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# **ENVIRONMENTAL DISCLOSURE IN CHINA: AN EXAMINATION OF THE GREEN SECURITIES POLICY**

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## **ENVIRONMENTAL DISCLOSURE IN CHINA: AN EXAMINATION OF THE GREEN SECURITIES POLICY**

### **ABSTRACT**

In 2008, China launched the Green Securities Policy to increase sustainability practices among companies listed on Chinese stock markets. One of the integral components of the policy is the environmental disclosure regulation, which directs publicly traded Chinese companies in 14 highly polluting industries to report required environmental information. This research seeks to explore the Green Securities Policy in two ways. First, it determines the level of compliance with environmental disclosure requirements from 2008 to 2010 by companies covered under the Green Securities Policy. The findings suggest that the levels of environmental disclosure by the companies reviewed slightly increased but remained somewhat low from 2008 to 2010, in the range of 60%. Second, the research examines the dynamics underlying environmental disclosure by Chinese listed companies through the lens of Ecological Modernization Theory. While China's ecological modernization has created an increasingly favorable environment for environmental disclosure regulation, the research highlights current problems that have impeded the progress of environmental disclosure by listed companies.

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## **ENVIRONMENTAL DISCLOSURE IN CHINA: AN EXAMINATION OF CHINA'S GREEN SECURITIES POLICY**

### **INTRODUCTION**

In July 2010, the largest gold producer in China, Zijin Mining Group Co., Ltd, a company whose shares are publicly traded on the Shanghai Stock Exchange, disclosed that its operation in Fujian Province suffered a major toxic spill. Zijin Mining did not disclose much detail in its announcement, and it was later reported that the spill released 2.4 million gallons of acid copper solution from its mine in Fujian Province, into the Ting River, a large local waterway. This event caused a stir both domestically and internationally. It resulted in a direct economic loss of \$4.8 million in the local area, killed 2000 metric tons of fish (enough to feed 72,000 people for a year), and most importantly, endangered the health and safety of local residents. Another notable aspect of the spill is that it was not disclosed to the public until nine days after the incident occurred (Natural Resources Defense Council, 2010; Xiao, 2010). The government of China requires rapid public disclosure of such events, particularly with regard to publicly traded Chinese companies, yet Zijin did not immediately report its accident as required.

This event represents only one of many environmental impacts resulting from China's rapid economic growth. These growing environmental challenges have prompted the government to adopt a number of green policy initiatives in recent years that are designed to improve the country's environmental performance without diminishing economic growth. One of these initiatives is the Green Securities Policy, released in 2008, which embodies a goal of making transparent, and ideally mitigating, the financial and environmental risks associated with publicly traded Chinese companies in the 14 industries it classifies as "highly polluting industries." This includes thermal power, steel and iron, cement, aluminum, coal, metallurgy, building materials, mining, chemicals, oil, pharmaceuticals, light industry, and textiles and leather (Matisoff & Chan, 2008). The environmental disclosure requirement included in this policy is a vital component of the new regulation, establishing a range of environmental information that is to be reported by Chinese companies in these industries.

As the case of Zijin Mining demonstrates, compliance with the policy is lacking. This study seeks to ascertain the extent to which there is some level of compliance, and to understand how this example of environmental disclosure reflects the trajectory of political and social change in China in response to growing environmental challenges. To that end, we first evaluate the level of compliance (the percent of firms complying with environmental disclosure requirements) from 2008 to 2010 by the listed companies in highly polluting industries covered under the Green Securities Policy, looking at the annual reports of all companies in the 14 highly polluting industries (data from 2011 and 2012 were not available). It uses the seven categories provided in the Shanghai Stock Exchange's 2008 environmental disclosure guidelines to measure compliance. These criteria include environmental policies and goals, resources used, production and disposal of wastes and pollutants, and environmental investments and facilities, among others. Second, this study seeks to capture the dynamics underlying environmental disclosure of listed companies by using the lens of Ecological Modernization Theory (EMT). This theory offers an environmental framework to examine changing institutional developments and social practices of societies undergoing the institutionalization of environmental governance. Our analysis seeks to test the utility of EMT in examining the implications of compliance with environmental disclosure rules in China. The aim is to better understand the dynamics in China's ecological modernization by looking at its political and institutional evolution with respect to environmental governance.

## **CORPORATE ENVIRONMENTAL DISCLOSURE**

Corporate environmental disclosure, understood as the set of information that relate to a firm's past, current and future environmental activities and performance, as well as the associated financial implications (Berthelot, Cormier, & Magnan, 2003), has expanded significantly around the world in recent years. National governments, international institutions, academics and civil society have called for greater information, not only to inform policymakers, but also to enable populations the "right-to-know" the environmental impacts of industry and economic development (Kraft, Stephan, & Abel, 2011). The aim has been to push companies into disclosing their environmental information by placing them under multifaceted pressures from governments, markets and civil society (Rothenberg & Stanley, 2004). While demands from financial stakeholders and regulatory

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pressures have been the key factors that drive companies towards more environmental disclosure (Cormier & Magnan, 1999; Lee & Hutchison, 2005; Neu, Warsame, & Pedwell, 1998; Walden & Schwartz, 1997), companies have taken initiatives to voluntarily disclose their environmental records and build their green credentials. From an economic perspective, environmental disclosure can be seen as a reflection of companies' calculations of the potential costs and benefits related to the disclosure of their environmental information (Cormier & Magnan, 1999; Lee & Hutchison, 2005). From a social/political perspective, environmental disclosure can be understood as a legitimizing practice, serving as a tool for companies to legitimize their environmental management and business operations, and avoid legal, social and political sanctions, especially with regard to environmental accidents (Anbumozhi, Chotichanathawong, & Muruges, 2011; Berthelot, Cormier, & Magnan, 2003).

International institutions have developed standards that aim to encourage wide adoption of corporate environmental disclosure and standardize global practices. Among the international codes, one of the most popular is the Global Reporting Initiative, a framework that provides a set of guidelines and standards for economic, environmental and social disclosure. Its requirements cover a range of themes, including materials, energy, water, biodiversity, emissions, effluents and waste, products and services, compliance and transport (Global Reporting Initiative, n.d.). Additionally, many national governments have adopted diverse mandatory environmental disclosure programs to enhance their environmental governance, especially after conventional command-and-control measures have failed to deliver the promised results (Garcia, Sterner and Asfah, 2007; Wang, et al., 2004). Still, the reliability of environmental disclosure is often called into question. The information disclosed has been found to be selective, tending to be mostly positive, biased, and subject to managers' discretions (Berthelot, Cormier, & Magnan, 2003; Neu, Warsame, & Pedwell, 1998).

While the majority of the literature on corporate environmental disclosure focuses on the developed world, there is a growing body of literature addressing disclosure in developing countries, particularly in light of their weak institutions (Anbumozhi, Chotichanathawong, & Muruges, 2011; Blackman, 2008). A few case studies of successful environmental disclosure programs in developing countries highlight that the key lies in the careful design and implementation of environmental disclosure programs (Al-Tuwaijri, Christensen, & Hughes II, 2004; Blackman, 2008; Garcia, Sterner &

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Afsah, 2007). Notwithstanding a few successful cases, however, the literature suggests generally low levels and poor quality of environmental disclosure and its marginalization in corporate practices in the developing world (Brown, Tower, & Taplin, 2004; Elijido-Ten, 2011; Hossain, Islam, & Andrew, 2006; Lodhia, 2004; Uwalomwa & Uadiale, 2011).

Research on China's corporate environmental disclosure, most of which is written in the Chinese language, started only recently, and has expanded since 2007, as the country has increasingly adopted green initiatives to combat the country's environmental challenges. Several studies have assessed the levels, quality and attributes of the environmental information disclosed by Chinese companies. Their financial performance, industries, ownership structures and locations have been examined but with no consensus on whether they significantly affect the levels of environmental disclosure made by the companies (Xin & Wang, 2009; Yang, Li, & Shen, 2011; Zhang, et al., 2008; Zhong, Zhang, & Zhang, 2011). Company size is the only factor agreed upon in the literature to have a statistically positive relation with disclosure levels (Xin & Wang, 2009; Zhong, Zhang, & Zhang, 2011), though Yu, Jian and He (2011) did demonstrate a positive impact of environmental disclosure on the economic performance of several companies.

In general, some patterns have emerged. First, environmental disclosure is increasing over time, yet with low levels, inconsistent quality and widely varying contents that are hard to compare. Second, much of the information is partial and includes positive rhetoric lacking in substance. Disclosure – not only in China – is generally subject to managers' discretion and highly susceptible to "green-washing" (Rothenberg & Stanley, 2004, p. 104). Lastly, some evidence indicates differences in the levels of environmental disclosure, with highly polluting industries disclosing more information than other sectors (Hu & Liu, 2011; Li & Guo, 2011; Shen & Li, 2010; Wang, Fang, & Xing, 2009).

