Assessing the Green Securities Policy in China: An Examination of Environmental Disclosure by Chinese Listed Companies in Highly Polluting Industries

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In 2008, China released a new green initiative, the Green Securities Policy, to increase the sustainability of Chinese capital markets. One of the integral components of the policy is the new environmental disclosure regulation which prescribes Chinese listed companies in the 14 highly polluting industries to report required environmental information. This research seeks to explore the regulation from two dimensions. First, the research evaluates the levels of environmental disclosure by Chinese listed companies regulated under the Green Securities Policy from the years 2008 to 2010. The findings suggest that the levels of environmental disclosure by the sample companies increased but remained low from 2008 to 2010. 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 a positive environment for environmental disclosure regulation in general, the research highlights the current problems in China’s political, social and market arena that have impeded the progress of environmental disclosure by Chinese listed companies.
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INTRODUCTION

In July 2010, China’s largest gold producer traded on the Shanghai Stock Exchange, Zijin Mining Group Co., Ltd, made a notorious toxic spill that caused a stir both domestically and internationally. 2.4 million gallons spilled from its mine in Fujian Province, Southeast China, polluting a large local waterway, and killing 2000 metric tons of fish. This caused a direct economic loss of $4.8 million in the local area (Natural Resources Defense Council, n.d.b; Xiao, 2010). However, the spill was covered up for 9 days prior to its disclosure to the public. The question is, with environmental disclosure regulation of Chinese listed companies in place, why did Zijin not immediately report its spill as required? Zijin’s case prompted this current study on environmental disclosure by Chinese listed companies.

In recent years, China has made a number of green policy initiatives to deal with its rising environmental challenges to strive for the best interest of its growth forward. In 2008, China released the Green Securities Policy with a goal of controlling financial risks and curbing the expansion of Chinese listed companies in the 14 highly polluting industries, including “thermal power, steel and iron, cement, aluminum, coal, metallurgy, building materials, mining, chemicals, oil, pharmaceuticals, light industry, and textiles and leather” (Matisoff & Chan, 2008, p. 8). The new environmental disclosure regulation is a vital component of the Green Securities Policy, prescribing a range of environmental information that should be reported by Chinese listed companies in the 14 highly polluting industries.
This current study has two central goals. The first goal is to evaluate the levels of environmental disclosure by the listed companies in highly polluting industries regulated under the Green Securities Policy from the years of 2008 to 2010. Due to the ambiguous and inconsistent official requirements, the 7 categories of environmental information prescribed in the Shanghai Stock Exchange’s 2008 environmental disclosure guidelines, involving environmental policies, facilities, managing practices and disposal of pollutants and wastes, are adopted as the criteria of environmental disclosure in this study. Thus, this study looks at how many of those listed companies disclosed any required environmental information in their annual reports for the years of 2008 to 2010.

The second goal of the current study is to capture the dynamics underlying environmental disclosure by listed companies using the lens of Ecological Modernization Theory. The theory is a new but influential environmental social framework that examines the institutional developments and social practices of modern societies undergoing ecological institutionalization. The theoretical analysis seeks to understand the dynamics embedded in China’s ecological modernization in four dimensions, political modernization, economic actors and market dynamics, civil society and the media, and international integration. It highlights that whereas it generally has a positive impact, China’s current process of ecological modernization has boasted a number of problems which have constrained the success of environmental disclosure regulation by listed companies under the Green Securities Policy.
This study is an attempt to fill the gap in the scholarship of both corporate environmental disclosure and Ecological Modernization Theory. So far, there is very little English literature examining environmental disclosure by Chinese listed companies. Despite a large number of Chinese studies on the topic, the majority of them are limited in their sampling and scope. In addition, few studies have looked at the topic against the context of the nascent Green Securities Policy. This current study is an initial effort on exploring the environmental disclosure regulation under the Green Securities Policy. It selects a sample including all the listed companies in the 14 highly polluting industries, i.e. 539 companies for 2008, 552 for 2009 and 626 for 2010. In regard to Ecological Modernization Theory, its relevance to developing countries and its applicability to specific environmental regulations are the new research agendas. In this regard, this study is an exploratory effort on testing the analytical utility of Ecological Modernization Theory in examining a specific environmental regulation in China.

The rest of the current study is organized as follows. In SECTION 2, the literature review gives an overview of international corporate environmental disclosure, and corporate environmental disclosure in developing countries as well as in China. In SECTION 3, a brief review of China’s environmental policy system, capital markets and governance of listed companies is made to help readers gain an understanding of the background of environmental disclosure regulation under the Green Securities Policy. In SECTION 4, a theoretical analysis
of environmental disclosure by Chinese listed companies is conducted to understand the underlying dynamics based on the perspectives and structures of Ecological Modernization Theory. The study then concludes with policy recommendations and suggestions for future research.

LITERATURE REVIEW

Corporate environmental disclosure is “the set of information items 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, p. 2). In an international scope, it has been a salient issue widely concerned by companies, national governments, international institutions, academics and civil society for more than two decades, accompanying the growing value of people’s right-to-know (Kraft, Stephan, & Abel, 2011). In the market, companies have taken initiatives to voluntarily disclose their environmental records and build their green credentials. International institutions have developed a number of voluntary-based international codes which aim to encourage wide adoption of corporate environmental disclosure and standardize the global practices. Among the international codes, the most popular one is the Global Reporting Initiative, a sustainable reporting framework that offers guidelines and standard formats for economic, environmental and social disclosure. Its environmental disclosure requirements cover a range of environmental themes, including materials, energy, water, biodiversity,
emissions, effluents and waste, products and services, compliance and transport 
(Global Reporting Initiative, pp. 27-29). Additionally, national governments have 
adopted diverse mandatory environmental disclosure programs to enhance their 
environmental governance after conventional command-and-control measures 
failed to deliver promises (Wang, et al., 2004). Environmental disclosure has 
been tapped as a tool to push companies into disclosing their environmental 
information by placing them under multifaceted pressures from policies, 
markets and civil society (Rothenberg & Stanley, 2004).

Despite the enthusiasm in global practices, corporate environmental 
disclosure is still an issue in debate among academics in terms of its theoretical 
explanations, determining factors and actual effects. Many theoretical efforts 
have been made to uncover the rationale behind companies’ decisions on 
environmental disclosure. From an economic perspective, environmental 
disclosure could be boiled down to companies’ calculations of the potential costs 
and benefits related to the disclosure of their environmental information 
(Cormier & Magnan, 1999; Lee & Hutchison, 2005). In contrast, from social and 
political perspectives, environmental disclosure is interpreted as a result of 
companies’ relations with policies, and markets and civil society, though 
different social-political theories have different emphases on what is the key 
factor influencing environmental disclosure (Lee & Hutchison, 2005; Neu, 
Warsame, & Pedwell, 1998). For example, as a much discussed social-political 
framework, legitimacy theory conceptualizes environmental disclosure as a tool
for companies to legitimize their environmental management and business operations, and avoid legal, social and political sanctions, especially in the time of critical issues like environmental accidents (Anbumozhi, Chotichanathawong, & Murugesh, 2011; Berthelot, Cormier, & Magnan, 2003). Despite the absence of a comprehensive framework, these theories do offer insights on the logic and dynamics behind companies’ decisions on their environmental disclosure.

