than non-compliance. Explicitly stating the reasons for blacklist status alongside the names of the firms could reduce subjectivity on the part of the regulators, thus reducing prospects for corruption.

We summarize our proposals to improve the green market initiatives in table 3.

Table 3. Improvements on Green Market Policies			
Pitfall	Policies Affected	Suggested Alteration	Explanation
No incentive to innovate beyond benchmark	<ul style="list-style-type: none"> • Green credit • Green IPO • Green exports 	Create a sliding scale to encourage innovation at all levels of pollution abatement	Only applicable for green credit because creation of a sliding scale of benefits for IPOs or access to export markets is impossible
Administratively burdensome	<ul style="list-style-type: none"> • Green credit • Green IPO • Green exports • Green insurance 	Offer benefits instead of punishments	Providing positive incentives for firms to disclose information may reduce costs associated with collecting information
Lack of effect on multinational corporations	<ul style="list-style-type: none"> • Green credit • Green IPO • Green exports 	Restrict access to imported inputs	Restricting imports as well as exports may have a greater effect than current policies on multinational corporations
High likelihood of corruption	<ul style="list-style-type: none"> • Blacklist 	Publicize standards and reasons for listing	Corruption remains a potential problem but blacklist could minimize opportunities for abuse

Recommendations

Environmental degradation is a pressing issue. Climate change, poor air quality, desertification, water contamination, and a wealth of other negative impacts of pollution are destroying the environment and damaging public health around the globe. China, which suffers from these impacts at least as acutely as any nation, has been forced to innovate in its environmental policies. We think that the basket of green market initiatives, China's most recent attempt to get a handle on its rampant pollution problem, offers lessons from which policymakers worldwide can learn.

Our analysis of the advantages and disadvantages of these green market initiatives leads us to conclude that these are innovative new methods that can be utilized for environmental protection. We believe that policies derived from China's initiatives would be best implemented within a framework of traditional policies: as a last line of punishment for the worst offenders and as a frontline set of rewards for firms that exceed the baseline environmental standards set by government. A firm that has a history of pollution violations or that refuses to pay fines and make operational changes should be subject to the blacklist and restricted access to aspects of the market. At the same time, firms with exceptional environmental records that go beyond existing regulations should be rewarded with green list status and preferential rates. Strong traditional environmental regulations are still necessary to set standards and baselines; these new initiatives should not be thought of as a replacement of the status quo, but rather as a way to augment the existing set of regulations to increase compliance and encourage firms to excel.

Works Cited

- Barboza, D. (2007, November 1). China Suspends Export Licenses of More than 700 Toymakers. *International Herald Tribune*. Retrieved April 10, 2008, from www.iht.com/articles/2007/11/01/business/toys.php
- BBC News. (2007, July 3). China Buried Smog Death Finding. Retrieved February 15, 2008, from: www.news.co.uk/2/hi/asia-pacific/6265098.stm
- Bezlova, A. (2007, July 11). A Carrot for China's Polluters. *Asia Times Online*. Retrieved February 8, 2008, from: www.atimes.com/atimes/China_Business/IG11Cb02.html
- Chen, C.-C., Gong, G.-C., & Shiah, F.-K. (2007). Hypoxia in the East China Sea: One of the Largest Coastal Low-Oxygen Areas in the World. *Marine Environmental Research*, vol. 64, no. 4 pp. 399-408.
- Chen, S. (2007, July 31). Top Creditors Still in the Dark about Green Regulations. *South China Morning Post*, p. 4.
- China Daily*. (2007a, December 24). Firms May Have to Reveal Green Details. Retrieved April 1, 2008, from www.chinadaily.com.cn/china/2007-12/24/content_6342341.htm
- China Daily*. (2007b, August 21). Heavy Polluters Face IPO Hurdle. Retrieved April 12, 2008, from www.chinadaily.com.cn/bizchina/2007-08/21/content_6035072.htm
- China Environmental News*. (2008). China's Environmental Watchdog Announces Green Insurance System. Retrieved February 15, 2008, from www.china-environmental-news.blogspot.com/22008/02
- Chou, T. (2007, December 12). New PRC Anti-Pollution Notice Targets Exporters. Retrieved March 3, 2008, from www.moneydaq.com/article.asp?articleid=55238
- CokeFacts. (n.d.). Colombia: Our History in Colombia. Retrieved April 25, 2008, from www.Cokefacts.com/colombia/bg_co_history.shtml
- Coonan, C. (2007, July 24). China Blocks Report Costing Environmental Damage. *Irish Times*, p. 11.
- Diamond, J., & Liu, J. G. (2008, January 4). Revolutionizing China's Environmental Protection. *Science*, pp. 37-38.

