Investment, Trade, and Environment

1 The relationship among investment, trade, and the environment: our framework of analysis

1.1 Background

China has achieved much in the 30 years that have passed since the onset of major reforms. In 2010, China became the second largest economy in the world as its gross domestic product (GDP) soared to USD 5.9 trillion. That figure has been growing at a rate of 10% per year. At the same time, though, China's per capita GDP was only USD 4,382 in 2010, 95th in the world. The accelerated development of the Chinese economy, coupled with the intensity and speed of its reform process, has allowed international investment and trade to become important means towards promoting the development of the country. At the same time, they have facilitated China's involvement in economic globalization. By the end of 2009, China had approved over 660,000 foreign investments totaling USD 997.4 billion, the highest cumulative figure among developing countries over a 17-year period. Even in 2008 and 2009, when the world was swept by the financial crisis, the size of foreign direct investment in China dropped only slightly. China's FDI in 2009 was USD 230 billion, seven times over 2003 levels when the "going global" strategy was launched. The total import and export volume in China's foreign trade in 2009 amounted to USD 2.2 trillion, including an

Recommendation: China needs to take proactive positions regarding environment and development that will: (1) ensure that those investing within China operate at the highest standards of CSR; (2) secure goodwill and the right to operate in countries abroad for Chinese ventures, based on the quality and style of investment and benefits for local people; and (3) seek bilateral, regional, and international trade, environment, and other agreements that take into account Chinese interests and concerns for a green economy, and indeed, for the transition to ecological civilization. China should aim to be an open and declared advocate in developing and promoting international green transformation.

See Seetion 6 for more discussion about this recommendation.

export volume of USD 1.2 trillion (equivalent to 10% of global trade export volume). Such an amount of exports placed it first among exporting nations, even ahead of traditional exporters like Germany. At the same time, it imported USD 1.0 trillion, achieving a trade surplus of USD 196 billion.

With globalization and increasingly serious global environmental problems, sustainable development and human survival itself have been confronted with increasingly stringent challenges. Problems such as pollution, climate change, and energy shortages are now at the forefront worldwide. Traditional energy-consumption and industrial-development patterns are no longer viable. As the role of international investment and trade becomes more important, the analysis of the investment, trade, and environment nexus also becomes imperative.

Because of their nature, investment and trade interact with each other and impact the environment in similar ways. The relationships are multi-dimensional and very complex. Trade can have positive impacts on the environment, but it can—and often does—also lead to environmental degradation. The difference lies in how well established the governance rules are around trade. The same applies to FDI: on the one hand, it may increase the host country's pollution levels when it flows from countries or regions with strict environmental regulations to countries or regions with more lenient environmental regulation, thus causing the transfer of polluting industries and increasing the level of pollution in the host country; on the other hand, the advanced technologies brought by FDI to the host country may often improve the efficiency and recycling of resources, thereby leading to reduced emissions and pollution in the host country.

With expanding globalization, investment and trade will often overlap and interact as cause and effect. Trade-oriented investments are closely related to the target resources and market strategies of a host country. While investment in a coal-mining operation can be made with the highest regard for social and environmental conditions, the actual commodity, when traded, will transfer pollution. The analysis of the interaction of investment, trade, and environment is just starting, but it is clear that international investment and trade are connected at multiple points in the industrial and consumption value chains. They interact with resource supply, production efficiency, emission levels, market share, consumption options, and related emission levels. They are crucial to the energy security and to development, and are therefore very influential in defining their status and importance.

1.2 Environmental impacts of international trade

The impact of international trade on the environment and society is comprehensively

reflected through *scale, structure*, and *technology* effects. The scale effect means that larger-scale trade activities lead to more serious environmental degradation; the structure effect means that the in-depth development of trade activities promotes the upgrading and restructuring of industrial structures, thus exerting positive impacts on the environment; and the technology effect means that the specialized professional division of labor, advanced technology, and management experience introduced through trade, cause the reduction of pollutant per unit of output, thereby gradually improving environmental quality.

