

**Governance without Government: Emerging Private Environmental  
Authority in Taiwan's ICT Industry**

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## ABSTRACT

In recent years, international nongovernmental organizations have created non-state market-driven (NSMD) governance systems whose purpose is to develop and implement environmentally and socially responsible management practices. These governance systems have relied upon the market's green supply chain to create incentives and force companies to comply.

This paper develops an analytical framework designed to understand better the emergence of NSMD governance systems and the conditions under which they may gain authority to create policy. Its empirical focus is on the case of ICT industry in Taiwan. It aims at NGOs-firms interplay through market's green supply chain mechanism in establishing rules, standards and authority that guide the behavior of the participants. This paper argues that this new type of private environmental governance system might challenge existing state-centered authority and public policy-making processes, and reframe power relations within domestic and global environmental governance.



## 1、Introduction

Climate change is now recognized as an important global phenomenon and is mostly driven by human activity, primarily through the release of carbon dioxide into the Earth's atmosphere from the combustion of fossil fuels. Increased atmospheric concentrations of carbon dioxide and certain other gases give rise to the so-called greenhouse effect. In the absence of any serious effort to reduce net emissions of these greenhouse gases, the effects of climate change on ecological, social and economic system will be dramatic. However it is possible both to mitigate the degree of climate change and to adapt to the effects without drastically reducing global economic growth. Yet mitigation and adaptation will require dedicated and concerted effort on the part of governments, private firms, international agencies, civil society, and individual consumers. The issue of regulating greenhouse effect has been addressed from international level, with the United Nation negotiating with its member states that leads up to the Kyoto Protocol; to national level, with governments regulate industries' use of fossil fuels by setting vehicle emissions standards or mandating the adoption of climate-friendly technologies; and even move further toward non-profit organizations vs. firms or firms vs. firms, with global lead firms require local suppliers engage in "Green Supply Chain Management (GSCM)" or implement

“Carbon Disclosure Project (CDP)” and/or “Electronic Industry Code of Conduct (EICC)”. This study aims at Taiwan's unique Information and Communication Technology (ICT) industry. In face of the European Union's strict environmental directives and the Greenpeace green electronics campaign against brand companies, it investigates how Taiwan's ICT industry are forced to join with global lead firms to respond to climate change and sustainable development. It focuses on NGOs-firms interplay through market's green supply chain mechanism in establishing rules, standards and authority that guide the behavior of the participants and affect the opportunities available to others.

Existing political science literature focus on the role of “private interfirm regimes” (Cutler, Haufler and Porter, 1999; Haufler, 2001) and the “privatization of environmental governance” in international spheres (Clapp, 1998; Lipschutz, 2001; Lipschutz and Fogel, 2002; Cashore, 2002). Cashore (2002) criticized that most part of the Cutler et al.'s (1999) piece excludes “the case of Non-State Market-Driven (NSMD) governance” and neglects cases such as “forestry, fisheries, tourism, coffee, and food production where *non-business* interests hold, or compete for, private governance decision-making authority”. Cashore (2002) claimed that domestic and transnational private governance systems derived their policy-making authority not

from the state, but from the manipulation of global markets and attention to customer preferences. Therefore, the roles that business actors and NGOs play are no longer limited to shaping the traditional policy cycle. They can be extended to agenda setting, influencing decision-making processes, implementing commitments and monitoring state compliance. In other words, they have developed governance structure and social and environmentally focused rules regarding the production and sale of products and services. In consequence, Pattberg (2006) argues that private actors progressively “begin to establish, maintain, verify, and monitor their own private regulations beyond the international arena”.

Many domestic corporate practices in the United States and Europe are governed by different “voluntary codes” (Webb, 2004), “voluntary environmental agreements” (Brink, 2002), “certification regimes” (Haufler, 2003), “global standards” (Nadvi and Waltring, 2002), reporting guidelines and eco-labels. Regulations are targeted toward multinational Corporations but in many cases also affect smaller companies along the supply chain. The market-based regulatory mechanisms employed by many civil regulations are producer certification, product labeling, third-party auditing, and information disclosure (Vogel, 2008). Environmental codes have primarily emerged in forestry, energy, minerals, and mining, chemicals, and most recently, electronics.

More research has been published on the Forest Stewardship Council (FSC) and related forestry codes which almost concentrated in developed countries (Bernstein and Cashore, 2007; Clapp, 2005; Cashore, Auld and Newsom, 2004; Pattberg, 2006; Sasser et al., 2006) and only one in developing country, namely Argentina and Brazil (Espach, 2006). Relatively few studies, however, tackle the electronics industry code related issues of how and why they were established, and how and how well they are working in developing countries such as in Taiwan.

We proceed in the following analytical steps. First, we characterize the spatial division of labor within global production network in ICT industry and show that Taiwan's involvement in OEMs and ODMs has made it become the largest supply partners of the world's major ICT lead firms. Next, we demonstrate how NGOs-firms interplay through market's green supply chain mechanism in establishing rules, standards and authority that guide the behavior of the participants. We name it the non-state market-driven environmental governance.