This study seeks to expand on the growing body of literature that examines environmental compliance in China, looking specifically at publicly traded companies listed on the Shanghai and Shenzhen stock exchanges that are included in the classification of highly polluting industries.

## **A ROADMAP OF CHINA'S GROWING ENVIRONMENTAL POLICY FRAMEWORK**

Although fraught with rising environmental challenges, China has arguably built a fairly sound

environmental policy system with its institutional efforts. The general trend over the years has indicated the growing importance of environmental issues in the state agenda, with advances in the environmental legal framework, greater institutional capacities and enforcement, and the increasing integration of economic tools and public participation. The evolution of China's environmental policies can be roughly broken down to four major periods.

Prior to China's reform and opening up in 1978, when environmental issues were not a major concern, rising environmental damage and pollution levels were expected and not systematically addressed. Over time, the continued massive development of heavy industries, along with the growth of an international environmental movement (including the 1972 United Nations Conference on the Human Environment, in which China participated), increasingly drew the state's attention to environmental protection. Hence, a number of environmental agencies and regulations were put in place by the end of the 1970's, providing a basis for the development of environmental policies (R. Ye, 2008; Zhou & Ji, 2009).

The period of 1978 to 1991 marked major progress in China's environmental policies, as increased development and the associated pollution challenged the country's environmental capacities. Environmental protection became a part of state policy as well as an item in the national economic and social development plan. Legally, it was written into the Constitution and legislated as the Environmental Protection Law at the end of 1970s. Based on this foundation, a burgeoning environmental legal framework was built by 1991, including a large body of new environmental laws and regulations. Institutionally, in 1988 the state environmental agency was upgraded to a low vice-ministry status to enhance national environmental management (R. Ye, 2008; Zhou & Ji, 2009).

During the period from 1992 to 2002, as environmental quality deteriorated in the face of rapid industrialization, environmental protection gained greater importance in the state agenda and environmental management was strengthened. The state environmental agency was elevated to the ministry-level State Environmental Protection Administration (SEPA). Environmental policies began to include economic tools and market mechanisms in order to provide economic incentives for good environmental practices. Moreover, a greater focus was placed on pollution and emission controls, and the state started to promote cleaner production, along with green industries and technologies (R. Ye, 2008; Zhou & Ji, 2009).



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Since 2003, as environmental problems have tended to impact public health and national growth, (a problem China has placed a high priority on environmental issues and taken a more aggressive, integrated approach to managing its environment. The environmental regulatory framework has been enhanced to address new environmental challenges. Among these changes was the promotion of SEPA in 2008 to a cabinet-level ministry, the Ministry of Environmental Protection (MEP). In addition, greater focus has been directed toward the improvement of local environmental monitoring and environmental policy implementation. Environmental policies have attempted to curb the impacts of environmentally sensitive industries, such as energy-intensive, emission-intensive, and highly polluting industries, while seeking to promote resource use efficiency and recycling. Additionally, new green policies have embraced more economic tools and market mechanisms and allowed a growing space for public participation (R. Ye, 2008; Zhou & Ji, 2009).

It is in this context that the MEP has developed a series of environmental economic policies, seeking to take a more holistic and systemic approach to designing and implementing policies to address what have become acute environmental problems. Based on market mechanisms, this series of policies utilizes economic tools, such as pricing, taxes, credits, fees and insurance to overcome environmental externalities and influence market behavior to strike a better balance between economic development and environmental protection (Chinese Academy for Environmental Planning, 2007). Initiating this effort in 2007 was the Green Credit Policy, by which MEP, the People's Bank of China, and the China Banking Regulatory Commission sought to direct credit away from highly polluting and high energy consuming industries and projects, and instead provide favorable credit terms for projects and industries demonstrating energy conservation and emissions reduction (PRCEE, 2010, p. 14). The following year, the Green Insurance Policy came into effect, requiring companies in selected polluting industries to purchase environmental liability insurance (Wu, J., 2008). China also launched the Green Securities Policy in 2008 (State Environmental Protection Administration, 2008). Seeking to link both environmental and financial policy, the Green Securities Policy was co-developed by MEP and the China Securities Regulatory Commission (CSRC). It targets Chinese companies in highly polluting industries and aims to restrain their excessive expansion, improve their environmental performance, and control their financial risks (State Environmental Protection Administration, 2008). The policy includes a "Green IPO" element, which involves a

mandatory environmental inspection that companies in highly polluting industries must undergo before conducting their initial public offerings or before they can qualify for refinancing. The policy also contains an environmental disclosure and environmental performance assessment (Matisoff & Chan, 2008). While the Green IPO has been widely enforced, the efforts to enforce environmental disclosure and environmental performance assessments have lagged behind.

## **ENVIRONMENTAL DISCLOSURE REGULATIONS IN CHINA**

Although environmental disclosure as directed by the Green Securities Policy is a new regulation, environmental disclosure is somewhat a familiar theme in China's evolving environmental policy system. The idea is embedded in places throughout the Constitution, as well as statutes addressing the criminal, corporate and environmental codes (Guo, 2005; Lin, 2010). One of the earliest environmental disclosure programs was the Green Watch program, co-developed by the MEP and the World Bank at the end of 1990s. Based on Chinese companies' environmental records, the program used a five-color system to rate their environmental performance and then reported the ratings to the public (Guo, 2005; Wang, et al., 2004). After some successful pilot efforts, the program was adopted in other sites throughout the country after 2006, with some measureable success. (Jin et al, 2010). Additionally, the MEP released environmental disclosure guidelines in both 2003 and 2007. The 2003 guidelines included mandatory and voluntary disclosure requirements for the polluting companies named by local environmental agencies (State Environmental Protection Administration, 2003). The *Environmental Information Disclosure Decree* issued in 2007 prescribed that both Chinese environmental agencies and companies should report required environmental information to the public (State Environmental Protection Administration, 2007a).

China's corporate social responsibility (CSR) initiative has also built a good foundation for and complement to the environmental disclosure regulations under the Green Securities Policy. CSR has been written into laws and regulations, such as the new *Company Law* in 2005 and the CSR guide for Chinese State-owned Enterprises (SOEs) in 2008, to promote CSR practices among Chinese companies (Lin, 2010; Moon & Shen, 2010; SAIC 2005 SASAC, 2008). In addition, both the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE) have taken initiatives in CSR reporting and socially responsible investing. In 2006, SZSE released its CSR guidelines, encouraging companies

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traded on its exchange to publish their CSR reports and disclose their social and environmental information (Organisation for Economic Co-operation and Development, 2011; Lin, 2010). In 2009, both of the stock exchanges released their social responsibility indices – the SSE Social Responsibility Index and the SZSE Corporate Social Responsibility Index – which disclose the market performance of top listed companies in CSR practices (Shanghai Stock Exchange, 2009; Shenzhen Stock Exchange, 2011a).

The Green Securities Policy, adopted in 2008, embodies the latest efforts regarding environmental disclosure. The regulations require Chinese listed companies in 14 highly polluting industries that trade “A” shares on the SSE and the SZSE to report certain environmental information to the public. According to MEP’s industrial roster in 2008, the 14 highly polluting industries involve “thermal power, steel and iron, cement, aluminum, coal, metallurgy, building materials, mining, chemicals, oil, pharmaceuticals, light industry, textiles and leather” (Matisoff & Chan, 2008, p. 8; Ministry of Environmental Protection, 2008). This includes hundreds of companies. To date, three official documents have been released to address the specific environmental disclosure requirements.

1. The explanatory statement and guide of the Green Securities Policy, *Instructing Opinions on How to Enhance Environmental Protection Monitoring and Management of Listed Companies*, released by the MEP in February 2008 (State Environmental Protection Administration, 2008)
2. SSE’s environmental disclosure guidelines, *Guidelines on Environmental Information Disclosure of Listed Companies on Shanghai Stock Exchange*, issued in May 2008 (Shanghai Stock Exchange, 2008)
3. *A Guide on Listed Companies’ Environmental Information Disclosure (Draft)* (hereafter the *Guide*) released by MEP in September 2010 (Ministry of Environmental Protection, 2010).

One of the notable features of these newly drafted requirements and guidelines is the ambiguity,

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lack of specificity, and inconsistency of environmental disclosure rules for listed companies. For example, the MEP guidelines specify eight categories to report on, while the SSE guidelines specify seven. With regard to immediate disclosure during environmental emergencies, there are additional important differences. The first two documents listed above (*Instructing Opinions* and the SSE guidelines) implicitly reference such emergencies, stating that companies must report “important environmental issues likely to have big influences on stock prices.” The *MEP Guide*, by contrast, explicitly requires disclosure during environmental emergencies. Further, while the *Instructing Opinions* requires immediate disclosure, it provides no clear definition of what “immediate” means. The SSE guidelines mandates disclosure no later than two days after the occurrence of incidents, and the *Guide* requires disclosure within one day.