The environmental impact of international trade can also be viewed from the long- and short-term consequences it brings. In the long term, environmental pollution caused by international trade takes on the inverted U form; in the short term, as trading rivals are at different stages of development, the three effects—technology, structure and scale—are reciprocal and the impact of international trade on the environment and social development differs for each party. These effects are further expanded into several other hypotheses, such as the "Environmental Kuznets Curve (EKC)" hypothesis; the "race to the bottom" hypothesis; and the "pollution haven" hypothesis.

China and other developing countries have entered a critical period of industrialization and global green shift, generating much debate about the impact of international trade on the environment. Some have said that China is practicing "neo-colonialism," robbing resources, occupying markets, and slowing global progress towards sustainable development. Others claim that China uses developing countries in Africa and Southeast Asia as "pollution havens" to transfer emissions by taking advantage of the lower local environmental standards and loose enforcement conditions. This causes host countries to "race to the bottom" as they lessen environmental standards to attract foreign investment; it's a process that stifles sustainable development in the host country and, indeed, globally.

Whether true or not, such accusations are often expressed by more developed countries that are competing for markets and resources with China and are disturbed by its rising influence and appetite. Whatever the case, the social and environmental issues that are revealed are certainly worth closer examination. In a context of growing international globalization and trade liberalization, it is likely that the traditional laws of economics seeking optimization of resources will stimulate the transfers of industries among countries at varying technological levels and developmental stages. Research shows that industrial transfer has indeed occurred in international economic and trade development in the past, but hypotheses such as "pollution haven" and "race to the bottom" do not always hold true.

Indeed, industrial transfer can be the result of rising domestic production costs related to the adoption of stricter pollution standards in a developed country. Such industrialized

countries have, through imports and investments, transferred pollution-intensive and resource- and energy-intensive industries to other countries, giving rise to the effect of "pollution havens." H.D. Robinson① revealed that the United States tended to import more pollution-intensive products, thereby replacing the domestic pollution-intensive industries in the exporting country. Mani and Wheeler② discovered that the output ratio of polluting and clean industries in OECD countries is continuously dropping, while the import-export ratio of polluting industries is rising year by year; on the other side of the coin, the output ratio of polluting and clean industries of developing countries in Latin America and Asia is gradually increasing, while the import-export ratio of polluting industries is dropping. Low and Yeats③ have pointed out that in the course of global industrial transfer, as developed countries trade with developing countries, the concentration of pollution intensity in developing countries is higher.

Industrial transfer will not necessarily have only negative impacts on the environment and society of the host country. The scale effect might aggravate environmental deterioration. However, when the change in product structure is a shift from pollution-intensive to cleaner products, or clean production technology is adopted, environmental conditions will be improved after trade is liberalized. When income reaches a certain level, and when the promoting role of the technology effect and the structure effect is prevailing, the environmental and social impact of international trade could be positive.

Certainly when the scale effect prevails in trade, its impact can be quite negative. The air pollution level of countries like China, Mexico, and Brazil has worsened while they are all "going global"④. In countries with low environmental-protection standards and weak law enforcement, international trade exerts huge competitive pressure on the host country. Indeed, tremendous environmental and social problems prevail in those cases⑤,⑥,⑦. The environmental and social impacts of international investment and trade vary from case to

① Robinson, H. D. (1988). "International Pollution Abatement: The Impact on the Balance of Trade." Canadian Journal of Economics, 21, pp.187-199.

② Mani, M., Wheeler, D. (1998). In search of pollution havens? Dirty industry in the world economy: 1960–1995. Journal of Environment and Development 7(3): 215–247.

③ Low P. and A. Yeats (1992). Do "Dirty" Industries Migrate? World Bank Discussion Papers.

④ D.Wheeler. Racing to the Bottom? Foreign investment and air pollution in developing countries [J]. Journal of Environment and Development, 2001, 10 (3):225-245.

⑤ D.Wheeler. Racing to the Bottom? Foreign investment and air pollution in developing countries [J]. Journal of Environment and Development, 2001, 10 (3):225-245.

⑥ Daniel C. Esty and Damien Geradin (1997). Market Access, Competitiveness, and Harmonization: Environmental Protection in Regional Trade Agreements. Harv. Envtl. L. Rev. 21.

⑦ Daniel C. Esty and Damien Geradin (1997). Market Access, Competitiveness, and Harmonization: Environmental Protection in Regional Trade Agreements. Harv. Envtl. L. Rev. 21.

case, and each example should be studied on its own terms.