## **2 、 Characteristics of Taiwanese ICT Industry : From Flexible to Global Production Network**



In 2007, Taiwan produced 92.8 per cent of the world's notebook PCs, more than 97 per cent of the motherboards, 70.2 per cent of the liquid crystal display monitors, 32.6 per cent of the desktop PCs, (Table 1) and over 75 per cent of the foundry ICs for the world market (MIC, 2008).

\*\*\*Table 1 about hear

The Taiwanese industrial structure before 1990s was dominated by the small and medium-sized enterprises (SMEs), which were also the main exporters. The competitiveness of Taiwan's SMEs relied primarily upon personal networks and trust relationships that resulting in the sharing of orders, production facilities, and personnel. Hamilton (1996) and Fields (1995) both claim that this network type of industrial structure strengthens the SMEs organizational flexibility and competitiveness in the world market. Taiwan's Personal Computer (PC) industry was initiated by SMEs, such as Acer and Mitac. Because of the weakness of the SMEs' R&D capability, one of the major ways that Taiwanese PC firms obtained and enhanced their technologies was by working closely with the global lead firms through the original equipment manufacturing (OEM) channel, a method involving firms manufacturing industrial goods for others without having their own brand, and

also via the original design manufacturing (ODM) path (Wu and Hsu, 2001; Wang, 2007). Owing to the increase in OEM orders in the mid-1980s, the leading Taiwanese PC firms began to establish their own production networks that involved huge numbers of SMEs in the electronics industry (Wang and Lee, 2007).

The severe competition among the multinational Corporations (MNCs), especially in the IT industry such as Compaq, HP, and Dell, has created an important organizational innovation in the 1990s, in which MNCs have changed from “focusing on stand-alone overseas investment projects to ‘global network flagships’ that integrate their dispersed supply, knowledge and customers bases into global production networks (GPN)” (Ernst and Kim, 2002:1418; Wang and Lee, 2007). The global network flagship has outsourced all but R&D and marketing to key contractual suppliers in Taiwan. The key contractual supplier has to develop new organizational competence and technological capability to fulfill the demands, for example quality, volume, speed and flexibility, from the flagship firm. In turn, the lower-end suppliers with large numbers of SMEs located mainly in China and Taiwan, which focus on improvements in relation to specialization, productivity and linkages, have to accomplish the demands of the key contractual suppliers in Taiwan (Wang and Lee, 2007). Accordingly, the MNCs flagships, key contractual suppliers in Taiwan and the



latter's smaller SMEs suppliers in China, Taiwan and other places in the world constitute the spatial division of labor within global production network in ICT industry. Among others Taiwan's involvement in OEMs and ODMs has made it become the largest supply partners of the world's major ICT lead firms (Yu and Hsu, 2006).

### **3 · The Role the Greenpeace plays**

Students of NGO politics stay on examining how NGOs influence government policymaking processes. Recent works have begun to ask questions about how NGO activity influences actors other than states or inter-governmental regimes. NGOs seek to put pressure on firms via direct targeting, indirect targeting (generalized campaigns against all firms, or a large group of firms, within the same industry) and supply chain targeting (campaigns designed to bring pressure to bear on a firm based on tactics aimed at a firm's producers or consumers; usually such campaigns focus on retailers or big name manufacturers at the downstream end of the supply chain) (Sasser et al., 2006). Direct targeting seems most likely to drive firms toward joining the NGO-preferred program. Moreover, NGO advocacy strategies are rooted in the moral legitimacy and trust these groups enjoy among the public (Price, 2003), which they

are able to leverage in their battle against industry. When confronted with NGOs' moral authority, firms are anxious to protect their reputation. Failure to do so can lead to an erosion of moral legitimacy which imposes significant costs—including reduced profitability or market share—on firms (Sonnenfeld and Mol, 2002; Sasser et al., 2006).

In our case, Greenpeace uses “green electronics campaign” and makes three demands. Makers of electronics goods should: clean up their products by eliminating hazardous substances ; take back and recycle their products responsibly once they become obsolete ; and improve their corporate policies and practices with respect to Climate and Energy<sup>1</sup>. These demands are quite similar to and correspond with European Union's three environmental directives: the Restriction of Hazardous Substances (RoHS), Waste Electrical and Electronic Equipment (WEEE), and Eco-design for Energy using Products (EuP).

Greenpeace activists first demonstrate against e-waste outside the Hewlett Packard (HP) Beijing headquarters on 07 December 2005. Greenpeace has conducted nine surveys and ranked 17 electronics brands on how green it believes they are since 2006 (Knight, 2009). Dell has become the latest company to promise to remove the

<sup>1</sup> <http://www.greenpeace.org/electronics>

worst toxic chemicals from its products, closely following the move of its rival HP.

Both companies have been pressured by Greenpeace to make their products greener and help tackle the growing mountain of toxic e-waste<sup>2</sup>. Dell made the announcement with a pledge to phase out the use of two key groups of chemicals known to be hazardous to the environment: all types of brominated flame retardants (BFRs) and the plastic polyvinyl chloride (PVC), by 2009. HP, LGE, Nokia, Samsung, Sony and Sony Ericsson have already made commitments to eliminate the use of BFR's and PVC in the near future. However, a number of other companies including Acer, Apple, Fujitsu-Siemens, IBM, Lenovo, Panasonic, Siemens and Toshiba have so far failed to commit to similar measures. Motorola recently broke its promise to clean up. According to "Guide to Greener Electronics", version 11, published on March 2009, PC manufactures HP, Lenovo and Dell have been served a penalty point for backtracking on their commitment to eliminate PVC and BFRs from their products by the end of 2008<sup>3</sup>. One Ethical Corporation magazine observer watches carefully that "the designers and executives are, however, genuinely sympathetic to most of the Greenpeace campaign's demands – they quibble more with the timing than the substance" (Knight 2009).