**Table 1: Environmental Disclosure Requirements under the Green Securities Policy**

**Table 2: Environmental Information Required in SSE’s Environmental Disclosure Guidelines**

**CHINESE STOCK MARKETS AND THE GOVERNANCE OF LISTED COMPANIES**

Built from scratch in the early 1990s, Chinese capital markets have undergone rapid growth. By the end of 2011, 2,342 companies were listed in the stock markets with a total market capitalization of 21.5 trillion RMB, or around 3.3 trillion in US dollars, ranking third in the world only next to the United States and Japan (China Securities Regulatory Commission, 2011). In recent years, the markets have boasted a multi-tiered structure to meet diverse demands of companies and investors and to control financial risks. There are three major market tiers with differing listing criteria. The Main Board is tailored to large and well-established companies with outstanding financial performance, usually including large state-owned enterprises (SOEs) and large national firms. The SME Board, begun in 2004, serves as a financing channel for small and medium companies with relatively mature growth. The ChinNext Board, in existence since 2009, is specifically for start-up companies with innovative technologies or business models in order to nurture entrepreneurship in China (Shenzhen Stock Exchange, n.d.).

Moreover, two types of stocks are traded in the markets, known as “A” shares and “B” shares. A shares are priced in RMB and are primarily available to domestic investors. By contrast, B shares are

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traded in US dollars and are available to both domestic and foreign investors (China Securities Regulatory Commission, 2011). It should be noted that A shares are accessible to a limited number of large qualified foreign institutional investors (QFIIs) approved by the Chinese government since 2002 (Ewing, 2005). By the end of 2011, 135 QFIIs were allowed to trade A shares in the Chinese markets, but these investors only held a market value accounting of 1.07% of the total market value of A shares in circulation in China (China Securities Regulatory Commission, 2011).

The Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE) are the two major venues for companies to raise capital. They set market rules, approve listings, directly monitor and oversee market activities of listed companies (Organisation for Economic Co-operation and Development, 2011). While the SSE offers listings for Main Board A shares and B shares, the SZSE has listings for Main Board A shares and B shares, SME Board A shares and ChinNext Board A shares.

Chinese stock markets, along with the companies listed on the exchanges, have been regarded as important strategic assets in the country's development, and are a high priority of the state. The stock markets have been used as a tool to revive Chinese SOEs and maintain a strong state influence on listed companies that are viewed critical to China's growth trajectory (Ewing, 2005; Jia & Tomasic, 2009; Organisation for Economic Co-operation and Development, 2011; Yang & Sanders, 2007). Hence, it is not surprising to see state dominance in Chinese capital markets even after several rounds of reforms (Bell & Feng, 2009; Li & Zhang, 2010).

The institutional framework that has evolved to govern and regulate Chinese listed companies is quite complex, as multiple agencies at the national and local level exercise varying degrees of both direct and indirect control over companies. As illustrated in Figure 1, there are a multitude of agencies and stakeholders involved in the process. Within this framework, the Chinese government maintains control by adopting two strategies. First, it exerts direct influence through its role as the actual controller (or controlling shareholder) of the SOEs that are listed companies, allowing the state to leverage its power via internal corporate governance. Second, there is the process of externally monitoring listed companies and the markets in general through the securities regulatory agencies (Jia & Tomasic, 2009). Internal governance of the state-controlled listed companies is closely monitored by the State-owned Assets Supervision and Administration Commissions (SASACs), through the supervision of controlling shareholders. On behalf of the state, SASACs have the rights

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as investors, including appointment and assessment of key personnel, as well as oversight of state-owned assets (Organisation for Economic Co-operation and Development, 2011). Thus, key corporate personnel – the board of directors, supervisory board, and management team – are in effect governed by SASACs, which allows the internal governance of state-controlled listed companies to be in line with the state agenda (China Securities Regulatory Commission, 2002; Jia & Tomasic, 2009). At the same time, power and influence flow in both directions because of this institutional arrangement: state-controlled listed companies benefit from special power and influence in the larger state governance apparatus (Jia & Tomasic, 2009; Yang & Sanders, 2007). The second way in which governance of listed companies is carried out involves the external regulatory approach. This is the responsibility of the China Securities Regulatory Commission (CSRC), which oversees the stock markets and listed companies in China. The regulatory network of the CSRC is comprised of the two stock exchanges, SSE and SZSE, and local securities regulatory bureaus (SRBs), which monitor local listed companies under their jurisdictions.

### **Figure 1: The Institutional Governance Framework for Chinese Listed Companies**

With respect to environmental regulation and governance, the system becomes even more complex, as the institutional framework is overlaid by environmental agencies. At the top of this framework is the Ministry of Environmental Protection (MEP), which formulates, directs and enforces national environmental regulations and policies, and seeks to encourage or compel the improvement of environmental violators. In addition to the MEP, local governments play a role in their jurisdictions, along with local SASACs and Environmental Protection Bureaus (EPBs), which seek to track companies' environmental performance and support the objectives of the MEP. As the key players within their areas of influence, local government officials and agencies hold considerable power to influence environmental governance of listed companies through 1) the oversight of local EPBs and local SASACs, and 2) in their relations with the management of local companies. Further complicating the entire arrangement is the fact of competing goals: economic development and environmental protection.

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## THE LEVELS OF ENVIRONMENTAL DISCLOSURE BY CHINESE LISTED COMPANIES

In light of the regulatory and institutional framework described, how well have Chinese listed companies complied with environmental disclosure regulation under the Green Securities Policy? Looking at data from 2008 to 2010, we examine both the level of disclosure and the trend over the (admittedly short) length of time the policy has been in effect.

Several Chinese studies have evaluated the levels of environmental disclosure by listed companies in highly polluting industries. Among them, there is a general agreement that environmental disclosure made by listed companies in polluting industries has increased over time, but that it still remains at low levels (Chen & Xue, 2010; Li & Guo, 2011; Wang, Fang, & Xing, 2009). However, most of those studies are limited in scope due to small samples. For example, these studies only focused on certain polluting industries, like petro chemicals and textiles, or a certain year (Chen & Xue, 2010; Hu & Liu, 2011; Li & Guo, 2011; Wang, Fang, & Xing, 2009). Nonetheless, there are two studies that stand out.

Shen and Li's 2010 study included a sample of all companies (502 of them) in highly polluting industries listed on the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE), based on MEP's industrial roster in 2003. The study examined both the quantity and quality of the environmental information reported from 2006 to 2008 as well as industrial differences in disclosure levels. Based on the findings, the quantity of the environmental disclosure made by the sample companies increased but the quality declined from 2006 to 2008. Seventy-five percent of the sample companies reported their environmental information in 2006, 91% in 2007 and 94% in 2008. Interestingly, the environmental disclosure levels found in this study are substantially higher than other studies. A second study of significant scope and depth, completed by Zhong, Zhang and Zhang (2011) for the Chinese Academy of Social Sciences, examined non-financial disclosure by Chinese listed companies. Their research did not specially address listed companies in highly polluting industries, but nevertheless showed a comprehensive picture of overall environmental disclosure in Chinese capital markets. It evaluated the disclosure levels both in annual reports and corporate websites and showed the difference in disclosure levels on the SSE and the SZSE. Their research suggested that the levels of social and environmental disclosure in the two markets were low in general, based upon a scoring method they developed and applied to companies' CSR reports.

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Different from previous studies, the sample selection of this current study uses the criteria and standards based on environmental disclosure regulation under the Green Securities Policy. To that end, this study has taken the following steps:

1. Selection of all the listed companies trading A shares on the SSE and the SZSE.
2. Narrowing the sample to include only listed companies on the two stock exchanges in the 14 highly polluting industries according to MEP's 2008 industrial roster. The 2008 industrial roster was an update to the MEP's 2003 industrial roster used in Shen and Li's (2010) study, and it expanded the number of highly polluting industries from 8 to 14. As a result, the sample sizes for the years 2008, 2009 and 2010 are 539 companies, 552 companies and 626 companies respectively.
3. Downloading the annual reports of all selected companies for the years 2008 to 2010 from the official websites of the SSE (1) and the SZSE (<http://www.szse.cn/>).
4. Collection of data using content analysis of the annual reports. The criteria applied are the seven categories of environmental information prescribed in the SSE's environmental disclosure guidelines (see Table 2). Based on the criteria, the study employed a computerized search of the text of the annual reports. We assign a score of 1 if the text includes any information that falls into any of the seven required categories of environmental information, and a score of 0 if the text does not involve any information related to the seven categories.\*

These methods do have some limitations. First, the sample selection of Step 2 is somewhat

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\* The quality and substance of environmental disclosure by the sample companies is beyond the scope of this study. This study merely probes into whether the sample companies reported any required environmental information. There is much more room for future studies to assess the quality and substance of environmental disclosure by Chinese companies.