A number of empirical studies have employed quantitative tools to explore corporate environmental disclosure. Early studies in the 1990s showed interest in the quantity and quality of environmental disclosure and reached differing conclusions with widely varying samples of company numbers, industries, years and countries (Deegan & Gordon, 1996; Lodhia, 2004). In addition, studies have tried to identify the factors that affect companies’ environmental disclosure based on theories and test their statistical significances. The findings have suggested the significance of a group of internal factors, such as company size, industries, financial performance and ownership structure, etc., and a group of external factors, i.e. financial stakeholders and regulators (Barth, McNichols, & Wilson, 1997; Berthelot, Cormier, & Magnan, 2003; Cormier & Magnan, 1999; Lee & Hutchison, 2005; Neu, Warsame, & Pedwell, 1998). Among them, financial stakeholders and regulatory pressures have been highlighted as the key factors that drive companies towards more environmental disclosure (Cormier & Magnan, 1999; Lee & Hutchison, 2005; Neu, Warsame, & Pedwell, 1998; Walden & Schwartz, 1997).
Additionally, scholarly interests have gauged the reliability of environmental disclosure and the relation between environmental disclosure and the actual environmental or financial performance. Generally, the reliability of environmental disclosure is open to question. The information disclosed has been found to be selective, i.e., mostly positive, biased, and subject to managers’ discretions (Berthelot, Cormier, & Magnan, 2003; Neu, Warsame, & Pedwell, 1998). The nexus between environmental disclosure and environmental or financial performance has showed mixed results. In terms of environmental disclosure and environmental performance, the majority of studies concluded no significant relation between the two (Clarkson, Li, Richardson, & Vasvari, 2008; Patten, 2002). However, a recent study by Clarkson, Li, Richardson and Vasvari (2008) indicated a positive relation and attributed previous findings to a mismatch of using voluntary environmental disclosure theories to test against actual mandatory environmental disclosure. In regard to environmental disclosure and financial performance, studies have suggested competing results about their relation, showing no relation, a positive or negative relation (Al-Tuwajri, Christensen, & Hughes II, 2004). Al-Tuwajri, Christensen and Hughes (2004) used an integrated econometric model to jointly test the interrelations of environmental disclosure, environmental performance and financial performance, and found out that positive environmental performance is significantly associated with positive financial performance and more environmental disclosure.
While the majority of the literature focuses on the developed world, recent scholarly interests have been drawn to the developing world where corporate environmental disclosure is still a nascent policy employed by a handful of developing countries. Although the literature on the developing world has echoed the themes of that on the developed world, a unique inquiry in this body of literature is whether corporate environmental disclosure could fit in developing countries, particularly in light of their weak institutions (Anbumozhi, Chotichanathawong, & Murugesh, 2011; Blackman, 2008). Despite competing views on the inquiry, 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). Notwithstanding a few successful cases, a consensus in 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 in China's corporate environmental disclosure, most of which is written in Chinese language, started in early 21st Century and has flourished since 2007, as the country has increasingly adopted green initiatives to combat its environmental challenges. Basically, this body of literature builds upon theoretical and methodological foundations of the international environmental
disclosure literature. A large portion of the literature on China include exploratory studies discussing how to build China’s environmental disclosure system in terms of a legal framework, institutional capacity, market incentives and public participation (Cao, Jiang, & Cao, 2010; Ji, 2009; Zhong & Luo, 2011). A number of empirical studies have assessed the levels, quality and attributes of the environmental information disclosed by Chinese companies. The findings have showed some general patterns. First, environmental disclosure is increasing over time, yet with low levels, inconsistent quality and widely varying contents that are hard to compare. Secondly, most of the information is partial and positive rhetoric lacking in substance. Lastly, some evidence indicates industrial differences in the levels of environmental disclosure with polluting industries disclosing more (Hu & Liu, 2011; Li & Guo, 2011; Shen & Li, 2010; Wang, Fang, & Xing, 2009).

In regard to the factors influencing Chinese companies’ environmental disclosure, empirical studies have reached very different conclusions. Company size is the only factor agreed upon in the literature to have a statistically positive relation with the disclosure levels (Xin & Wang, 2009; Zhong, Zhang, & Zhang, 2011). Chinese companies’ 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). Besides, very few studies have looked at the relation
between environmental disclosure, environmental performance or financial performance. Based on the 2008-2009 environmental disclosure by 445 sampled companies listed on Shanghai Stock Exchange, the study of Yu, Jian and He (2011) demonstrated a positive impact of the sample companies’ environmental disclosure on their economic performance.

To sum up, as a vital policy tool in today's international environmental governance, corporate environmental disclosure needs further research efforts to show a clearer picture of its working mechanisms, determining factors and actual effects on the environmental and financial performances of the corporate world. Albeit a debated issue in academics, environmental disclosure has been proven to be effective in the best practices with a caveat that the related programs need to be carefully designed and enforced (Blackman, 2008). Nevertheless, the nature of corporate environmental disclosure should be fully understood. No matter whether mandatory or voluntary, environmental disclosure relies on external stakeholders to hold companies accountable and it is still subject to managers’ discretions with the possibility of falling prey to green washing (Rothenberg & Stanley, 2004, p. 104). Therefore, as highlighted by Kraft, Stephan and Abel (2011, p. 7), corporate environmental disclosure alone cannot create miracles but it could be a vital part in an integrated approach to environmental governance.

A CONTEXT: CHINA’S ENVIRONMENTAL POLICIES, CAPITAL MARKETS AND LISTED COMPANIES
A Roadmap of China’s Environmental Policies

Although fraught with rising environmental challenges, China has arguably built a fairly sound environmental policy system with its institutional efforts since its founding in 1949. The general trend over the years has indicated the growing importance of environmental issues in the state agenda, advances in an environmental legal framework, 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, the rising of environmental pollution due to the massive development of heavy industries and the international environmental movements, particularly the 1972 United Conference on the Human Environment which China participated, drew the state’s attention to environmental protection. Hence, the basic environmental agencies and regulations were put in place, paving a basis for the development of environmental policies (R. Ye, 2008; Zhou & Ji, 2009, pp. 31-32). The period of 1978 to 1991 marked major progress in China’s environmental policies, though environmental pollution challenged the country’s environmental capacities. Environmental protection became a basic state policy as well as an essential item in the national economic and social development plan. Legally, it was written into the Constitution and legislated as the Environmental Protection Law, the first basic environmental law in effect at the end of 1970s. Based on the foundation, a
basic environmental legal framework was finally built by 1991 after a rapid development of environmental laws and regulations. Institutionally, the state environmental agency was upgraded to a low vice-ministry status to enhance national environmental management in 1988 (R. Ye, 2008; Zhou & Ji, 2009, pp. 32-33).

During the period from 1992 to 2002, as the overall environmental quality deteriorated, environmental protection gained a strategic 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, they focused on pollution and emission control and started to promote clean production, and green industries and technologies (R. Ye, 2008; Zhou & Ji, 2009, pp. 33-34). Since 2003, as environmental problems have tended to undermine public health and national growth, 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 with the promotion of SEPA to a cabinet ministry, the Ministry of Environmental Protection (MEP), in 2008, and the improvement of local environmental monitoring and environmental policy implementation. Environmental policies have attempted to curb expansion of
environmentally-sensitive industries, such as energy-intensive and emission-intensive industries and highly polluting industries, and to promote resource use efficiency and a recycling economy. 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, p. 35).

It is under this context that a series of environmental economic policy innovations have been conceived and studied by MEP since 2007. In fact, some of the policies could trace back to earlier times in the evolution of China’s environmental policies. However this time, MEP seems to have taken a holistic and systemic approach to designing and executing the environmental economic policies for best policy effects amid acute environmental problems. Based on market mechanisms, this series of policies tend to utilize economic tools, such as price, tax, credit, fees and insurance, to overcome environmental externalities and leverage economic actors’ market behaviors with an ultimate goal of striking a balance between economic development and environmental protection (Chinese Academy for Environmental Planning, 2007). The environmental economic policies have received high expectations from Chinese policy makers to become the most effective long-term mechanism for addressing China’s environmental challenges (Chen, Liu, & Xu, 2007).