<sup>2</sup> <http://www.greenpeace.org/international/news/dellremovestoxicschemicals260606>

<sup>3</sup> <http://www.greenpeace.org/electronics>

Knight (2009) argues that Greenpeace's well-researched, highly-targeted and dogged campaigning provides the essential armaments needed by executives to drive the agenda of change within their companies. Moreover, Greenpeace campaigners have constituencies that provide them with the support (moral and financial) to run their operations. Those constituencies can influence markets and the brighter executives respect that power (Knight, 2009). As a result, global lead firms HP, Dell, Sony and Acer transmit their pressure into the key contractual suppliers in Taiwan to require the latter to comply with the demands from the former, Greenpeace, EU and other countries' environmental directives.

#### **4 、 Non-State Market-Driven Environmental Governance in Taiwan's ICT**

##### **Industry**

According to the US-AEP (1999), the information and electronics industry dominates the global markets and shifts towards a technologically-advanced economy, and this is a heavy pollution industry. As previous section mentioned, Taiwan plays a very important role in the production and outsourcing for the OEMs and ODMs in the global supply chain system of the ICT industry. These industries are subjected to customer requests for green products and green manufacturing that comply with EU directives. According to Taiwan's Customs statistics, more than 30,000 of electrical

and electronics manufactures with US\$7,8billion of total production value that were affected by EU's RoHS and WEEE directives in 2005 (TEEMA, 2006). Moreover, the infamous Sony PlayStation incident in 2001 that cost the company nearly 1.3 million of its best-selling PlayStation game consoles were stopped at the Dutch border because unsafe levels of cadmium were detected in the cables of the consoles (Carlton, 2006). Confronted with such severe environmental regulatory threats and intense scrutiny from environmental activists, leading ICT industry companies including Dell, HP, IBM, Motorola, Sony, Panasonic, NEC, Fujitsu, and Toshiba have adopted green supply chain management as a proactive strategy capable of complying with the legislative requirements, enhancing environmental and financial performance and maintaining the competitive advantage in the world market (Zhu and Sakis, 2006). EU directives also have a far-reaching effect on supply chain partners for global ICT lead firms (Huang, 2005).

#### **4.1 Global ICT Lead Firms' Green Supply Chain Management**

In order to closely monitor and manage chemical substances used in its products at all stages of the manufacturing cycle, Sony is committed to manufacturing environmental products in compliance with the SS-00259 and contributing towards

the protection of the global environment and ecosystems. The SS-00259 defines "controlled substances" that have a significant impact on the global environment and may harm human health. It aims to ban or phase out the use of these substances in the process of design, manufacture, and distribution of products. When signing a deal with new suppliers, Sony inspects them to verify that they meet Sony environmental standards. Suppliers are required to qualify as Green Partners through an audit based on the "Sony Green Partner Environmental Quality Approval Program".<sup>4</sup> Suppliers need to provide supporting evidence such as Certificate of Non-Use of Environment-Related Substances to be Controlled (for the parts approval evaluation), Measurement Data by ICP-AES, and a List of Constituent Substances (or Materials Safer Data Sheet, MSDS) to ensure that their management system functions well.<sup>5</sup>

As the world's largest information technology company, HP was the first electronics company to publish a Social and Environmental Responsibility Supplier Code of Conduct in 2002. In 2004, it helped lead the development of the Electronic Industry Code of Conduct. The EICC fosters responsible management and operational practices in labor, human rights, ethic, the environment, health and safety across the

<sup>4</sup> <http://www.sony.net/SonyInfo/procurementinfo/green.html>

<sup>5</sup> The Certificate is a document that warrants that there are no substances banned for use stipulated in SS-00259 included in the parts, devices, and raw materials produced by a supplier. Measurement Data by ICP-AES, is a measure of the content and proves that there is no cadmium and lead in the plastic and that four heavy metals (cadmium, lead, mercury and hexavalent chromium) are not contained in packaging materials used for Sony products. The List of Constituent Substances provides information about other constituent substances. <http://www.sony.net/SonyInfo/procurementinfo/green.html>

electronics industry's global supply chain. In addition to the EICC, HP suppliers must comply with its General Specification for the Environment (GSE), which contains HP's global product content requirements for restricting or prohibiting certain chemical compounds or materials in HP products or manufacturing processes.<sup>6</sup> Moreover, HP employs four phases of social and environmental responsibility (SER) program to promote continual improvement in supplier companies, that is introduction, assessment, validation and continual improvement. First, there are social and environmental conformance clauses in the procurement contracts. HP requires its first-tier suppliers (those with whom HP has a direct contractual relationship) to execute a Social and Environmental Responsibility Agreement a top priority in order to drive supplier performance contractually. These suppliers then select and manage their own suppliers, also known as second-tier suppliers or subcontractors. Second, HP asks suppliers with factories being classified as high-risk to complete a self-assessment questionnaire to pinpoint potential social and environmental responsibility performance risks. Self-assessment helps suppliers become more familiar with HP's expectations of what it means to conform to the Electronic Industry Code of Conduct. Third, baseline auditing remains a critical part of the overall supplier engagement process. HP employs three types of audits to assess