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subjective. MEP's 2008 industrial roster included a list of 14 industries with some explanation of manufacturing types, but the names of listed companies in these industries are not readily available (Matisoff & Chan, 2008). Moreover, the SSE and the SZSE employ different industrial classification system. It was partly subject to the authors' discretion as to whether a listed company is a member of the 14 highly polluting industries. Second, annual reports are not necessarily the only method used by listed companies to disclose their environmental information. Due to some ambiguity in the reporting form required under the Green Securities Policy, it is possible that some listed companies would disclose their environmental information in corporate websites, annual environmental reports or other separate reports. This study uses annual reports for several reasons. As the key information source used by listed companies to communicate with their investors and stakeholders, annual reports are the most common reporting form studied in environmental disclosure literature (Neu, Warsame, & Pedwell, 1998). In China, annual reports are mandatory for listed companies, which should disclose both financial and non-financial information, especially information likely to significantly affect investors' decisions, which should include important environmental information (China Securities Regulatory Commission, 2007). In contrast, CSR reports, annual environmental reports, or separate reports are largely voluntary for listed companies prior to the release of the *Guide* in 2010. Third, it is possible that the computerized search employed in this study misses some environmental information in annual reports. It is difficult for this study to read all the text of sample companies' annual reports given the sheer volume of information. Since the annual reports are searchable PDF files, the study instead uses a keyword search using Chinese key words derived from the required seven categories of environmental information. Lastly, there is some degree of discretion regarding whether certain environmental information in the annual reports falls into the required categories.

## **Results**

Figure 2 provides an overview of the total number of listed companies trading A shares in Chinese stocks markets from 2008 to 2011. Overall, listed companies that sell A shares on the markets increased substantially in number during the period of 2008 to 2011, from a total of 1,581 to 2,320, with a striking 46.74% rate of growth. It is easy to see that the spike is mainly attributed to

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the fast growth of listed companies selling A shares on the Shenzhen Stock Exchange (SZSE), which is in contrast to the steady climb of those on the Shanghai Stock Exchange (SSE). The difference could be explained by the large increase of new companies listed on the SME board and particularly the ChiNext board, which started to accept listings in 2009. It indicates the strong capital demand of small and medium Chinese companies, as well as new startup companies once the opportunities afforded by Chinese capital markets became open to them. With regard to the listed companies in highly polluting industries trading A shares in the markets, they grew from 570 to 741 from 2008 to 2011, a 30% rate of growth. With respect to the full range of listed companies trading both A shares and B shares, the listed companies in highly polluting industries selling A shares have maintained a substantial portion, about one-third of the total number of listed companies in the markets, although the ratio has dropped slightly from 35.1% in 2008 to 31.6% in 2011.

**Figure 2: Number of Listed Companies Trading A Shares in Chinese Stock Markets, 2008-2011**

As discussed earlier, SOEs continue to be of great importance in the Chinese markets, and a significant proportion of them are listed as being in highly polluting industries and trading A shares. As Figure 3 shows, the proportion of companies fitting these criteria on SSE has remained steady, around 68%. However, the percentage of such companies listed on the SZSE has dropped from 55% to 37% from 2008 to 2011. On the whole, the proportion of state-controlled listed companies in highly polluting industries trading A shares in the combined markets declined substantially over time, from 63% in 2008 to 50% in 2011. This is due to the large flow of new listings from small and medium companies and new startup companies, most of which are private businesses. Nonetheless, it is not hard to see the overall state dominance in highly polluting industries over the period of 2008 to 2011.

**Figure 3: Ratio of State-controlled Listed Companies Trading A Shares in Highly Polluting Industries**

Figure 4 illustrates the levels of environmental disclosure by the listed companies in highly polluting industries selling A shares during the period of 2008 to 2010. In the first year of the Green

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Securities Policy, 67% of the sample companies whose stock traded on the SSE reported the required environmental information. This number remained consistent in 2009 (there was only a very slight rise). However, in 2010 the ratio of reporting on the SSE dropped slightly to 65.8%. In the case of the SZSE, the rate of required environmental reporting increased from 50% of the sample companies to almost 53% in 2009, and again jumped to 56% in 2010. Combined, the overall environmental reporting rate on the two markets was quite steady, increasing only slightly from 59.4% in 2008 to 60.5% in both 2009 and 2010. In general, the level of environmental disclosure by Chinese listed companies in highly polluting industries trading A shares has increased slightly over time, but it does not appear to have increased significantly since the launch of the Green Securities Policy in 2008.

**Figure 4: Levels of Environmental Disclosure by the Sample Companies, 2008-2010**

Although the results shown here are much lower than Shen and Li's study from 2010, the levels of environmental disclosure found in this study are generally consistent with other previous studies (Li & Guo, 2011; Wang, Fang, & Xing, 2009). Additionally, the levels of environmental disclosure on the SZSE are found to be lower than that on the SSE in this study, which is consistent with Hu and Liu's study (2011). One possible reason for the lower disclosure rates in the SZSE, as suggested by Hu and Liu (2011), could be the launch of environmental disclosure guidelines on the SSE, while there was no similar guidance on the SZSE specifically addressing environmental disclosure. It could also be the result of smaller, newer companies having less knowledge of reporting requirements, and less experience with them, and/or the capacity to collect the necessary information. Additionally, considering the entire market beyond the companies examined, it should be noted that the overall disclosure level can be expected to be lower, since it is generally agreed that polluting industries tend to report more environmental information than other industries in China (Cao, Jiang, & Cao, 2010; Guo, 2005; Li & Guo, 2011).

Lastly, it should be noted that during the analysis of the annual reports, the authors were cognizant of the limitations surrounding environmental disclosure under the Green Securities Policy. Most importantly, the policy is based on self-reporting, in which companies choose what to disclose and how to discuss the information. This approach means that much of the information reported

seemed very limited, while the quality and consistency of different firms' environmental disclosure varied greatly. In addition, many reports include only rhetoric, lack substance and are hard to verify. It also appeared that after relatively higher levels of disclosure in 2008 and 2009 reports, several companies then disclosed much less environmental information for the year 2010. Additionally, environmental information reported by companies listed on the SZSE appeared to be substantially less in quantity and poorer in quality than for companies listed on the SSE. These limitations not only indicate that the full measure of companies' environmental impact is significantly underreported, they also undermine the credibility of reporting.

### **THE DYNAMICS UNDERLYING ENVIRONMENTAL DISCLOSURE BY CHINESE LISTED COMPANIES**

From a Western perspective, the level of disclosure appears to lag behind global leaders. KPMG released a study in 2011 on global corporate responsibility reporting (KPMG, 2011), and it revealed that among the top countries in environmental reporting, the UK and Japan are the two global leaders, with 100% of the UK companies and 99% of the Japanese companies surveyed reporting. By contrast, KPMG found that about 60% of the Chinese companies surveyed issue environmental reporting, which is consistent with the data presented in this analysis.

While this comparison seems to reflect poorly on disclosure in China, the levels of environmental disclosure by listed companies can and should be assessed as part of a larger set of unfolding changes in Chinese politics and society. Considering that China is a country that was considered one of the worlds' poorest a generation ago, the level of reporting, and even more importantly, the development of an increasingly robust legal and regulatory framework to require environmental reporting, is significant. This trend, toward the further development of political institutions and capacity, reflects what has come to be known as ecological modernization. Therefore, examining the issue of environmental disclosure through the lens of Ecological Modernization Theory, the dynamics of political change underlying environmental disclosure by Chinese listed companies can be better understood and appreciated.

Ecological Modernization Theory (EMT) is a theoretical framework that examines the evolution, along with changing business and social practices, in the institutionalization of environmental governance of modern societies (this is sometimes called "ecological institutionalization"). It argues

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that economic development, which presents new environmental challenges, prompts changes in political institutions, market behavior, and social practices to respond to these challenges. Over time, modernizing societies will undergo a growing ecological institutionalization, rooted in a growing ecological awareness, that ultimately reaches a relatively permanent status and promotes sustainable development (Buttel, 2000; Huber 2000; Mol, 2001; Mol, 2006). EMT was originally applied to developed countries, but more recent research has sought to test its applicability in developing countries, such as China, Vietnam and Kenya (Mol, 2001; Li & Lang, 2010; Park, Sarkis, & Wu, 2010; Zhu, Geng, Sarkis, & Lai, 2011). Four key areas of development, which are briefly considered here, include political modernization, economic actors and markets, civil society and the media, and international integration. While the parameters of EMT and its development as theory are hardly settled matters, this analysis seeks to apply the theory as an analytical framework to capture some of the dynamics behind the growing, but also limited environmental disclosure among Chinese listed companies.