- Economy, E. C. (2005, February 7). China's Environmental Movement. Retrieved March 10, 2008, from www.cfr.org/publication/7770.
- Economy, E. C. (2004). *The River Runs Black: The Environmental Challenge to China's Future*. Ithaca, New York: Cornell University Press.
- Elperin, J., & Mufson, S. (2007, April 1). Tax on Carbon Emissions Gains Support. *Washington Post*, p. A05.
- Encyclopedia Britannica*. (2008). Beijing. Retrieved April 25, 2008, from www.britannica.com/eb/article-60546
- Global 100. (n.d.). Global 100: Most Sustainable Corporations in the World. Retrieved April 25, 2008, from www.global100.org/what.asp
- Hernandez, V. (2008, February 18). China Introduces Green Insurance System. All Headline News. Retrieved March 15, 2008, from www.allheadlinenews.com/articles/7010067791
- Innovest. (n.d.). *Innovest: Strategic Value Advisors*. Retrieved April 17, 2008, from www.innovestgroup.com
- International Herald Tribune*. (2007, July 30). Green Credit: To Fight Pollution China Takes the Capitalist Route. Retrieved May 18, 2008, from www.ihrt.com/articles/2007/07/30/business/pollute.php
- International Herald Tribune*. (2008, February 25). China Imposing Green Policy on Companies. Retrieved April 5, 2008, from www.ihrt.com/articles/2008/02/25/business/chigreen.php
- Islam, Roumeen. (2003, June). Do More Transparent Governments Govern Better? World Bank. Retrieved April 4, 2008 from www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2003/07/08/000094946_03062104301553/Rendered/PDF/multi0page.pdf
- Jackson, J. E., & Schantz, W. (1993, January-February). Crisis Management Lessons: When Push Shoved Nike--Boycott of Nike by People United to Serve Humanity. *Business Horizons*. Retrieved March 27, 2008, from www.findarticles.com/p/articles/mi_m1038/is_n1_v36/ai_13594625
- Jiang, T. S. (2007, October 16). Green GDP Plan Stays on Back Burner. *South China Morning Post*. Retrieved February 13, 2008, from www.archive.scmp.com/showarticles.php

- Kahn, J., & Yardley, J. (2007, August 26). Choking on Growth: As China Roars, Pollution Reaches Deadly Extremes. *New York Times*. Retrieved February 15, 2008, from www.nytimes.com/2007/08/26/world/asia/26china.html
- Ma, J. (2007, September 10). Beijing Drafting New Laws to Create Greener Business Environment. *South China Morning Post*. Retrieved February 16, 2008, from www.wilsoncenter.org/index.cfm?topic_id=1421&fuseaction=topics.item&news_id=274906.
- Money Week*. (2007, March 16). Can China Go Green? Retrieved March 17, 2008, from www.moneyweek.com/file/26925/can-china-go-green.html
- Ng, E., & Ren, D. (2007, November 13). Beijing Acts to Make Green Efforts a Must for IPOs. *South China Morning Post*. Retrieved February 13, 2008, from www.archive.scmp.com/showarticles.php
- Novexcn. (n.d.). *Implementation Measures of the Ministry of Foreign Economic Relations and Trade Concerning the Application for Import and Export*. Retrieved March 4, 2008, from www.novexcn.com/im_exp_applicat.html
- Red Orbit*. (n.d.). China Introduces “Green Insurance” to Curb Pollution. Retrieved March 15, 2008, from www.redorbit.com/news/display/?id-1258425
- Ren, X. (2007, September 25). Annual Environmental Report Shows Limited Progress in China’s Pollution Control. *Global Insight*. Retrieved February 28, 2008, from www.globalinsight.com
- Ross, L. (1998). China: Environmental Protection, Domestic Policy Trends, Patterns of Participation in Regimes and Compliance with International Norms. *The China Quarterly*, no. 156, Special Issue, pp. 809-835
- Siciliano, M. (2006, March 15). First Development, Then Environment: Environmental and Water Scarcity Issues in China. *The Heinz School Law Review*. Retrieved March 10, 2008, from www.journal.heinz.cmu.edu/articles/first-development-then-environment/
- South China Morning Post*. (2007, July 6). Heavy Polluters to be Denied Loans. Retrieved February 13, 2008, from www.archive.scmp.com/showarticles.php

- The Economist*. (2005, October 22). The Greening of China. Retrieved April 20, 2008, from www.economist.com/displayStory.cfm?story_id=5061453
- The Local*. (2007, September 17). Carbon Taxes Raised to Combat Climate Change. Retrieved March 8, 2008, from www.thelocal.se
- The Standard*. (2008, February 26). Polluter Firms Hit with IPO Clamp. Retrieved March 15, 2008, from www.thestandard.com.hk/news_detail.asp?pp_cat=1&art_id=62043&sid=17762616&con_type=1
- U.S. Environmental Protection Agency. (n.d.). National Environmental Performance Track. Retrieved April 28, 2008 from www.epa.gov/performancetrack/index.htm
- World Bank. (2007a). *Cost of Pollution in China*. Retrieved March 3, 2008 from World Bank: www.siteresources.worldbank.org/INTEAPREGTOPENVIRONMENT/Resources/China_Cost_of_Pollution.pdf
- World Bank. (2007b). *East Asia and Pacific Update*. Retrieved February 2008, from World Bank: www.web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIPACIFICEXT/EXTEAPHALFYEARLYUPDATE/0,,contentMDK:21548625~pagePK:64168445~piPK:64168309~theSitePK:550226,00.html
- World Trade Organization. (n.d.). *Trade Profiles: China* Retrieved March 10, 2008, from www.stat.wto.org/CountryProfile/WSDBCountryPFView.aspx?Language=E&Country=CN
- Xinhua News Agency. (2007a, October 30). China's Environment Watchdog to Strengthen Supervision of Exporters. *China Vie*. Retrieved April 12, 2008, from www.english.gov.cn/2007-10/31/content_791018.htm
- Xinhua News Agency. (2007b, November 16). 12 Heavy Polluters Punished Under New "Green Credit" Policy. *China Daily*. Retrieved February 19, 2008, from www.en.bcnq.com/china/2007-11/16/content_6259777.htm