The series of policies was kicked off by the Green Credit Policy, which was officially launched in 2007. Afterward, the Green Insurance Policy and Green Securities Policy were released in 2008. As a policy in the interface of
environmental and financial policy, the Green Securities Policy was co-developed by MEP and the state securities agency, the China Securities Regulatory Commission (CSRC). It targets Chinese listed companies in highly polluting industries and aims to restrain their excessive expansion, improve their environmental performance and control financial risks (State Environmental Protection Administration, 2008). The policy has three pillars, a Green IPO, or a mandatory environmental inspection companies in highly polluting industries must undergo before obtaining their initial public offerings or before receiving refinancing from the market, and environmental disclosure and environmental performance assessment (Matisoff & Chan, 2008, p. 12). While the Green IPO has been widely enforced, the progress of environmental disclosure and environmental performance assessment of Chinese listed companies have somewhat lagged behind.

Environmental Disclosure Regulations in China

Although environmental disclosure under Green Securities Policy is a new regulation, environmental disclosure is somewhat a familiar theme in China’s evolving environmental policy system. Its idea is embedded in some basic laws released much earlier, such as the Constitution, Criminal Law, Company Law and Environmental Protection Law, in spite of the implicit and general provisions (Guo, 2005, p. 4; Lin, 2010, p. 68). One of the earliest environmental disclosure programs was the Green Watch program co-developed by 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 successful pilots, the program has been widely adopted throughout the country since 2006. Additionally, 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 since 2004 has built a good foundation for and also complemented the environmental disclosure regulation under the Green Securities Policy. CSR has been written into laws and regulations, such as the new Company Law in 2006 and the CSR guide for Chinese State-owned Enterprises (SOEs) in 2008, to promote CSR practices among Chinese companies (Lin, 2010; Moon & Shen, 2010). 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 guideline and encouraged the companies traded on SZSE to publish their CSR reports that 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, SSE Social Responsibility Index and SZSE Corporate Social Responsibility Index, which demonstrate the market performances of top listed companies in CSR performance trading A shares (Shanghai Stock Exchange, 2009; Shenzhen Stock Exchange, 2011a).

The new environmental disclosure regulation is under the umbrella of the Green Securities Policy that asks Chinese listed companies in 14 highly polluting industries that trade A shares on the SSE and the SZSE to report required 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). So far, three official documents have addressed specific environmental disclosure requirements: the policy statement of the Green Securities Policy, Instructing Opinions on How to Enhance Environmental Protection Monitoring and Management of Listed Companies, released by MEP in February 2008 (State Environmental Protection Administration, 2008); 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); and A Guide on Listed Companies’ Environmental Information Disclosure (Draft) (hereafter the
Guide) released by MEP in September 2010 (Ministry of Environmental Protection, 2010). Table 1 and Table 2 indicate the detail of all the requirements.

It is easy to notice the ambiguity and inconsistence of environmental disclosure rules for listed companies among the official documents.

| Table 1 Environmental Disclosure Requirements under the Green Securities Policy |
|----------------------------------|------------------|------------------|------------------|------------------|
| **Official documents**           | **Mandatory provisions** | **Voluntary provisions** | **Reporting form & media** | **Format** |
| 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 | No |
| SSE’s environmental disclosure guidelines | 1. 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; 2. Listed companies in highly polluting industries traded on the SSE should disclose 7 categories’ environmental information showed in Table 2; 3. Listed companies traded on the SSE named as heavy polluters should disclose required environmental information within two days after environmental agencies announce their names. | Based on their needs, listed companies traded on the SSE in general can choose to disclose 7 categories’ 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. | No |
| A Guide on Listed Companies’ Environmental Information Disclosure (Draft) | 1. 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; 2. They should | Listed companies in other industries are encouraged to disclose their environmental information based on the | Annual environmental reports should be published in corporate websites and the MEP’s website. Provisional environmental reports should be published in China Environmental | Yes |
publish provisional environmental reports within one day after any environmental emergency occurs. Guide. News 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**

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

Source: (Shanghai Stock Exchange, 2008)

**The Capital Markets and Governance of Listed Companies in China**

Built from scratch in the early 1990s, Chinese capital markets have undergone rapid growth. By the end of 2011, 2342 companies were listed in the markets with a total market capitalization of 21.5 trillion RMB, or around 3.3 trillion USD, ranking 3rd in the world only next to the USA and Japan (China Securities Regulatory Commission, 2011, p. 2). 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 national champions. Released in 2004, the
SME Board serves as a financing channel for small and medium companies with relatively mature growth. The ChinNext Board launched in 2009 was 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, that is, A shares that are priced in RMB and usually available to domestic investors, and B shares that are traded in USD and open to both domestic and foreign investors (China Securities Regulatory Commission, 2011, p. 13). 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 in the markets which held a market value accounting for 1.07% of the total market value of A shares in circulation in China (China Securities Regulatory Commission, 2011, p. 20).

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 SSE offers listings for Main Board A shares and B shares, SZSE has listings for Main Board A shares and B shares, SME Board A shares and ChinNext Board A shares.

Chinese stock markets as well as listed companies have enjoyed a strategic importance in the state agenda. 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 forward (Ewing, 2005; Jia & Tomasic, 2009, p. 12; Organisation for Economic Co-operation and Development, 2011; Yang & Sanders, 2007). Hence, it is not surprising to see the state dominance in Chinese capital markets even after several rounds of reforms, as often highlighted in the literature (Bell & Feng, 2009; Li & Zhang, 2010).

**Figure 1 The Institutional Framework of Chinese Listed Companies**

[Diagram of the institutional framework]

Sources: based on (Organisation for Economic Co-operation and Development, 2011, p. 18; Jia & Tomasic, 2009, p. 17)

It is helpful to review the multi-level institutional framework of Chinese listed companies, as illustrated in Figure 1, in order to better understand the
state dominance and the governance of listed companies. Here, the state-controlled listed companies refer to listed companies with the state as their controlling shareholders. Basically, the state has achieved its dominance by adopting two strategies, exerting its role as the actual controller of the state-controlled listed companies to leverage internal corporate governance and externally monitoring listed companies in general and the whole markets through securities regulatory agencies (Jia & Tomasic, 2009). Internal governance of the state-controlled listed companies is closely watched by the State-owned Assets Supervision and Administration Commissions (SASACs) through the supervision of the controlling shareholders. On behalf of the state, SASACs have the rights as investors, including appointment and assessment of key personnel and oversight of state-owned assets (Organisation for Economic Co-operation and Development, 2011, p. 27). Hence, the key corporate personnel in the board of directors, supervisory board and management team is largely leveraged by SASACs and essentially the internal governance of state-controlled listed companies can be in line with the state agenda (China Securities Regulatory Commission, 2002; Jia & Tomasic, 2009). Because of this unique institutional arrangement, the state-controlled listed companies actually enjoy hierarchical powers in the state apparatus (Jia & Tomasic, 2009; Yang & Sanders, 2007).

The external governance of listed companies in general is under the care of the China Securities Regulatory Commission (CSRC), the state securities agency
that oversees the capital markets and listed companies in China. The regulatory network of 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. When it comes to the environmental governance, the institutional framework of listed companies is overlaid by the environmental agencies led by the Ministry of Environmental Protection (MEP), which enforces environmental regulations, tracks companies’ environmental performance and pushes the improvement of environmental violators. The institutional framework of listed companies becomes more complicated when local governments are included. As the key players in local areas, local governments hold the power to leverage environmental governance of local listed companies through the oversight of local EPBs and Local SASACs and their subtle relations with local listed companies.