## **An Analysis of Ecological Modernization in China through the Lens of EMT**

### ***Political Dynamics***

In the process of ecological institutionalization, the Chinese state is the key actor, and it has greatly transformed from its traditional role. Instead of the conventional top-down hierarchical command-and-control approach, environmental governance has evolved into an increasingly decentralized and flexible mechanism that embraces growing participation of non-state actors and international institutions (Mol, 2001). In today's transitional China, environmental interests have enjoyed a higher priority in the state agenda, as environmental deterioration poses a serious challenge to state effectiveness and legitimacy (Jia & Tomasic, 2009; Lin, 2010; Ma, Webber, & Finlayson, 2009; J. Wu, 2009). The consequent political modernization can be mainly observed in the emerging environmental governance framework that features increasing local autonomy, inclusion of economic, social and international actors, and a fairly sound environmental policy system (Mol, 2006; Shi & Zhang, 2006). For example, the Chinese government has employed some economic instruments to incentivize environmental compliance while punishing violation. Currently, the most widely used tools are environmental fines and discharge fees, putting an economic cost to

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companies' environmental noncompliance, though these measures have had limited impact (Economy, 2006). Other tools, such as SO<sub>2</sub> cap-and-trade and environmental taxes, are under study by Chinese policy makers to force companies to internalize their environmental costs.

With respect to environmental disclosure, the new environmental governance framework has provided a good basis for promoting environmental disclosure of listed companies. It has allowed for increased local autonomy to make local policies and design specific programs that fit local regions, with the aim of improving local companies' environmental disclosure (Guo, 2005). Meanwhile, the policy initiatives in corporate environmental disclosure and CSR in recent years have raised national awareness on the importance of corporate environmental disclosure and responsibilities. In addition, they have encouraged the involvement of investors, creditors, civil society, the media and international actors to push listed companies for more environmental transparency. With regard to all these developments, EMT provides an apt understanding of China's political evolution as it increasingly develops the institutional interest and capacity for environmental awareness and disclosure.

At the same time, this evolution remains a work in progress. Despite the overall positive trend with regard to policy and institutional changes, several problems of governance in the environmental legal framework have impeded the progress of environmental disclosure by listed companies (Economy, 2006). One set of problems involves deficiencies and loopholes in the disclosure regulations under the Green Securities Policy. As mentioned earlier, the laws only include very general and sometimes implied provisions relating to environmental disclosure, and this is unlikely to impose legal requirements or penalties upon listed companies in the event that they provide no environmental disclosure (Guo, 2005; Lin, 2010). Change in law and regulation, with clear and strong provisions that specifically address environmental disclosure by listed companies, would address these weaknesses and ambiguities.

For example, environmental disclosure requirements under the Green Securities Policy can be considered underdeveloped in light of the broad, ambiguous, inconsistent, and "soft" language with little legally binding force among different official documents (Southern Weekend, 2010; Wang, 2011). There are ambiguities and discrepancies in environmental disclosure types (mandatory or voluntary), forms (CSR reports, individual reports, or annual environmental reports), media

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(corporate websites, MEP website, or other), time frames (reporting environmental incidents immediately, within one day or two days after they occur), as well as formats and contents, which can cause confusion and difficulties in actual implementation, or leave too much discretion to listed companies. The “soft” language, rather than strong or firm language, is somewhat a departure from the original purpose of the Green Securities Policy to put mandates on environmental disclosure by Chinese listed companies in highly polluting industries.

Generally speaking, the environmental disclosure requirements are legally weak. As admitted by MEP, the Green Securities Policy was incomplete at its launch in 2008 and needed further collaborative efforts from related agencies for improvement (State Environmental Protection Administration, 2008). However, except for SSE’s environmental disclosure guidelines in 2008, which are only applied to companies traded on the SSE, the update of environmental disclosure regulation under the Green Securities Policy did not materialize until the release of the *Guide* in 2010. The *Guide* has tried to consolidate the previous requirements and offer detailed guidelines to standardize environmental disclosure practices of listed companies. To date, however, it is still considered a draft and has not yet been upgraded to a legally binding document. It is hard to imagine how listed companies can fully commit to environmental disclosure if clear, firm, and legally binding rules are missing in the first place.

The second set of problems in the development of disclosure rules and practices involves the bureaucratic turf battles and multi-agency problems embedded in the environmental governance of listed companies due to their overlaid institutional framework (Economy, 2007; Mol, 2006; F. Wu, 2009; J. Wu, 2009). There are potential conflicts between two competing camps. The agencies governing state-owned assets, led by the State-owned Assets Supervision and Administration Commission (SASAC) of the State Council, and the securities agencies led by China Securities Regulatory Commission (CSRC), focus on economic interests. In contrast, environmental agencies, with the MEP in the forefront, prioritize environmental interests, and have no authority over financial markets. The competition between the two camps is even more complicated when other government agencies connected to the governance of listed companies are also involved (Organisation for Economic Co-operation and Development, 2011; F. Wu, 2009). The organizational structure for governing listed companies (see Figure 1), makes for a complex and sometimes

uncertain process regarding whose interests and authorities will prevail. As a result, the amount of regulatory pressure on listed companies depends on which camp wins and also the nuances of these multifaceted relationships.

As is often the case, economic interests tend to gain the upper hand (Tang & Zhan, 2008; J. Wu, 2009). As pointed out earlier, the listed companies controlled by the state benefit from their connection to agencies with greater power and influence inside the government. This characteristic, which reflects the political structure of the state, has the effect of potentially deterring or diminishing regulatory efforts from environmental and securities agencies lower in the hierarchy (Jia & Tomasic, 2009; Yang & Sanders, 2007).

A good example of this type of clash is the coordination problem between MEP and CSRC, which has been a major barrier to the development of environmental disclosure. In the interface of environmental and financial policy, the Green Securities Policy requires the close cooperation of MEP and CSRC in order to be successful. In fact, the MEP and CSRC have not been effective in coordinating and harmonizing decision-making regarding the Green Securities Policy in terms of rule development, implementation and communication (Cao, Jiang, & Cao, 2010; Ji, 2009). While the MEP and CSRC have collaborated in other areas, such as the Green IPO policy, environmental disclosure by listed companies has been largely a unilateral effort by MEP since its release (Lv, 2012). Both the policy statement of Green Securities Policy and the *Guide* were issued by MEP. CSRC, on the other hand, has not released any specific guidance or regulation that addresses environmental disclosure by listed companies. In addition, because CSRC is understood to have greater clout in the informal hierarchy of state governance, and because it plays the role of rulemaker in Chinese capital markets, it is reasonable to expect something less than the full attention of listed companies to environmental disclosure without the strong participation and support of CSRC. Moreover, there are no established rules or guidance regarding how MEP and CSRC will divide their roles and responsibilities, monitor environmental reporting, or sanction violations in the enforcement and implementation of environmental disclosure by listed companies. In particular, MEP and CSRC have not resolved the problem of how to share environmental information in their separate systems (Cao, Jiang, & Cao, 2010; Ji, 2009). Whereas CSRC and the stock exchanges enjoy exclusive authority to review listed companies' annual reports (a place where some environmental disclosure is expected



to be included), the MEP and local environmental agencies hold the environmental records – particularly environmental violations – of Chinese companies through their regular environmental monitoring.

Environmental governance in China must also take into account the understanding that even though environmental laws, regulations and policies may be enacted at the national level, the central government cannot always have them broadly implemented and enforced at the local level. Local agencies have their own agendas and priorities that are not necessarily in line with that of corresponding national agencies (Economy, 2006; Ewing, 2005; Ma, Webber, & Finlayson, 2009; J. Wu, 2009). Whereas national agencies like MEP have increasingly aligned themselves with environmental interests, leading to more stringent environmental regulations, local government agencies have often been more limited in their environmental pursuits due to the dominant economic interests in local areas (Tang & Zhan, 2008; Wang, et al., 2004; J. Wu, 2009). In this regard, the role of local governments in the environmental governance of local listed companies should not be underestimated. As mentioned before, local governments do exert significant influence through the supervision of local EPBs and SASACs. Moreover, the relationships between local governments and listed companies have complicated the governance of listed companies. Large employers are often regarded as local champions, with significant contributions to local employment and tax revenues. Additionally, many listed companies are directly funded by local governments, or their executive leaders have strong personal connections with local governments (Ewing, 2005; Tang & Zhan, 2008). For instance, Zijin Mining's operations in Fujian Province contributed, on its own, roughly 70% of the tax revenue Shanghang County received in 2010 (Zhou, 2010). On top of this, the Shanghang County SASAC, which oversees Zijin Mining, owns 29% of Zijin's shares, while the Chairman and another member of Zijin's Supervisory Board formerly served in the Shangdang County government (Zijin Mining Group Company Limited, 2011). Hence, in many cases, the environmental transparency of listed companies hinges upon how local governments and listed companies weigh environmental disclosure against economic gains. Ultimately it is the local governments' protection of listed companies that presents a big hurdle to environmental disclosure by listed companies (People's Daily Online, 2011; Wang, et al., 2004).