<sup>6</sup> [http://www.hp.com/hpinfo/globalcitizenship/supplychain/ser\\_program.html](http://www.hp.com/hpinfo/globalcitizenship/supplychain/ser_program.html)

conformance with the EICC: audits conducted by HP employees, by an external organization to verify the results of HP-conducted audits, and EICC joint audits conducted by an external organization on behalf of HP and other EICC-member customer companies. The audit team monitors suppliers' progress closely to ensure that the latter resolves all major non-conformances within the specified time. Finally, HP believes that remaining engaged with and providing support and tools to its suppliers is the best way to help improve the latter's performance.<sup>7</sup>

To meet international expectation and demand for environmental protection, two global lead firms in Taiwan, ACER and ASUS, have already implemented GSCM practices. ACER, for instance, has set up a green product supply chain management system, containing green product specification, green products compliance data, an auditing management mechanism, and a green procurement system (ACER, 2005; Chien and Shih, 2007). ASUS, other than meeting the demands of its clients, has also taken initiatives to understand the difficulties faced by its suppliers and provide them with necessary information and services. ASUS also support their suppliers with ASUS e-Green for registration and evaluation to ensure the capability of suppliers through the mechanism of a part approval process. (Chien and Shih, 2007). Finally, the company has created an auditing mechanism for the green management system to

<sup>7</sup> [http://www.hp.com/hpinfo/globalcitizenship/supplychain/ser\\_program.html](http://www.hp.com/hpinfo/globalcitizenship/supplychain/ser_program.html)



guarantee that their suppliers conform to green management, hence establishing incentive and elimination mechanisms for green procurement (ASUS, 2005; Chien and Shih, 2007).

#### **4.2 Global Buyer--Local Supplier Networks in ICT industry in Taiwan**

Two critical factors can be identified that are influential in the development of environmental management capabilities of local SMEs suppliers in Taiwan. One is support-based GSCM and the other external available resources. First, GSCM can be defined as a buying (global lead firm) organization's plans and activities that integrate environmental issues into supply chain management in order to improve the environmental performance of suppliers and customers (Handfield et al., 2005). Support-based GSCM involves the direct interaction of the buying firm with its suppliers to improve supplier environmental performance and /or jointly develop environmental solutions (Lee and Klassen, 2008). Some of these activities include providing training and education programs to suppliers, sponsoring environmental forum for suppliers to encourage the sharing of information and experience. Recent Acer Corporate Social Responsibility (CSR) Forum 2008 in Taiwan, initiating by the Taiwan Business Council for Sustainable Development (BCSD) to hold a discourse

about global challenges for Taiwanese ICT industry to the sustainable development, provided a case in point. The BCSD enters into alliance with several global NGOs, such as Greenpeace, Electronic Industry Citizenship Coalition (EICC), The Center for Research on Multinational Corporations (SOMO), and Asia Sustainable and Responsible Investment Association (ASrIA), to propose different environmental policy advocacies including Climate Savers Computing initiative (CSCI) and Carbon Disclosure Project. The BCSD also invited American and Japanese big ICT lead firms to present their way of carrying out green procurement method.

Current Carbon Disclosure Forum 2009 and Carbon Inventory and Management Workshop this April in Taiwan, sponsored by ACER Foundation, invites TSMC, AUO and ACER to share experience with local suppliers concerning about how to respond to CDP questionnaire. Both support-based GSCM and CSR and CDP forum tend to focus not only on the building of suppliers' potential and capacity, but also on the improving of buyer-supplier relations increasingly involve attention to integration, partnership and collaboration.

Second, as a large proportion of local SMEs suppliers in Taiwan being short of information, know-how, and financial resources to deal with emerging environmental



issues, supporting organizations outside the supply chain can be critical external resources that SMEs suppliers can access and utilize for improvement of their environmental capability. These organizations include BCSD, British Standards Institution Taiwan, Corporate Synergy Development Center, Electric-Electronic & Environmental Technology Development Association of R.O.C., Industrial Technology Research Institute of Taiwan (ITRI), Plastics Industry Development Center (PIDC), SGS Taiwan, Electronics Testing Center Taiwan, and TUV Rheinland Taiwan. They can provide proper and timely support for training and education programs and offer inspection, verification, testing, certification, and technical consultancy of environmental services to SMEs suppliers that need resources for improving their environmental capabilities.

Moreover, in order for local SMEs suppliers to be qualified as a supplier, key contractual suppliers in Taiwan would require the former to provide raw materials RoHS conformance inspection report from a third party such as SGS Taiwan. If local suppliers cannot provide such evidence, then they should sign in a self-declaration or a contract to pay the full liability once raw materials fail to pass the inspection. Key contractual suppliers can give suitable technical consultancy and select some excellent qualified suppliers to be the benchmarking to force other suppliers to follow. In

addition, local suppliers need to show the bill of materials (BOM) table so that key contractual suppliers can monitor. Key contractual suppliers conduct audits regularly to assess local suppliers' conformance with environmental regulations (Li, 2007).