**THE LEVELS OF ENVIRONMENTAL DISCLOSURE BY CHINESE LISTED COMPANIES**

How have Chinese listed companies complied with environmental disclosure regulation under the Green Securities Policy? The main goal of this section is to assess the levels of environmental disclosure made by the listed companies in highly polluting industries regulated under the Green Securities Policy. The section is interested in learning how many of those companies reported required environmental information each year over the period of 2008 to 2010. It is also interested in learning the trend of environmental disclosure levels over years.
Here, the year 2008 is considered as the benchmark year when the environmental disclosure regulation under the Green Securities Policy was officially launched.

A number of Chinese studies have evaluated the levels of environmental disclosure by Chinese listed companies in highly polluting industries. Among them, there is a consensus that environmental disclosure made by the listed companies in polluting industries has increased over time but 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 petrochemicals and textiles, or a certain year (e.g. 2006) (Chen & Xue, 2010; Hu & Liu, 2011; Li & Guo, 2011; Wang, Fang, & Xing, 2009). Nonetheless, there are two comprehensive studies that stand out.

Shen and Li’s (2010) study included a sample of all companies in highly polluting industries listed on the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE), i.e. 502 companies, based on MEP’s industrial roster in 2003. The study examined both 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. Affiliated to the Chinese Academy of Social Sciences, Zhong, Zhang and Zhang (2011) conducted the most impressive empirical research on non-financial disclosure by Chinese listed companies in both scope and depth. Their research did not specially address the 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. In addition, it used quantitative tools to identify factors affecting non-financial disclosure. Their research suggested that the levels of social and environmental disclosure in the entire two markets were low in general.

Data and Method

Different from previous studies, the sample selection of this current study uses criteria and standards based on environmental disclosure regulation under the Green Securities Policy. Hence, the methods of this study follow the below steps:

1. The study selects all the listed companies trading A shares on the SSE and the SZSE;

2. The study narrows down the selection of Step 1 to the listed companies in the 14 highly polluting industries according to MEP’s 2008 industrial roster as
discussed before. The 2008 industrial roster was an update to MEP's 2003 industrial roster used in Shen and Li's (2010) study, expanding highly polluting industries from 8 to 14 industries. In addition, it excludes the listed companies marked with ST and *ST by the SSE and the SZSE due to their abnormal returns, as most of previous studies did. As a result, the sample sizes for the years 2008, 2009 and 2010 are 539 companies, 552 companies and 626 companies respectively.

3. The study downloads the sample companies’ annual reports for the years 2008 to 2010 from the official websites of the SSE (http://www.sse.com.cn) and the SZSE (http://www.szse.cn/). Therefore, it obtains 539 annual reports for 2008, 552 for 2009 and 626 for 2010 for analysis under this current study.

4. The study collects data using content analysis. As the dominant methodology for evaluating environmental disclosure, content analysis helps this study identify and locate the required environmental disclosure in annual reports if any (Chen & Xue, 2010; Gamble, Hsu, Jackson, & Tollerson, 1996; Hossain, Islam, & Andrew, 2006; Shen & Li, 2010; Walden & Schwartz, 1997). The criteria of required environmental disclosure are based on the 7 categories of environmental information prescribed in the SSE’s environmental disclosure guidelines, as illustrated in Table 2. Based on the criteria, the study conducts a computerized search on the text of annual reports. It assigns a score of 1 if the text includes any information that falls into any of the 7 required categories of environmental information, and a score of 0 if the text does not involve any
information related to the 7 categories. Lastly, the study obtains results based on the statistics of the data.

The methods of this study have several limitations. First, the sample selection of Step 2 is subjective. MEP’s 2008 industrial roster only included a list of 14 industries with some explanations of manufacturing types but the names of listed companies in these industries are not readily available (Matisoff & Chan, 2008, p. 8). Moreover, the SSE and the SZSE use a different scheme of industrial classification. Hence, it is subject to the author's discretion as to whether a listed company is a member of the 14 highly polluting industries. Secondly, annual reports are not necessarily the form used by listed companies to disclose their environmental information. Due to the ambiguity and inconsistence in the reporting form required under the Green Securities Policy, it is likely for some listed companies to disclose environmental information in corporate websites, annual environmental reports or other separate reports. The 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, p. 269). 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. Thirdly, 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 raw information. Since the annual reports are searchable PDF files, the study instead uses a keyword search using Chinese key words derived from the required 7 categories of environmental information. Lastly, it is also subjective regarding whether certain environmental information in the annual reports falls into the required categories.

**Results**

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

![Graph showing the number of listed companies trading A shares in Chinese capital markets from 2008 to 2011.](graph.png)

Sources: The data is calculated by the author based on (Shanghai Stock Exchange, 2011, p. 2; Shanghai Stock Exchange, n.d., p. 5; Shenzhen Stock Exchange, 2011b, p. 6).

Figure 2 gives an overview of the total number of listed companies trading A shares in Chinese capital 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 1581 to 2320 with a striking 46.74% rate of growth. It is easy to see that the spike is mainly attributed to the fast growth of listed companies selling A shares on the Shenzhen Stock Exchange (SZSE), 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 innovative startup companies once the door of Chinese capital markets is open to them. In regard to the listed companies in highly polluting industries trading A shares in the markets, they grew from 570 to 741 in number from 2008 to 2011, a 30% rate of growth. Judging from the whole markets comprising 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, i.e. about 1/3, of the total number of listed companies in the markets, although the ratio has dropped from 35.08% in 2008 to 31.64% in 2011.

Figure 3: Ratio of State-controlled Listed Companies in Highly Polluting Industries (A Shares)
Sources: The data is collected and computed by the author.

As discussed earlier, the state has still dominated Chinese capital markets.

Hence, it would be interesting to see how many of the listed companies in highly polluting industries trading A shares in the markets are actually state-controlled listed companies (including listed companies with abnormal returns), as illustrated in Figure 3. Whereas the ratio on the SSE is steady, i.e., around 68% of the listed companies in highly polluting industries selling A shares on the SSE are state-controlled companies, the percentage of those on the SZSE quickly dropped from 55.17% to 36.75% from 2008 to 2011. As a result, the proportion of state-controlled listed companies in highly polluting industries trading A shares in the combined markets, declined substantially over time, from 62.63% in 2008 to 49.93% in 2011. This, again, is due to the large flow of new listings from small and medium companies and innovative startup companies, most of which are private businesses. Nonetheless, it is not hard to see the state dominance in overall highly polluting industries over the period of 2008 to 2011.

**Figure 4: Levels of Environmental Disclosure of the Sample Companies, 2008-2010**
The key findings of this current study are listed and illustrated in Figure 4, which demonstrates the levels of environmental disclosure by the listed companies in highly polluting industries selling A shares during the period of 2008 to 2010. The number of sample companies is different for each year due to the change in the total listings and the number of listed companies with abnormal returns in Chinese capital markets. On the SSE, the sample size is 294, 291 and 284 respectively for the years 2008, 2009 and 2010. Sixty-seven point zero four percent of the sample companies traded on the SSE reported required environmental information in 2008, rising to 67.35% in 2009. However, only 65.85% of the sample companies listed on the SSE did so in 2010. In the SZSE’s case, 245, 261 and 342 sample companies are studied for the years of 2008 to 2010 respectively. The rate of required environmental reporting increased from 50.20% of the sample companies to 52.87% in 2009, and finally jumped to 56.14% in 2010. In regard to the combined capital markets, the overall environmental reporting rate increased from 59.37% in 2008 to 60.51% in 2009,
and slightly climbed up to 60.54% in 2010. Although much lower than Shen and Li’s study (2010), the levels of environmental disclosure found in this study are generally consistent with several previous studies (Li & Guo, 2011; Wang, Fang, & Xing, 2009). Additionally, the levels of environmental disclosure on the SZSE are found to be substantially lower than that on the SSE in this study, which is consistent with Hu and Liu’s study (2011). The reason could be the launch of environmental disclosure guidelines on the SSE, in contrast to no regulation on the SZSE specifically addressing environmental disclosure, as suggested by Hu and Liu (2011).