Among the agencies involved in environmental governance of listed companies, local

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environmental agencies are at a particular disadvantage. They are widely known for their insufficient institutional capacities and weak powers that in turn lead to poor implementation of environmental regulations (Mol, He, & Zhang, 2011; Shi & Zhang, 2006; Tang & Zhan, 2008; J. Wu, 2009). Due to insufficient funding from local budgets, local environmental agencies are often understaffed and equipped with poor facilities, resulting in insufficient professional capabilities and the lack of effective programs to monitor environmental performances of local companies (Mol, He, & Zhang, 2011; Shi & Zhang, 2006). Besides, compared to other agencies within local governments, local environmental agencies have weak voices (Shi & Zhang, 2006; J. Wu, 2009). Therefore, the success in enforcement of environmental regulations depends on whether local environmental agencies can successfully negotiate within local governments as well as their inherent institutional capacity. Environmental disclosure by listed companies is especially challenging for local environmental agencies. It requires their discretion to interpret the ambiguous rules and enforce them. It also requires close monitoring of environmental performance of local listed companies. As to what extent local listed companies eventually disclose, it depends upon the local environmental agencies' dynamics with local governments and other involved agencies.

### ***Economic Actors and Market Dynamics***

According to Ecological Modernization Theory, economic actors, such as producers, clients, consumers, financial institutions and business communities are increasingly involved as social agents of ecological restructuring and reforms. This trend is complementary to the development of governmental capacity, as economic rules and tools are used to achieve environmental goals, transforming state-market relations in environmental institutionalization (Mol, 2001; Economy, 2006; Shi & Zhang, 2006).

Recent years have seen a growing number of voluntary green initiatives, indicating the receptiveness to environmental interests. Good examples include the social responsibility indices launched by the two stock exchanges, as mentioned before, and the Environmental Protection Index released by the Tianjin Economic-Technological Development Area (TEDA) in 2008, the first of its kind in China that captures the stock prices of leading listed companies in green industries (Shenzhen Securities Information Co., Ltd, 2011). In addition to voluntary initiatives in the markets, the Chinese

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government has employed economic instruments to incentivize environmental compliance while punishing violation (Economy, 2006). As pointed out above, the most widely used tools are environmental fines and discharge fees, with environmental taxes and an SO<sub>2</sub> cap-and-trade system under study.

Still, rising environmental interests have yet to turn into mainstream practices, as economic interests still dominate. With regard to environmental disclosure by listed companies, financial stakeholders, mainly investors and credit institutions, are the key economic actors who could add significant pressure on listed companies and push them for environmental disclosure (Neu, Warsame, & Pedwell, 1998). Presently investors and credit institutions still tend to attach more importance to financial returns of listed companies while neglecting the corresponding environmental risk. With regard to economic tools used by the government, their impacts seem limited, and environmental fines and discharge fees are considered too low to effectively deter companies' environmental noncompliance (J. Wu, 2009). For example, the fine paid by Zijin Mining for its toxic spill, 9.5 million RMB, was recorded as the largest environmental penalty since the founding of China. However, it was merely 0.27% of Zijin Mining's profit in 2009 (Zhou, 2010). In fact, China's low environmental penalties have been under frequent criticisms for inducing Chinese companies to take risks in environmental violation, rather than to pay much higher costs for going green (J. Wu, 2009). The result is that only a small portion of Chinese companies' environmental externalities are translated into their economic costs, making it easier for listed companies to avoid factoring environmental risk into the decision making of their financial stakeholders.

In recent years, Chinese banks have increased their own environmental disclosure and they have formed their environmental policies relating to project financing since the launch of the Green Credit Policy in 2007 that prohibited banks from lending to companies announced by MEP as environmental violators (Matisoff & Chan, 2008). However, there are still many instances of Chinese banks financing environmentally-sensitive projects both domestically and abroad (X. Yu, 2011). For instance, several large Chinese banks, including The Export-Import Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, China Merchant Bank and Industrial and Commercial Bank of China, gave loans to Zijin despite its poor environmental record (X. Yu, 2011).

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EMT posits that environmental interests and movements will increasingly participate in the decision-making processes of the state and market, and indeed, China's ecological institutionalization has seen a rise in public participation in environmental governance (Mol, 2006; Shi & Zhang, 2006; F. Wu, 2009). It is attributed to the mounting public concerns over environmental quality, as environmental deterioration has threatened public health. The rising cases of environmental complaints and protests made by the public in recent years are good examples to indicate how Chinese citizenry are involved in environmental governance and strive for environmental rights (Lin, 2010).

An important indicator is the rapid growth of Chinese home-grown environmental non-governmental organizations (NGOs), both in their number and influence in China's environmental governance. Since the founding of the first NGO in 1991, the number of Chinese NGOs in mainland China reached the number of around 3,300 by October 2008 (All-China Environment Federation, 2008). The rise in the number of NGOs is related to the current tide of China's political landscape, where environmental issues are assigned lower political sensitivity as compared to issues such as democracy and human rights. Hence, the Chinese government is more tolerant toward Chinese NGOs' environmental activities. Moreover, the central government tends to give some leeway to NGOs, which places additional pressure upon local governments (Lin, 2010; Ma, Webber, & Finlayson, 2009; J. Wu, 2009; G. Yang, 2005).

At present, the main role of Chinese NGOs is to educate the public so as to raise environmental awareness and engage people in environmental protection and governance through environmental campaigns, trainings, volunteering, and other events (All-China Environment Federation, 2008; G. Yang, 2005). One of the more successful examples is the Institute of Public and Environmental Affairs (IPE), which publishes a map of air and water pollution in China, along with a database of thousands of factories with air and water violations. IPE's work has prompted hundreds of companies, including large multinational corporations like Walmart and Nike, to audit their suppliers' practices and take corrective actions (IPE, n.d.; Goldman Environmental Prize, 2012).

In recent years, many Chinese NGOs have become increasingly involved in activities of a political nature. They monitor government implementation of environmental regulations, track corporate environmental performances, and mobilize resources to deal with governmental inactions and corporate environmental violations (Tang & Zhan, 2008; All-China Environment Federation,

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2008). In one instance in 2011, a scandal drew national attention involving the Harbin Pharmaceutical Group Holding Co., Ltd (Economic Information Daily, 2011). After a China Central Television report revealed that the company had been emitted waste gases and water beyond legal limits, four Chinese ENGOs investigated the company and found further violations. As early as 2009, Harbin Pharmaceutical was named by the local environmental agency as a heavy polluter, but it did not disclose any related environmental information subject to SSE's environmental disclosure guidelines. The ENGOs wrote an open letter to MEP and SSE and push them to punish Harbin Pharmaceutical and suspend its market refinancing, based on Green IPO and environmental disclosure regulation under the Green Securities Policy.

Similar to the evolution of market actors, Chinese ENGOs face political and financial barriers. First, they face challenges in their legal status due to the strict official requirements for NGO registration (Tang & Zhan, 2008; G. Yang, 2005). Based on a study of Chinese ENGO All-China Environmental Federation in 2008, 7.2% of the 465 Chinese NGOs surveyed were unregistered. Second, as an organizational strategy, Chinese ENGOs generally take a non-confrontational position against the Chinese government. They strive to pursue their organizational environmental agendas within certain political boundaries, which limit their activities in politically-sensitive yet crucial environmental issues. For instance, Chinese ENGOs potentially face conflict with local governments if they try to raise issues against local polluting companies who may be vital to local economies (Tang & Zhan, 2008; Lin 2010). Third, because of the lack of a strong and environmentally aware middle class in China to support Chinese ENGOs, they often face funding shortages. This funding problem has been echoed by Chinese ENGOs as the biggest hurdle to their growth (All-China Environment Federation, 2008; Tang & Zhan, 2008).

The increasing public participation is also accompanied by the active role of Chinese media in environmental governance. Although it is still controlled by the government, Chinese media has gained greater independence with media commercialization in the late 1980s (this is especially true for the Internet). For Chinese ENGOs, the media has offered an increasingly cost-effective and efficient avenue to quickly disseminate environmental information, conduct environmental advocacy, and draw public attention to critical environmental issues (Shi & Zhang, 2006; All-China Environment Federation, 2008). For Chinese citizens, the Internet provides an inexpensive and convenient place to express environmental concerns and discuss environmental issues. Studies

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indicate public opinion expressed on the Internet, such as online forums, postings and blogs, have pushed Chinese government to address more environmental complaints (Ma, Webber, & Finlayson, 2009).

Meanwhile, Chinese media itself has become a vital actor in China's environmental governance (G. Yang, 2005). It has stood out in the reporting of key environmental issues and holding polluting companies and regulators accountable (Ma, Webber, & Finlayson, 2009). Major environmental accidents like Zijin Mining and Harbin Pharmaceutical's pollutions were extensively covered and discussed in Chinese media, creating mounting pressures on environmental violators and regulators.

### ***International Integration***

In ecological modernization, international institutions and organizations have an increasing role in influencing environmental reforms and institutionalization at the national level. To some degree, they undermine the traditional role of the nation-state (Mol, 2006). China's expanding integration into the world has been reshaping its institutional, economic and social landscapes. With respect to the environment, China has quickened its steps in catching up with outside environmental standards, and also with adopting "greener" practices seen elsewhere in the world (Mol, 2006).