One study conducted by PIDC, namely the Impact of EU Directives upon Domestic Electric and Electronics Firms in Taiwan<sup>8</sup>, emphasized that 81.5 per cent of European buyers require that products export to EU market should comply with its environmental directives such as RoHS and WEEE. In addition, 44.5 per cent of component suppliers responded that they had been affected by the follow-up directives including EuP (Energy Using Product Directives 2005/32/EC), 28 per cent affected by REACH (Registration Evaluation & Authorization of Chemicals), and 25 per cent by GHG (Green House Gas). The listings that SMEs suppliers needed in assistance most are product test and certification programs (36.2%), followed by education and training services (31.7%), technical consultancy services (26.6%), and R&D of green material technology services (21.1%). When asked about what demands most from key contractual suppliers, local SMEs suppliers replied that quality inspection management came first (72.5%), with green manufacturing management next (53.2%), followed by green procurement management (51.4%),

<sup>8</sup> Data comes from "Plastic Industry Development Center, 2007. *SMEs and Green Supply Chain*. Taichung: Plastic Industry Development Center".

green design management (37.6%), and ISO14000 document management (34.9%).

Concerning about the content of authorization documents for monitoring and verification purpose, key contractual suppliers would like to ask for local SMEs suppliers to provide mainly the components inspection report first (82.4%), with suppliers' improvement countermeasure the second (77.8%), processing upgrading countermeasure came next (74.1%), and finally product components items declaration (74.1%). The PIDC's study also found that the percentage that did not conform with EU's directives for local SMEs suppliers for instance printing firms, metal processing firms, and thermal management solution firms was higher than those of key contractual suppliers'. As we mentioned before, PIDC is just one of the many supporting organizations served to strengthen suppliers' environmental capability in Taiwan. We argue that these supporting organizations, plus key contractual and SMEs suppliers constitute local production networks to exchange mutual environmental resources and through learning to improve environmental performance.

#### **4.3 Authority Granted Through a Green Supply Chain**

Non-state market-driven (NSMD) governance systems that recognize and track the market's supply chain of responsibly produced goods and services have become a

fact in ICT industry recently. The growth in the number of such codes, for example HP' supplier social and environmental responsibility (SER) program and EICC, Sony's green partner environmental quality approval program, and ASER and ASUS green supply chain management, have proliferated. Under NSMD, the location of authority is based on market transactions occurring through the production, processing, and consumption of economic goods and services. The green supply chain directs and shapes political struggles among Greenpeace, global lead firms, key contractual suppliers and local SMEs suppliers in Taiwan's ICT industry. At each stage of the economic production chain, be it first-tier or second tier contract, economic actors make choices as to whether they support and are willing to operate under the rules and the procedures of the NSMD governance system (Cashore, 2002). The green supply chain mechanism is through using inspection, testing, certification and verification to the first-tier and second-tier suppliers. Verification is important "because it provides a validation necessary for legitimacy to occur, and to distinguish products to be consumed in the marketplace" (Cashore, 2002). Suppliers that meet specific standards are awarded certifications, which mean that these products have been produced responsibly. Vogel (2008:271) argues that "social certifications benefit firms that sell to consumers by improving their reputations and protecting their markets, and they benefit developing country suppliers by maintaining or increasing

their global market access”.

## 5 、 Conclusion

This article has focused on the important step of presenting a framework for analyzing the emergence of non-state market-driven governance systems. First, we characterize the spatial division of labor within global production network in ICT industry and show that Taiwan's involvement in OEMs and ODMs has made it become the largest supply partners of the world's major ICT lead firms. Next, we demonstrate how NGOs-firms interplay through market's green supply chain mechanism in establishing rules, standards and authority that guide the behavior of the participants. We offer evidence to show that authority is granted through a global lead firm's internal evaluative process using inspection, testing, certification and verification to the first-tier and second-tier suppliers down the chain. As state does not use its sovereign authority to directly require adherence to rules, we would like to emphasize that such private environmental governance is “governance without government”.

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Table 1: Production of Taiwanese ICT Industries (2007)

	Production Value (\$M)	Production Volume(thousands)	Global Market Share	Global Ranking
Notebook Computer	48187	90165	92.8%	1
Desktop Computer	13014	46055	32.6%	2
Mother Board	7644	149097	97.2%	1
Server System	2376 (total)	2950	35.20%	2
Server Mother Board		4358	52.6%	1
Computer Monitor	19229 (LCD)	123619	70.2%	1
	571 (CDT)			
CD-ROMs	2193	88671	29.0%	2
Digital Camera	3750	49896	42.2%	2