To conclude, the levels of environmental disclosure by Chinese listed companies in highly polluting industries trading A shares increased over time but remained low from 2008 to 2010 after the launch of the Green Securities Policy. There are caveats with regards to the results in this study. First, due to widely varying samples and methodologies, findings in different studies assessing environmental disclosure in China are not quite comparable and are not necessarily generalizable to the whole Chinese capital markets. The consensus among this current study and previous studies is that environmental disclosure is growing over time but that the disclosure level is low in China. China’s lackluster performance on environmental disclosure can be better understood in KPMG’s 2011 study on global corporate responsibility reporting (KPMG, 2011, p. 10). Among the top 17 countries in environmental reporting rate, the UK and Japan are the two global leaders, with 100% of the UK
companies and 99% of the Japanese companies surveyed reporting, and with Mexico taking 17\textsuperscript{th} spot with a rate of 66%. By contrast, only around 60% of the Chinese companies surveyed issue environmental reporting. Secondly, the quality and substance of environmental disclosure by the sample companies is beyond the scope of this current study. This study merely probes into whether the sample companies reported any required environmental information. During the analysis of the annual reports, the author strongly felt the poor quality and inconsistence of the sample companies’ environmental disclosure. For example, the information reported is very limited and most of them are rhetoric lacking substance and are hard to verify. Some companies disclosed much less information for the year 2010, in contrast to more space devoted to environmental information in their 2008 and 2009 annual reports. Additionally, environmental information reported by the companies listed on the SZSE is substantially less in amount and poorer in quality than the SSE. There is much more room for future studies to assess the quality and substance of the environmental disclosure made by Chinese listed companies in highly polluting industries.

THE DYNAMICS UNDERLYING ENVIRONMENTAL DISCLOSURE BY CHINESE LISTED COMPANIES

As explained, despite the overall increasing trend of environmental disclosure by Chinese listed companies in highly polluting industries, environmental disclosure has remained at relatively low levels since 2008. When
it comes to the entire market, 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).

What might be the cause of this under regulation of Chinese listed companies in highly polluting industries? Due to a lack of empirical data, it is beyond the scope of this study to uncover the potential correlation behind poor disclosure. Instead, this study tries to show a big picture of the dynamics underlying environmental disclosure by Chinese listed companies. The prior existing dynamic interrelationships have created problems that impede environmental reporting by Chinese listed companies. To understand the problem further, this study borrows the lens of Ecological Modernization Theory (EMT) to identify and interpret the dynamics in terms of political modernization, economic actors and market dynamics, civil society and the media, and international integration.

In this section, the first part is a brief review of EMT. Despite a young theory, EMT is a very flexible and embracing theoretical framework which examines institutional developments and social practices in the ecological institutionalization of modern societies. Hence, the theory is a promising candidate to capture unique political and social dynamics behind environmental disclosure by Chinese listed companies. The second part is an in-depth analysis of the dynamics behind environmental disclosure by Chinese listed companies
through the lens of EMT. The dynamics are interpreted in four dimensions, political modernization, economic actors and market dynamics, civil society and international integration in China’s current process of ecological modernization.

**Ecological Modernization Theory (EMT)**

Since its advent in Europe in 1980s, EMT has quickly gained prominence and initiated wide debates and discussions in environmental social science (Buttel, 2000). Although it embraces a large variety of perspectives, EMT boasts some distinctive and dominant viewpoints. Fundamentally, the theory views the increasingly significant environmental interests and rationalities in the modern society as a new independent ideology—a green ideology—parallel to conventional political ideologies. Hence, modern society undergoes an ecological institutionalization in institutional development and social practices that would ultimately reach a relatively permanent status (Mol, 2001; Mol, 2006, p. 33). So far, the scholarship on EMT has mainly focused on five themes in the examination of ecological transformations and reforms in social and institutional dimensions, that is, the changing role of science and technology, the growing importance of economic actors and market dynamics, the transformation of nation-state, the new role of social movements and the changing practices and ideologies in political and social realms (Buttel, 2000; Mol, 2001, pp. 61-62). Despite its popularity, EMT is not immune to criticisms, as is frequently attacked for its broad, vague and competing perspectives (Buttel, 2000).
EMT was originally applied to European countries and afterwards to other developed countries. The recent research agenda of EMT is to test its applicability to developing countries, such as China, Vietnam and Kenya (Mol, 2001, pp. 167-198). In regard to China, a few studies have integrated EMT to explore China’s environmental programs but most of them did not utilize the theory’s perspectives and structures as the analytical tool (Li & Lang, 2010; Park, Sarkis, & Wu, 2010; Zhu, Geng, Sarkis, & Lai, 2011). Zhu, Geng, Sarkis and Lai (2010) use the concept of “new politics of pollution” under EMT to understand Chinese manufacturers’ green supply chain management practices. The study found that commercial practices were affected by the manufacturers’ awareness of existing compliance on energy conservation, pollution reduction and regulatory pressure. China’s path of ecological modernization was officially acknowledged in a book written by Chinese Academy of Sciences with a detailed account of China’s ecological modernization (China Center for Modernization Research, 2007). The book elaborated China’s overall ecological modernization strategies, recorded the evolution of China’s ecological modernization from 1970 to 2004 and also evaluated regional and national performances on ecological modernization.

To conclude, EMT is a useful theoretical tool to examine environmental restructuring and transformation in both developed and developing countries. In China’s case, it would be interesting to test EMT’s usefulness in examining specific environmental policies in China, which is essentially pursued in the
current study. Unlike Zhu et al.’s study (2011), this study uses different concepts and structures under EMT, building upon Arthur Mol’s insightful study in 2006 with interesting interpretations of China’s ecological modernization. To argue that China is undergoing ecological modernization, Mol grasped and highlighted key features of China’s ecological modernization in four dimensions (Mol, 2006).

China’s political modernization is indicated by the decentralization of environmental governance, separation between the state and SOEs and the establishment of an environmental legal system. These changes are complemented by the participations of economic actors, market dynamics, and civil society that have showed growing environmental interests. Additionally, China’s international integration has also exerted positive influences on its environmental reforms. While Mol’s study depicted China’s overall ecological modernization, this current study focuses on interpreting a specific environmental regulation through the lens of EMT, that is, environmental disclosure under the Green Securities Policy. Given that environmental disclosure is a policy tool relying on the interaction between policies, the market and civil society to be effective, EMT is a promising candidate to capture and uncover the underpinning dynamics.

An Analysis of the Dynamics through the Lens of EMT

Political Modernization

In the process of ecological institutionalization, the nation-state is still a key
actor yet it has dramatically 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 role that embraces growing participation of non-state actors and international and supra-national institutions, which is often referred as political modernization (Mol, 2001, p. 62). In today’s transitional China, environmental interests have enjoyed a high priority in the state agenda, as environmental deterioration poses a serious challenge to the state legitimacy (Jia & Tomasic, 2009; Lin, 2010; Ma, Webber, & Finlayson, 2009; J. Wu, 2009). The consequent political modernization can be mainly observed in the flexible new environmental governance framework with increasing local autonomy, inclusion of economic, social and international actors and a fairly sound environmental policy system following the decentralization of the state, political structures and institutions (Mol, 2006; Shi & Zhang, 2006).