The establishment of China's environmental policy system has indeed been influenced by international environmental movements and organizations, in the form of cooperation and consultation with outside organizations to help configure institutions and design policies (F. Wu, 2009). Some new environmental programs have co-developed by the Chinese government and its international partners, who provide funding and technical assistance. For example, since the 1990's, the Chinese government has collaborated with the World Bank, the Organization for Economic Co-operation and Development, the Asian Development Bank, the United Nations Environment Programme and the United States Environmental Protection Agency on the development of its environmental policies (State Environmental Protection Administration, 2007b). Another example is the China-US Center for Sustainable Development, which is a public-private partnership between China's Ministry of Science and Technology and a US consortium of NGOs and businesses to develop policies and programs addressing China's sustainable development issues (Economy, 2006).

With regard to civil society, the fast growth of Chinese ENGOs has greatly benefited from a large amount of financial and non-financial assistance from their international counterparts in terms of

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funding, program development, technical assistance and staffing (All-China Environment Federation, 2008; Tang & Zhan, 2008; F. Wu, 2009; G. Yang, 2005). Recent years have seen an increase in the number and scope of joint programs between Chinese ENGOs and international NGOs, allowing for an increase in the resources available to Chinese ENGOs and the capacity to increase environmental activism (All-China Environment Federation, 2008; F. Wu, 2009; G. Yang, 2005). A good example is the *Pollution Information Transparency Index* (PITI) co-released by the Chinese ENGO, Institute of Public & Environmental Affairs (IPE), and the US-based ENGO, Natural Resources Defense Council (NRDC). The PITI selects 113 Chinese cities and ranks them based on levels of environmental disclosure. Since 2009, it is carried out annually with the results reported to government partners (Natural Resources Defense Council, n.d). Consequently, by the end of 2011, 548 companies had responded to PITI's criticism of their environmental records and began environmental improvements (Institute of Public and Environmental Affairs & Natural Resources Defense Council, 2011)

In the market domain, many Chinese companies now are competing in the global market where they face more stringent environmental regulations and stronger environmental demands from international investors, clients and consumers (Economy, 2006; Shi & Zhang, 2006). This has prompted companies to achieve accreditation by international green standards, and to employ green practices. A good example is the voluntary compliance of Chinese companies, including many listed companies, on the popular international codes of social and environmental disclosure, such as the Global Reporting Initiative, the United Nations Global Compact, and ISO 26000 (BSR, 2009; Zhong, Zhang, & Zhang, 2011). Additionally, as foreign direct investments increase in the Chinese market, many large multinational corporations have been environmental front-runners, taking the lead in setting higher green standards, disseminating environmental knowledge, transferring green technologies and management practices (Economy, 2006).

China's global integration has not yet been a force able to fundamentally transform its institutional, social and market domains. The Chinese government remains cautious about political implications associated with international influences and has made an effort to limit their scope and influence (Mol, 2006). With regard to international NGOs, the government has blocked their involvement in politically-sensitive areas in China, which in turn has limited their influence upon environmental governance in China (Tang & Zhan, 2008). In the market, only Chinese companies competing globally have strong incentives to improve their environmental performance in order to

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gain greater acceptance in the global market. With respect to multinational corporations in China, their influence has not been strong enough to stimulate widespread adoption of green practices among Chinese domestic companies. At the same time, some large multinational corporations have had poor environmental records in China in recent years (Friends of Nature, Institute of Public and Environmental Affairs & Green Beagle, 2010).

## **CONCLUSION**

In recent years, mounting environmental pressures have prompted the Chinese government to resort to new green laws and regulations. One of these new measures is the environmental disclosure regulation under the Green Securities Policy. To the extent that the aim of the policy is to achieve more environmental reporting and disclosure by the listed companies in 14 highly polluting industries, then the policy is demonstrating a degree of effectiveness, even if it has limitations. Despite a modest increase over time, the level of environmental disclosure has remained similar over the few years the regulation has been in effect, with 59% of the sample companies reporting in 2008 and almost 61% in 2010.

Rather than judging these results as a success or failure, this study is more interested in considering the dynamics surrounding environmental disclosure by Chinese listed companies through the lens of Ecological Modernization Theory. It finds that China's experience does indeed correspond to the expectations of EMT, undergoing a process of ecological modernization that is creating a political, business and social environment increasingly receptive to addressing environmental issues, including environmental disclosure by listed companies.

In terms of political modernization, deficiencies in the environmental legal framework, along with bureaucratic conflict and multi-agency problems in environmental governance, have impeded the progress of environmental disclosure. Most significantly, there are coordination problems between the MEP and the China Securities Regulatory Commission (CSRC), which reflect the competing priorities of economic development and environmental interests. As noted above, the economic interests generally take precedence. A second impediment is that this same political dynamic is repeated at the local level, in which the economic interests of local governments tend to dominate when they conflict with environmental regulation. With regard to economic actors and



market dynamics, financial stakeholders still focus more on listed companies' financial returns while comparatively neglecting their environmental risk. Moreover, economic tools utilized by Chinese government are limited in number and effect, especially the low environmental penalties. In terms of civil society, Chinese environmental NGOs and media have an increasingly important role in contributing to China's environmental governance. Even still, both of these entities face political boundaries and realities that have limited their effectiveness with respect to environmental advocacy. Lastly, regarding international integration, the development of China's green policies, along with the growth of Chinese environmental NGOs, and the ability of Chinese companies to address their environmental records have all benefited from international influences, relationships, connections and norms. At the same time, the influence of international actors has yet to fundamentally change China's political landscapes with respect to environmental disclosure.

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**TABLES AND FIGURES**
**Table 1: Environmental Disclosure Requirements under the Green Securities Policy**

Official Documents	Mandatory Provisions	Voluntary Provisions	Reporting Form & Media
Policy Statement of Green Securities Policy	Listed companies should immediately report important environmental issues likely to have big influences on their stock prices.	Listed companies are encouraged to voluntarily disclose other environmental information on a regular basis.	No specific requirements
SSE Environmental Disclosure Guidelines	<p>Listed companies traded on the SSE should disclose important environmental issues likely to have big influences on their stock prices within two days after issues occur.</p> <p>Listed companies in highly polluting industries traded on the SSE should disclose 7 categories of environmental information showed in Table 2.</p> <p>Listed companies traded on the SSE named as heavy polluters should disclose required environmental information within two days after environmental agencies announce their names.</p>	Based on their needs, listed companies traded on the SSE in general can choose to disclose 7 categories of required information or other voluntary environmental information.	Mandatory environmental information should be disclosed in annual CSR reports or separate reports and available to the public through the media designated by the China Securities Regulatory Commission. Voluntary environmental information can be made public in corporate websites.
<i>A Guide on Listed Companies Environmental Information Disclosure (Draft)</i>	Listed companies in highly polluting industries should regularly disclose their environmental information in annual environmental reports. The report should include 8 categories mandatory environmental information. Companies should publish provisional environmental reports within one day after any environmental emergency occurs.	Listed companies in other industries are encouraged to disclose their environmental information based on the <i>Guide</i> .	Annual environmental reports should be published in corporate websites and the MEP's website. Provisional environmental reports should be published in <i>China Environmental News</i> in addition to the two venues.