Sources: MIC, 2008



## Reference

- ASER, Inc. 2005. *Corporate Environmental Report*. Taipei, Taiwan.
- ASUS, ASUSTek Compute Inc. 2005. *Social Environment Responsibility Report*. Taipei, Taiwan.
- Bartley, T. 2003. Certifying forests and factories: state, social movements, and the rise of private regulation in the apparel and forest products fields. *Political Sociology* 31(3):453-64.
- Bartley T. 2007. Institutional emergence in an era of globalization: the rise of transnational private regulation of labor and environmental conditions. *American Journal of Sociology* 113(2):297-351.
- Bernstein, Steven. 2001. *The Compromise of Liberal Environmentalism*. New York: Columbia University Press.
- Bernstein, S. 2005. Legitimacy in global environmental governance. *J.Int. Law Relat.* 1(12):139-66.
- Bernstein, S, Cashore B.2007. Can non-state global governance be legitimate? An analytical framework. *Regulation & Governance* 1(4):347-71.
- Brink, P. 2002. *Voluntary Environmental Agreements: Process, Practice and Future Use*. 10<sup>th</sup> ed., Sheffield: Greenleaf Publishing.
- Bruce, Robert A. 1998. The Comparison of the FSC Forest Certification and ISP Environment Management Schemes and Their Impact on a Small Retail Business. Master's in Business Administration thesis, University of Edinburgh Management School, University of Edinburgh.
- Carlton, J. 2006. EU's environmental hurdles for electronics: rules to require mitigation of toxic materials that are common in many products. *Wall Street Journal* June 29, B5.
- Cashore, Benjamin, and Ilan Vertinsky. 2000. Policy Network and Firm Behaviours: Governance Systems and Firm Responses to External Demands for Sustainable Forest Management. *Policy Science* 33:1-30.
- Cashore, Benjamin 2002. Legitimacy and the privatization of environmental governance: How non-state market-driven (NSMD) governance systems gain rule-making authority. *Governance* 15(4): 503-529.
- Cashore, B, Auld G, Newsom D. 2004. *Governing Through Markets: Forest Certification and the Emergence of Non-State Authority*. New Haven, CT: Yale University Press.
- Cashore, Benjamin, Graeme Auld, and Deanna Newsom. 2001. Forest Certification (Ecolabeling) Programs and Their Policy-Making Authority: Explaining Divergence among North American and European Case Studies. *Forest Policy and Economics*.

- Cashore, Benjamin, and Ilan Vertinsky, and Rachana Raizada. 2001. Firm Responses to External Pressures for Sustainable Forest Management in British Columbia and the U.S. Pacific Northwest. In D. Alper and D. Salazar, eds., *Sustaining the pacific coast Forest: Forging Truces in the War in the Woods*. Vancouver: University of British Columbia Press.
- Chien, M.K. and Shih, L.H. 2007. An empirical study of the implementation of green supply chain management practices in the electrical and electronic industry and their relation to organizational performances. *International Journal of Environmental Science and Technology* 4(3):383-394.
- Clapp, J. 1998. The privatization of global environmental governance: ISO 14000 and the developing world. *Global Governance* 4:295-316.
- Clapp, J. 2005. Environmental governance for corporate responsibility and accountability. *Global Environmental Politics* 5(3):23-34.
- Cohen, R, Rai S, eds. 2000. *Global Social Movements*. London: Athlone.
- Cutler, A., Haufler V., Porter P, eds. 1999. *Private Authority & International Affairs*. Albany: State University of New York Press.
- Cutler, A. 2006. Transnational business civilization, corporations, and the privatization of global governance. In *Global Corporate Power*, ed. C. May, pp. 199-227. Boulder, CO: Lynne Rienner.
- Doh, J., Teegen H, eds. 2003. *Globalization and NGOs: Transforming Business, Environment, and Society*. Westport, CT: Praeger.
- Domask, J. 2003. From boycotts to global partnerships: NGOs, the private sector, and the struggle to protect the world's forests. See Doh & Teegen, pp. 157-86.
- Ernst, D and Kim L. 2002. Global production networks, knowledge diffusion, and local capability formation. *Research Policy* 31:1417-1429.
- Espach, R. 2006. When is sustainable forestry sustainable? The Forest Stewardship Council in Argentina and Brazil. *Global Environmental Politics* 6(2):55-84.
- Esty, D, Winston A. 2006. *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage*. New Haven, CT: Yale Univ. Press.
- Falkner R. 2003. Private environmental governance and international relations: exploring the links. *Global Environmental Politics* 3(2):72-87.
- Field, K. 1995. *Enterprise and State in Korea and Taiwan*. Ithaca: Cornell University Press.
- Gereffi, Gary, Ronie Garcia-Johnson, and Erika Sasser. 2001. The NGO-Industrial Complex. *Foreign Policy* July/August:56-65.
- Hall, R, Biersteker T, eds. 2002. *The Emergence of Private Authority in Global Governance*. Cambridge, UK: Cambridge University Press.