In regard to environmental disclosure, the new environmental governance framework has allowed for large local autonomy to make local policies and design specific programs fitting in local regions in order to improve local companies’ environmental disclosure (Guo, 2005, pp. 16-21). Meanwhile, it has encouraged the involvement of investors, creditors, civil society, the media and international actors to push listed companies for more environmental transparency. China’s fairly sound environmental policy system has provided good basis for promoting environmental disclosure of listed companies. In
particular, 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.

Nonetheless, despite the overall positive trend in political modernization, several major problems in the environmental legal framework and governance have impeded the progress of environmental disclosure by listed companies. The first major problems are deficiencies and loopholes in the legal structure of the environmental disclosure regulation under the Green Securities Policy. As mentioned earlier, the basic laws only include very general and implicit provisions relating to environmental disclosure, and this is unlikely to impose legal requirements upon listed companies in the case of no environmental disclosure (Guo, 2005, p. 4; Lin, 2010, p. 68). Apparently, there is a need to update the basic laws with clear and strong provisions that specifically address environmental disclosure by listed companies.

The environmental disclosure requirements provided under the Green Securities Policy are underdeveloped in light of the broad, ambiguous, inconsistent, and “soft” language with little legally binding force among different official documents (Southern Weekend, 2010; Wang Y., 2011). There are ambiguities and discrepancies in environmental disclosure types (mandatory or voluntary), forms (CSR reports, individual reports or annual environmental reports), media (corporate websites, MEP website, or other), time frames (reporting environmental incidents immediately, within one day or two days
after they occur), formats and contents, which can cause confusions 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 as to put
mandates on environmental disclosure by Chinese listed companies in highly
polluting industries.

Generally speaking, environmental disclosure requirements under the Green
Securities Policy have weak legal effects. As admitted by MEP, the Green
Securities Policy was incomplete in 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 tried to consolidate the previous requirements and
offer detailed guidelines to standardize environmental disclosure practices of
listed companies. Nevertheless, so far it is still a draft and has not yet been
upgraded to a legally binding document. It is hard to imagine how listed
companies would commit to environmental disclosure if clear, firm, and legally
binding rules are missing in the first place.

The second major problems are the bureaucratic turf battles and
multi-agency problems embedded in the environmental governance of listed
companies due to their overlaid institutional framework (Economy, 2006; Mol, 2006; F. Wu, 2009; J. Wu, 2009). There are potential conflicts between two competing camps. The state-owned assets agencies led by 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 headed by the MEP prioritize environmental interests. The competition between the two camps would be even more complicated if other government agencies connected to the governance of listed companies were to be involved as well (Organisation for Economic Co-operation and Development, 2011; F. Wu, 2009). As a result, the amount of regulatory pressure on listed companies depends on which camp wins and also the nuances of these 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 have hierarchical powers. This unique Chinese characteristic could deter regulatory efforts from environmental and securities agencies lower in the hierarchy (Jia & Tomasic, 2009; Yang & Sanders, 2007).

A good example of potential clashes is the coordination problem between MEP and CSRC on the Green Securities Policy. 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, compared to MEP, CSRC has more power in regulating and leveraging listed companies given its role as the
rule maker in Chinese capital markets. Whereas MEP and CSRC showed some collaboration on Green IPO, which is currently stagnant due to the lackluster participation of CSRC, environmental disclosure by listed companies has been somewhat unilateral efforts of MEP since its release (Lv, 2012). Both the policy statement of Green Securities Policy and the Guide were issued by MEP. As the key agency, CSRC has so far not released any specific regulation that addresses environmental disclosure by listed companies. It is hard to expect the due attention of listed companies to environmental disclosure without the participation and support of CSRC. Hence, it is unsurprising that the MEP and CSRC have not built an effective mechanism to share information, nor have they been able to coordinate and harmonize decision-making (Cao, Jiang, & Cao, 2010; Ji, 2009). The coordination problem between MEP and CSRC can be seen as a major barrier to development of environmental disclosure under the Green Securities Policy.

Local agencies have their own agendas and priorities that are not necessarily in line with that of corresponding state agencies (Economy, 2006; Ewing, 2005; Ma, Webber, & Finlayson, 2009; J. Wu, 2009). State agencies have increasingly aligned themselves with environmental interests, leading to more stringent state environmental regulations. Local agencies have been 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 large 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. Yet, it is the critical position often shared by local governments and local listed companies that have complicated the governance of listed companies. Local listed companies are usually the local champions with significant contributions to the local employment and tax revenues. For instance, Zijin Group had a large share of the local tax revenue in 2010. This company specifically collected 70% of the total revenue in the county where it is located (Zhou, 2010). Additionally, many local listed companies are directly funded by local governments, or their executive leaders have strong personal connections with local governments. Hence, in many cases, the environmental transparency of local listed companies hinges upon how local governments and listed companies weigh environmental disclosure against economic gains. Ultimately it is the local governments’ protection of local 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 environmental agencies are at a particular disadvantage. They are widely known for their insufficient institutional capacities and weak powers that in turn leads 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). Hence, 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 & Market Dynamics

In ecological modernization, economic actors, such as producers, clients, consumers, financial institutions and business communities, etc. are increasingly involved as social agents of ecological restructuring and reforms. This trend is complementary to the state agencies and environmental civic groups. They utilize economic rules and tools to achieve environmental goals. It comes along with transforming state-market relations in environmental institutionalization (Mol, 2001, p. 61).
In China, as the market-based economy thrives, the emerging economic actors and market dynamics have an increasingly important role in China’s ongoing environmental reforms and new environmental governance framework (Economy, 2006; Shi & Zhang, 2006). Recent years have seen a growing number of voluntary green initiatives in Chinese capital markets, which indicates the market’s new appetite on environmental interests. Good examples include the social responsibility indices launched by the two stock exchanges, as mentioned before, and TEDA Environmental Protection Index released by a subsidiary of the SZSE in 2007, the first of its kind in China that captures the stock prices of leading listed companies in green industries trading A shares in the markets (Shenzhen Securities Information Co., Ltd, 2011). In addition to voluntary initiatives in the markets, the Chinese government has employed a number of economic instruments to incentivize environmental compliance while punishing violation (Economy, 2006). Currently, the most widely used tools are environmental fines and discharge fees, putting an economic cost to companies’ environmental noncompliance. Many economic tools are under study by Chinese policy makers such as SO₂ cap-and-trade and environmental taxes both aim to force companies to internalize their environmental costs.

Still, the rising environmental interests have yet to turn into mainstream practices in Chinese capital markets where economic interests still dominate. In 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 a majority of the investors and credit institutions still attach more importance to financial returns of listed companies while neglecting the corresponding environmental risk. 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, p. 34). 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 notorious environmental records (X. Yu, 2011, p. 156).

While investors of Chinese listed companies include institutional investors and minority investors, it is the institutional investors that are considered strategically important for the reform and development of Chinese capital markets in the state agenda. By the end of 2011, there are 686, 800 institutional investors, holding up to 73.45% of the total market value of A shares in circulation (China Securities Regulatory Commission, 2011, p. 19). However, institutional investors still have limited environmental awareness and institutional capacities to drive listed companies for more environmental
As to minority investors, their limited rights and voices make it difficult for them to effectively influence the governance of listed companies. Meanwhile, they focus on short-term financial returns and generally don't have incentives to push listed companies for more environmental transparency (Lin, 2010). Zijin's rising stock prices after its toxic spill in 2010 is a good example to indicate Chinese investors' keen interest in speculation and low environmental awareness (Zhou, 2010).