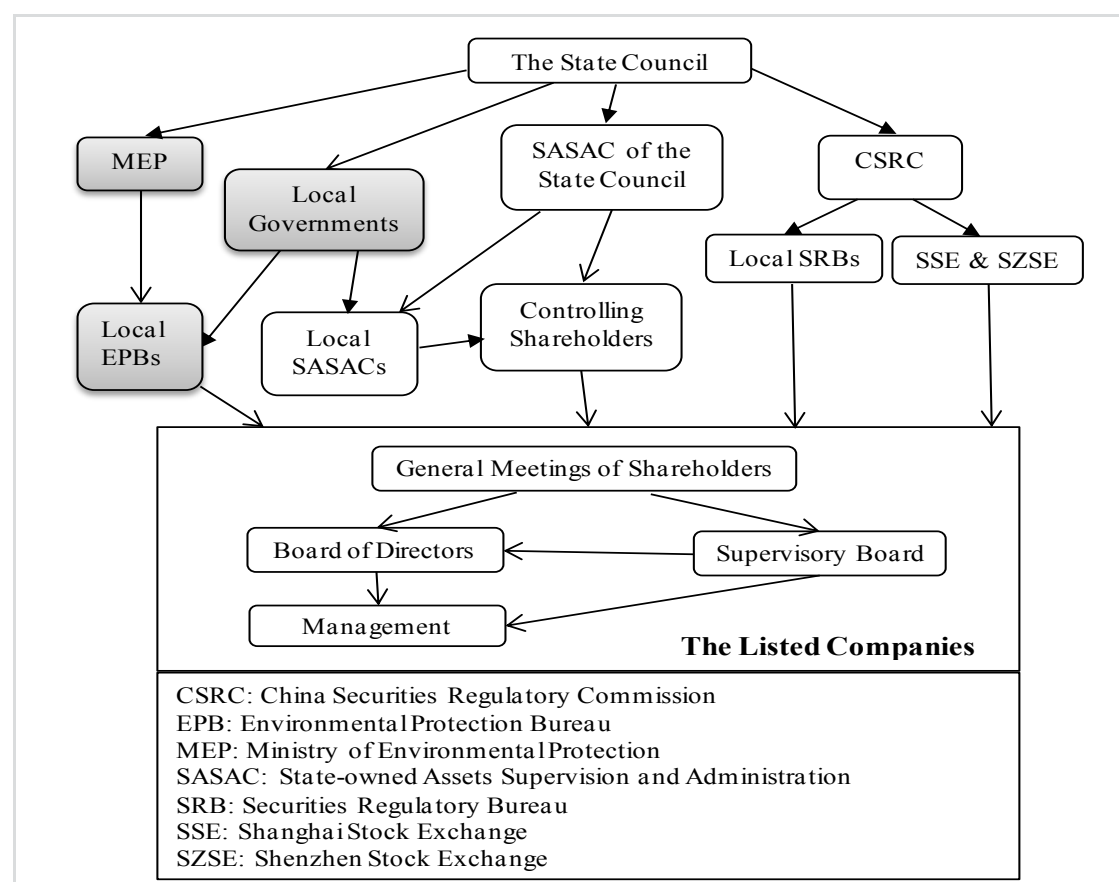
Sources: Ministry of Environmental Protection, 2010; Shanghai Stock Exchange, 2008; State Environmental Protection Administration, 2008.

**Table 2: Environmental Information Required in SSE's Environmental Disclosure Guidelines**

No.	Environmental information items
1	Corporate environmental principles, annual environmental goals and performance.
2	Annual total resource consumption.
3	Environmental investments and environmental technology development.
4	Types, quantities, concentrations and disposals of pollutants.
5	Environmental facilities and their operations.
6	Disposal and treatment of wastes generated in production, and recycling and comprehensive use of used products.
7	Voluntary agreements with environmental agencies on improving corporate environmental performance.

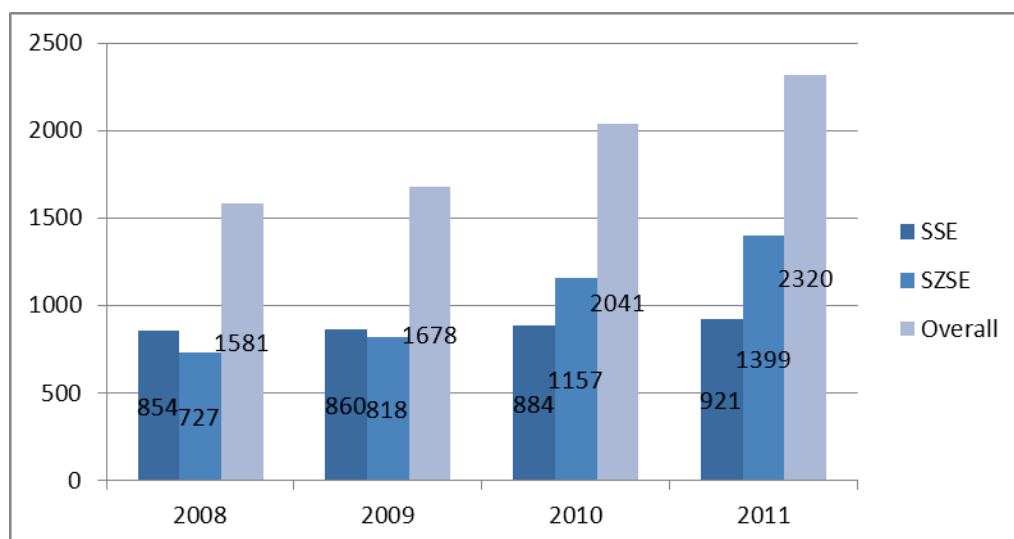
Source: Shanghai Stock Exchange, 2008.

**Figure 1: The Institutional Governance Framework for Chinese Listed Companies**



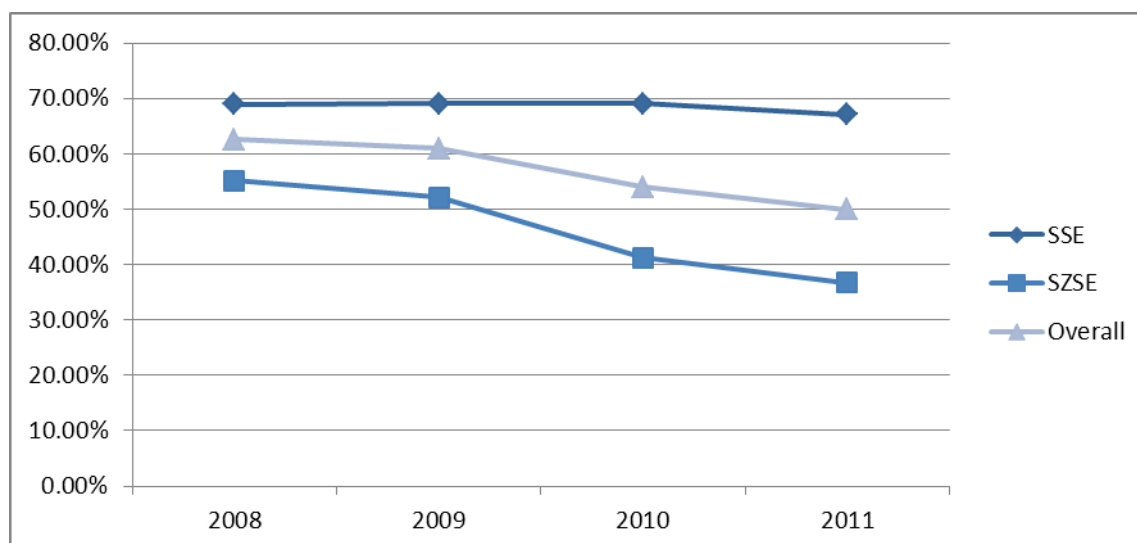
Sources: Organisation for Economic Co-operation and Development, 2011; Jia & Tomasic, 2009.

**Figure 2: Number of Listed Companies Trading A Shares in Chinese Stock Markets, 2008-2011**

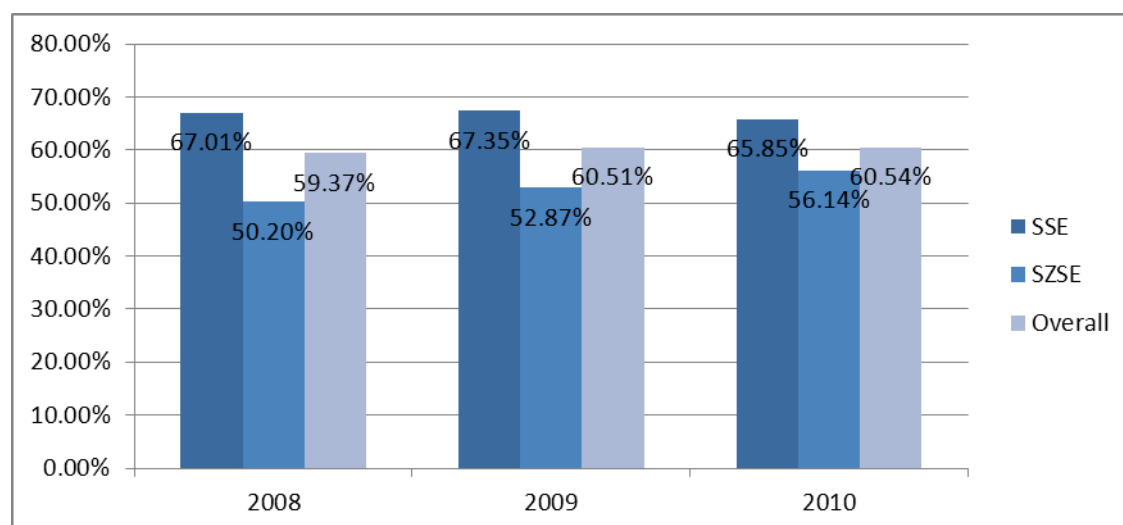


Sources: The data is calculated by the authors based on the Shanghai Stock Exchange, 2011; Shenzhen Stock Exchange, 2011b.

**Figure 3: Ratio of State-controlled Listed Companies in Highly Polluting Industries (A Shares)**



Sources: The data is calculated by the authors based on the Shanghai Stock Exchange, 2011; Shenzhen Stock Exchange, 2011b.

**Figure 4: Levels of Environmental Disclosure of Sample Companies, 2008-2010**

Sources: The data were collected and compiled by the authors.