- Hamilton, G. 1996. The theoretical significance of Asian business networks. in G. Hamilton (ed) *Asian Business Networks*. New York: Walter de Gruyter.
- Handfield, R., Sroufe, R. and Walton, S. 2005. Integrating environmental management and supply chain strategies. *Business Strategy and Environment* 14(11):1-19.
- Harrison, Kathryn. 1999. Talking with the Donkey: Cooperative Approaches to Environmental Protection. *Journal of Industrial Ecology* 2:51-72.
- Haufler, V. 1999. Self-regulation and business norms: Political risk, political activism. In A. Cutler et al.,(eds) *Private Authority & International Affairs*. Albany: State University of New York Press. pp. 199-223.
- Haufler, V. 2001. *A Public Role for the Private Sector: Industry Self- Regulation in a Global Economy*. Washington, DC: Carnegie Endowment for International Peace.
- Haufler, V. 2003. New forms of governance: certification regimes as social regulations of the global market. In E.E. Meidinger et al., (eds) *Social and Political Dimensions of Forest Certification*. Remagen: Verlag Kessel.
- Haufler, V. 2006. Global governance and the private sector. In *Global Corporate Power*, ed. C. May, pp. 95-105. Boulder, CO: Lynne Rienner.
- Huang, J. 2005. The ministry of economic affairs establishes a RoHS service corps to help the electrical and electronic industries build green supply chains. *Taiwan Cleaner Production Newsletter* 1(1):2-3.
- Jenkins, R. 2001. *Corporate Codes of Conduct: Self-Regulation in a Global Economy*. Geneva: United Nations Res. Inst. Soc. Dev.
- Jennings, P. Devereaux, and Paul A. Zandbergen. 1995. Ecologically Sustainable Organizations: An Institutional Approach. *Academy of Management Review* 20: 1015-1052.
- King, A. 2007. Corporation between corporations and environmental groups: a transaction cost perspective. *Academy of Management Review* 32(3):889-900.
- King, A, Lenox M. 2000. Industry self-regulation without sanctions: the chemical industry's Responsible Care program. *Academy of Management Journal* 43(6):698-716.
- Kirton ,J.J., Trebilcock M.J., eds. 2004. *Hard Choices, Soft Law: Voluntary Standards in Global Trade, Environment and Social Governance*. Burlington, VT: Ashgate.
- Knight, Peter T. 2009. Letter from America: Apple shines under green spotlight. *Ethical Corporation*, 6 January 2009.
- Lee, Su-Yol and Klassen, R.D. 2008. Drivers and enabler that foster environmental management capabilities in small-and-medium-sized suppliers in supply chains. *Production and Operations Management* 17(6):573-586.
- Lenox, M.,Nash J. 2003. Industry self-regulation and adverse selection: a comparison

- across four trade association programs. *Bus. Strategy Environ.* 12:343-56.
- Levy, D., Kaplan R. 2008. CSR and theories of global governance : strategic contestation in global issue areas. In *The Oxford Handbook of CSR*, ed. A Crane, D McWilliam, D Matten, J Moon, D Siegel. Oxford, UK: Oxford Univ. Press.
- Li, Chuan Hsien 2007. *A study of organization and K.M. process: Cases of green project teams in core factories of Taiwanese in electrical and electronics companies*. Master's of Graduate Institute of Technology and Innovation Management Thesis, National Chengchi University, Taipei.
- Lipschutz, Ronnie D. 2001. Why Is There No International Forestry Law? An Examination of International Forestry Regulation, Both Public and Private. *UCLA Journal of Environmental Law and Policy* 19:153-180.
- Lipschutz, Ronnie D, and Cathleen Fogel. 2002. "Regulation for the Rest of US": Global Civil Society and the Privatization of Transnational Regulation. In T. J. Biersteker, R. B. Hall, and C. N. Murphy, eds., *The Emergence of Private Authority in Global Governance*. Cambridge, UK: Cambridge University Press.
- Lipschutz R, Rowe J. 2005. *Globalization, Governmentality and Global Politics: Regulation For the Rest of Us?* London and New York: Routledge.
- Meidinger, Errol. 1997. Look Who's Making the Rules: International Environmental Standard Setting by Non-Governmental Organizations. *Human Ecology Review* 4:52-54.
- Meidinger, Errol. 1999. "Private" Environmental Regulation, Human Rights, and Community. *Buffalo Environmental Law Journal* 7:123-237.
- MIC (Market Intelligence Center). 2008. *Annual Report on Taiwan's Information Industry 2007*. Taipei:MIC. (in Chinese)
- Moffat, Andrea C. 1998. Forest Certification: An Examination of the Compatibility of the Canadian Standards Association and Forest Stewardship Council Systems in the Maritime Region. Master's of Environmental Studies thesis, Dalhousie University, Halifax.
- Morgenstern R, Pizer W, eds. 2007. *Reality Check: the Nature and Performance of Voluntary environmental Programs in the United States, Europe, and Japan*. Washington, DC: Resource Future.
- Morth, U., ed. 2004. *Soft Law in governance and regulation: An Interdisciplinary Analysis*. Northampton, MA: Edward Elgar.
- Nadvi, K. and Waltring F. 2002. *Making Sense of Global Standards*. Duisburg: INEF.
- Nash, J, Ehrenfeld J. 1997. Codes of environmental management practice: assessing their potential as a tool for change. *Annu. Rev. Energy Environ.* 22:487-535.
- Newell, P. 2000. Environmental NGOs and globalization: the governance of TNCs. In Cohen & Rai (eds) , *Global Social Movements*. London: Athlone. pp. 117-34.