Economic tools used by the government are insufficient in their numbers and effects. Given the limited economic tools adopted currently, a range of environmental noncompliance and other violation are not associated with environmental liabilities under the current penalty system. That is to say, only a small portion of Chinese companies' environmental externalities are translated into their economic costs. Furthermore, for environmental fines and discharge fees, their scheduled penalty amounts are too low to effectively deter companies' environmental noncompliance (J. Wu, 2009). For example, the fine paid by Zijin for its toxic spill, 9,563,130 RMB, was recorded as the largest environmental penalty since the founding of China. However, it was merely 0.27% of Zijin'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). Moreover, low penalties make it harder for listed companies' environmental risk to be factored into the decision making of their financial
stakeholders who could have large influences on environmental disclosure by
listed companies.

*Civil Society & the Media*

In ecological institutionalization, environmental movements have new roles, ideologies and positions. Instead of being marginalized, environmental movements are increasingly participated in decision-making processes of the state and market (Mol, 2006, p. 35). China’s ecological institutionalization has seen a rise in public participation in the new environmental governance (Shi & Zhang, 2006; F. Wu, 2009). It is attributed to the mounting public concerns on environmental quality, as environmental deterioration has threatened public health and the growing space allowed for public participation in China’s new political landscape (G. Yang, 2005). 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).

Accompanying the increasing public participation is the rapid growth of Chinese home-grown environmental non-governmental organizations (ENGOs) both in their number and influence in China’s new environmental governance. Since the founding of the first ENGO in 1991, the number of Chinese ENGOs in mainland China reached the number of around 3,300 by October, 2008 (All-China Environment Federation, 2008, p. 3). The rise in the number of ENGOs
is tied to the current tide of China’s unique political landscape where environmental issues are assigned lower political sensitivity as compared to hot button issues such as democracy and human rights. Hence, the Chinese government is more tolerant towards Chinese ENGOs’ environmental activities. Moreover, the central government tends to give more space to ENGOs, adding pressure upon local governments especially with respect to their inaction in the past (Lin, 2010; Ma, Webber, & Finlayson, 2009; J. Wu, 2009; G. Yang, 2005).

At present, the main role of Chinese ENGOs still is to educate the public so as to raise environmental awareness and engage them in environmental protection and governance through environmental campaigns, trainings, volunteering, and other events (All-China Environment Federation, 2008; G. Yang, 2005). In recent years, Chinese ENGOs have become increasingly involved in activities of a political nature (Tang & Zhan, 2008). They monitor governmental implementation of environmental regulations, track corporate environmental performances and mobilize resources to deal with governmental inactions and corporate environmental violations (All-China Environment Federation, 2008).

For instance, a big pollution scandal drew wide national attention in 2011 which occurred in the plant of a large pharmaceutical company listed on Shanghai Stock Exchange (SSE), Harbin Pharmaceutical Group Holding Co., Ltd (Economic Information Daily, 2011). After investigations, four Chinese ENGOs found out more environmental violations previously committed by the company. As early as 2009, Harbin Pharmaceutical was named by the local environmental
agency as a heavy polluter but did not disclose any related environmental
information subject to SSE’s environmental disclosure guidelines. Therefore, the
ENGOs wrote an open letter to MEP and SSE and push them to punish Harbin
Pharmaceutical and suspend its refinancing from the markets based on Green
IPO and environmental disclosure regulation under the Green Securities Policy.

Chinese ENGOs have attempted to sway environmental decision making of
the Chinese government (Tang & Zhan, 2008; G. Yang, 2005). For example, after
it announced *A Guide on Listed Companies’ Environmental Information Disclosure*
(*Draft*), the MEP provided 10 days for public comment on the improvement of
provisions for the *Guide*. Chinese ENGOs, Friends of Nature and Green Earth
Volunteers, took advantage of the opportunity and submitted their
recommendations. Besides the revision of text and language, they particularly
pointed out the weak legal binding force of the *Guide* (Friends of Nature, 2010;
Green Earth Volunteers, 2010).

Despite their active presence in recent years, Chinese ENGOs are confronting
political and financial barriers restricting them to take a more proactive and
significant role in China’s environmental governance. 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 (2008, p. 4), 7.2% of the 465 Chinese NGOs
surveyed were unregistered. Secondly, as an organizational strategy, Chinese
ENGOs generally take a non-confrontational position against the Chinese
government (Tang & Zhan, 2008). They strive to pursue their organizational environmental agendas within the political boundaries, which limit their activities in politically-sensitive yet crucial environmental issues (Lin, 2010). 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, p. 437). Thirdly, because of the lack of a strong 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, p. 41; Tang & Zhan, 2008).

The increasing public participation is also accompanied by the active role of Chinese media in new environmental governance. Although it is still leveraged by the government, Chinese media has gained greater independence since media commercialization in the late 1980s following China’s reforms. This is especially true for the Internet which enjoys increased flexibility due to less governmental monitoring than traditional forms of news media (Ma, Webber, & Finlayson, 2009, p. 75). In recent years, Chinese media has served as a critical platform for Chinese citizenry and ENGOs to participate in environmental governance. For Chinese ENGOs, the media has offered a cost-effective and efficient avenue to disseminate environmental information and conduct environmental advocacy (Shi & Zhang, 2006). It is also a powerful tool for ENGOs to draw public attentions to critical environmental issues and for reaching a broader audience.
in a short time (All-China Environment Federation, 2008). For Chinese citizens, the Internet particularly provides an inexpensive and convenient place to express environmental concerns and discuss environmental issues. Studies indicate public opinion expressed on the Internet, such as online forums, postings and blogs, have pushed Chinese government to address various issues (Ma, Webber, & Finlayson, 2009, p. 77).

Meanwhile, Chinese media itself has become a vital actor in China’s environmental governance (G. Yang, 2005). It has stood front page in the reporting of key environmental issues and holding polluting companies and regulators accountable (Ma, Webber, & Finlayson, 2009). Major environmental accidents like Zijin and Harbin Pharmaceutical’s pollutions were extensively covered and discussed in Chinese media, creating mounting pressures on environmental violators and regulators. Nevertheless, Chinese media faces political and economic constraints, that is, it has to meet governmental restrictions for organizational legitimacy while at the same time meet market demand for earning profit (G. Yang, 2005, p. 56). Although Chinese media offers a venue for the public to obtain environmental information reported by Chinese listed companies, Chinese media is limited in its influence regarding the environmental disclosure by listed companies in general.

*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, p. 35). 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 environmental impacts of international institutions, regimes and practices can be observed in China’s institutions, civil society and market.

In a closer look at institutions, the establishment and development of China’s environmental policy system has been influenced by international environmental movements, cooperation and consultation in terms of institutional configuration and policies (F. Wu, 2009, p. 389). Many of Chinese green policy innovations are the result of integrating more advanced international environmental practices. Some new environmental programs are co-developed by the Chinese government and its international partners who provide funding and technical assistance. For example, since the 1990’s, a series of environmental economic policies have been developed through the close collaboration of Chinese government with the World Bank, Organization for Economic Co-operation and Development, Asian Development Bank, United Nations Environment Programme and United States Environmental Protection Agency (State Environmental Protection Administration, 2007b). The China-US
Center for Sustainable Development is a good example of public-private partnership between China’s Ministry of Science and Technology and a US-based NGO to develop programs addressing China’s sustainable development issues (Economy, 2006, p. 182). These new environmental policies and programs have helped China to combat the rise in new environmental challenges.