- Oliver, Christine. 1991. Strategic Responses to Institutional Processes. *Academy of Management Review* 16:145-179.
- Pattberg, P. 2005. What role for private rule-making in global environmental governance? Analyzing the Forest Stewardship Council (FSC). *International Environmental Agreements* 5:175-89.
- Pattberg, P. 2006. The influence of global business regulation: beyond good corporate conduct. *Business and Society Review* 111(3):241-86.
- Pattberg, P. 2007. *Private institutions and Global Governance: The New Politics of Environmental Sustainability*. Northampton, MA: Edward Elgar.
- Plastic Industry Development Center, 2007. *SMEs and Green Supply Chain*. Taichung: Plastic Industry Development Center.
- Porter, T, Ronit k. 2006. Self-regulation as policy process: the multiple and criss-crossing stages of private rule-making. *Policy Sciences* 39:41-72.
- Prakash, Assem. 2000. Responsible Care: An Assessment. *Business and Society* 39: 183-209.
- Prakash, A, Potoski M. 2006. *The Voluntary Environmentalists: Green Clubs, ISO 14001, and Voluntary Environmental Regulations*. Cambridge, UK: Cambridge University Press.
- Prakash, A, Potoski M. 2007. Investing up: FDI and the cross-national diffusion of ISO 14001. *International Studies Quarterly* 51(3):723-44.
- Price, R. 2003. Transnational Civil Society and Advocacy in World Politics. *World Politics* 55:579-606.
- Rondinelli, D., London T. 2003. How corporations and environmental groups cooperate: assessing cross-sector alliance and collaborations. *Academy of Management Executive* 17(1):61-76.
- Rosenbaum, Walter A. 1995. *Environmental Politics and Policy*. Third ed. Washington: CQ Press.
- Ruggie J. 2007. Global markets and global governance: the prospects for convergence. *In Global Liberalism and Political Order: Toward a New Grand Compromise*, (eds) S. Bernstein, L. Pauly, pp. 23-50. New York: State University NY Press.
- Sasser, E, Prakash A, Cashore B, Auld G. 2006. Direct targeting as an NGO strategy: examining private authority regimes in the forestry sector. *Business and Politics* 8(3):1-32.
- Scherer, A, Palazzo G, Baumann D. 2006. Global rules and private actors: toward a new role for the transnational corporation. *Business Ethics Quarterly* 16(4):505-32.
- Sonnenfeld, David A. and Arthur A.J. Mol 2002. Ecological Modernization, Governance, and Globalization. *The American Behavioral Scientist*



- 45(9):1456-1461.
- Suchman, Mark C. 1995. Managing Legitimacy: Strategic and Institutional Approaches. *Academy of Management Review* 20:571-610.
- Tarrow, S. 2005. *The New Transnational Activism*. Cambridge, UK: Cambridge University Press.
- TEEMA, Taiwan Electrical and Electronic manufacturers' Association, April 20, 2006, Related to industrial standard in green products. Retrieved April 15, 2009, from TEEMA web site: <http://www.teema.org.tw/events/moreinfo.asp?autono=2930>
- Tollefson, Chris, ed. 1998. *The Wealth of Forests: Markets, Regulation, and Sustainable Forestry*. Vancouver: UBC Press.
- US-AEP 1999. Supply chain environmental management-Lessons for leaders in the electronics industry[electronic version], Clean Technology Environmental Management(CTEM)program, US-Asia Environmental partnership, pp1-84.
- Vogel, D. 1995. *Trading Up: Consumer and Environmental Regulation in a Global Economy*. Cambridge, MA: Harvard University Press.
- Vogel, D. 2005. *The Market for Virtue: The Potential and Limit of Corporate Social Responsibility* Washington, DC: Brookings Institutions.
- Vogel, D. 2008. Private global business regulation. *Annual Review of Political Science* 11:261-282.
- Wang, J.H. 2007. From technological catch-up to innovation-based economic growth: South Korea and Taiwan compared. *The Journal of Development Studies* 43(6): 1084-1104.
- Wang, J.H. and Lee C.K. 2007. Global production networks and local institutional building: The development of the information technology industry in Suzhou, China. *Environment and Planning A* 39(8): 1873-1888.
- Webb, K. 2004. Understanding the voluntary codes phenomenon. In K. Webb (ed) *Voluntary codes: Private Governance, the Public Interest and Innovation*, Ottawa: Carleton University Press. pp.1-31.
- Wells, D. 2007. Too weak for the job: corporate codes of conduct, non-governmental organization and the regulation of international labour standards. *Global Social Policy* 7:51-73.
- Wu, S.H. and Hsu F.B. 2001. Towards a knowledge-based view of OEM relationship building: sharing of industrial experiences in Taiwan. *International Journal of Technology Management* 22(5/6):503-523.
- Yu, C.H. and T.C. Hsu 2006. The conceptual construction of core competence for two distinct corporations in Taiwan. *Journal of American Academy of Business* 8(1):197-201.
- Zietsma, Charlene, and Ilan B. Vertinsky. 1999-2001. Shades of Green: Cognitive

Framing and the Dynamics of Corporate Environmental Response. *Journal of Business Administration and Policy Analysis* 27-29:217-247.31

Zhu, Q. and Sarkis J. 2006. An inter-sectoral comparison of green supply chain management in China: Drivers and practices, *Journal of Cleaner Production* 14:472-486.

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