In 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 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 while also experiencing 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.a). Consequently, by the end of 2011, 548 companies had responded to their environmental records in PITI under pressures and claimed their environmental improvements (Institute of
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). Therefore, they have made a number of initiatives to voluntarily achieve accreditations by international green standards, employ green practices and perform environmental responsibilities. A good example is the voluntary compliance of Chinese companies, including many listed companies, on the popular international codes of social and environmental disclosure. These codes include Global Reporting Initiative, United Nation Global Compact and ISO 26000 (BSR, 2009, pp. 75-76; Zhong, Zhang, & Zhang, 2011, p. 45). 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, p. 181).

China's global integration has not yet been a force able to fundamentally transform its institutional, social and market domains. Politically speaking, the Chinese government is still cautious about political implications associated with international influences and hence has made concerted effort to limit their scope and influence (Mol, 2006). In 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 in China, only Chinese companies competing globally have strong incentives to improve their environmental performances in order to gain more competitiveness in the global market. Chinese companies with a focus on domestic market generally are reluctant to pay costs for going green due to the lack of market incentives and pressures. With respect to multinational corporations in China, on one hand, their green influences are not strong enough to stimulate wide adoption of green practices among Chinese domestic companies. On the other hand, a number of large multinational corporations have left controversial environmental records in Chinese supply chain in recent years (Friends of Nature, Institute of Public and Environmental Affairs & Green Beagle, 2010).

CONCLUSION

In recent years, the mounting environmental pressures and the inability of conventional command-and-control regulation measures have forced the Chinese government to resort to new green regulations that utilizes economic tools and market mechanisms. One of these new green regulations is the environmental disclosure regulation under the Green Securities Policy examined in this study. This current study first assessed the levels of environmental disclosure by the listed companies in the 14 highly polluting industries. It
collected data from annual reports of the sample companies for the years 2008 to 2010 and used content analysis to determine the proportion of the sample companies that disclosed required environmental information in their annual reports. Despite some increase over time, the level of environmental disclosure has remained lackluster, from 59.37% of the sample companies reporting in 2008 to 60.54% in 2010.

This study then analyzed the interconnected dynamics surrounding the environmental disclosure by Chinese listed companies through the lens of Ecological Modernization Theory. China’s ecological modernization has generally created a positive political and social environment for environmental disclosure by listed companies. However, a number of problems in China’s current process of ecological modernization have created barriers to environmental disclosure by listed companies. In terms of political modernization, deficiencies in environmental legal framework and bureaucratic wars and multi-agency problems in environmental governance have impeded the progress of environmental disclosure by listed companies. In particular, there is a coordination problem between MEP and the China Securities Regulatory Commission (CSRC). Additionally, there is also the dominant economic interests of local governments that tend to conflict with environmental regulation.

In terms of economic actors and market mechanisms, financial stakeholders of Chinese listed companies still focus more on listed companies’ financial returns and neglect their environmental risk. Moreover, economic tools utilized
by Chinese government are limited in number and effect, especially the excessively low environmental penalties. In terms of civil society, Chinese ENGOs and media have an increasingly important role in contributing to China's environmental governance. Even still, both of these entities face political boundaries which have limited their environmental advocacy. In terms of international integration, the development of China's green policies and the growth of Chinese ENGOs and Chinese companies competing globally have benefited from green international influences. So far the influence of international actors has yet to fundamentally change China’s political and social landscapes.

Environmental disclosure by Chinese listed companies is embedded in China’s current environmental governance that is characterized as having a strong state influence but weak checks and balances from economic actors, civil society, the media as well as international actors. For these reasons, the problems in political and regulatory domains are the major hurdles to the success of environmental disclosure by Chinese listed companies. It seems apparent that many of these ongoing barriers to change are inherent to China’s long-established political and bureaucratic system. They are systemic problems that can only be fixed with holistic changes in the whole system.

This study provides several recommendations. First, there is an urgent need to put clear and firm language in environmental policy that is legally binding. Such rules would serve as solid legal basis for the enforcement and
implementation of environmental disclosure regulation under Green Securities Policy. A Guide on Listed Companies’ Environmental Information Disclosure (Draft) released by MEP in 2010 is a positive step in this direction. However, the text and language of the Guide needs to be revised and improved based on public comment. After these changes are made, the Guide should come into force as a legally binding document as soon as possible.

Secondly, the MEP and CSRC should enhance their coordination and cooperation on the development and enforcement of environmental disclosure regulation under the Green Securities Policy. They should work on building an effective mechanism to share information of listed companies’ environmental performance, violation and environmental reporting, and coordinate their institutional decision making with regards to regulation. As the key state actor in the Green Securities Policy, CSRC should particularly make more institutional efforts to improve environmental disclosure by listed companies. This is particularly true given that it has not released any regulation specifically addressing environmental disclosure by listed companies in Chinese capital markets to date. Since it is this agency that holds the power to directly influence listed companies, CSRC should take more responsibility in forming initiatives to push listed companies to environmental disclosure. At the moment, it is urgent for the CSRC and MEP to work on the Guide and jointly release it as soon as possible.

Thirdly, it is worth considering improving the implementation of regulatory
policy by tying environmental disclosure by local listed companies to local
governments' delivery of public services. The real motivation behind Chinese
local governments' widely known strong economic agenda relates to the political
careers of local governmental officials. Hence, policies that tap into this unique
characteristic of Chinese local politics would have some chance to achieve
projected policy goals. For instance, implemented in the late 1990s, National
Environmental Model City, a program that ranked Chinese cities based on their
environmental performances, was recognized as a successful model that
effectively pushed local leaders to improve local environmental conditions
(Economy, 2006; Rock, 2002). The key to the program's success lies in the
National Environmental Model City award. This award holds the potential to help
local areas attract foreign investments and in becoming a host for large
international events (Economy, 2006, p. 178). Despite its success, these kinds of
policies do not always succeed. The short-lived Green GDP program in China,
from 2004 to 2006, suggested that environmental programs would end up failing
if they put local governmental officials’ political career at stake in an abrupt and
radical way (Li & Liang, 2010). Hence, a caveat here is that these policies or
programs should be carefully formed and implemented.

Lastly, this study encourages the involvement and advocacy of Chinese
ENGOs to add pressure on listed companies and push them for greater
transparency of their environmental record. Currently, Chinese ENGOs have
played an active role in tracking the environmental performances of large
multinational corporations in China and polluting Chinese companies. However, their activities and participations in environmental disclosure by listed companies are limited, except indirectly through attracting public attentions to big environmental incidents of some listed companies. Based on this study, there is a need for Chinese ENGOs to educate financial stakeholders and the public to further raise their awareness about the importance of environmental disclosure by listed companies. Moreover, there is also a need for them to take advantage of the current data they have on Chinese companies’ environmental performance and to make the environmental data of Chinese listed companies readily available to the public.

There is a great need for future studies to further address environmental disclosure regulation under the Green Securities Policy. First, future research can use quantitative analysis to examine whether there is a statistically significant difference in the levels of environmental disclosure by the listed companies in the 14 highly polluting industries prior to and after the release of the Green Securities Policy. Secondly, future research can utilize quantitative tools to evaluate the quality of environmental information reported by the listed companies in highly polluting industries and also to identify factors that affect those companies’ environmental disclosure levels. Thirdly, future research should interview key stakeholders in the environmental disclosure under Green Securities Policy to gain a more detailed understanding of the relationships between different stakeholders and also the barriers to more effective
regulation.

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