Whatever the case, developing countries need in general to engage in a green shift and adopt strict environmental regulations governing their international trade. In some countries, there is a cause-and-effect relationship between strict environmental regulation and improved international competitiveness. Environmental regulations often increase the costs of production at first, but usually they will ultimately benefit the progress of business due to the gains in efficiencies, reduced waste, better safety and quality, and lower energy consumption.

1.3 Environmental impacts of international investment

The impacts of international investment and international trade on the environment and society can be quite similar. Large-scale international trade has promoted the transnational transfer of industries, thereby creating a new context for international investment. This, in turn, opens up a country's overseas resources and market space, and supports domestic economic development. In fact, international investment is more direct and complicated than international trade in terms of its environmental and social impacts. The academic circles have classified social and environmental impacts of international investment as follows: the halo effect, the regulation effect, the scale effect, the structure effect, and the technology effect. Each effect is a double-edged sword—in other words; it can be simultaneously good and bad for the host country's environment. Likewise, different investment subjects can also cause different environmental consequences. These cases are described in Table 1.

Table 1 Effects of International Investment

Definition of effect	Positive effects	Negative effects
Halo effect Foreign-invested enterprises that adopt more environmentally-friendly behaviours and use better environmental technologies than the host country.	① Promotes the economic restructuring of the host country. ② Enhances the public's environmental awareness.	Risks concealing the double standard.
Regulation effect "Investment-attracting" behaviour of the host government seeking FDI with strong environmental and CSR values.	Well-funded foreign enterprises can enhance the regional economy when environmental regulations pose challenges.	Increases pollution and emissions in regions with loose environmental regulations.

Definition of effect	Positive effects	Negative effects
Scale effect Impact on the environment when FDI expands the scope of business activities in the host country.	① Foreign-funded enterprises that value sustainable development bring advanced environment and development concepts, consistent with a society's desire to strengthen environmental protection. ② Introducing transnational corporations with excellent abilities and perspectives on management and sustainable development helps host countries accelerate their own transitions.	In the event of rapid growth or significant decline, many medium and small foreign-funded enterprises will have trouble keeping up with the obligations in environmental regulations.
Structure effect Changes taking place in different departments of the host country caused by FDI, thereby changing the economic structure.	Depending on existing levels of pollution in the host country, foreign investment can inspire upgrades to a host country's industrial structure.	① It could become increasingly difficult to control pollution due to an imbalance of investment in different industries and regions. ② Foreign investment in China is mainly composed of small and medium enterprises, and the positive scale effect is lessened.
Technology effect The phenomenon that foreign investment increases the rate of technology upgrading, dissemination, and transfer.	① Transnational corporations with advanced technologies promote the deployment of environmental protection technologies. ② The entry of transnational corporations with advanced technologies helps improve technology at the host country's own enterprises.	

1.4 Main Contents of Research

China's economic development has entered a critical period of green shift. This is occurring while the world is undergoing a severe economic crisis, which can lead to new investment opportunities as development gaps can be resolved through new and more sustainable solutions. This can be an important period for China and other developing countries to explore strategic and unprecedented opportunities.

Green shift is a comprehensive concept that encompasses a low-carbon, environmentally-friendly, recycling economy. China's Twelfth Five-Year Plan has pointed out that the country's green shift represents the evolution from an unbalanced, uncoordinated, and unsustainable economic development pattern, to a more balanced, coordinated, and

sustainable approach. At the same time, the green shift aims to reduce and eliminate the resource and environmental constraints of economic growth. It marks a transition from the traditional economic development pattern to a more intensive one. Investment, trade, and the environment are of critical importance in realizing the green shift to a balanced, coordinated, and sustainable economic development. Properly designed and utilized, trade and investment will drive and support the green shift; poorly designed, they could become a source of imbalance, chaos, and lack of sustainability.

China's rapid economic development poses serious environmental concerns. In 2010, China's carbon dioxide emissions were 8.33 billion Mt, accounting for 25% of the world's total — that's more than any other country[①,②]; the amount of primary energy consumption was 3.25 billion Mt of standard coal equivalent, with an average annual increase rate of 8.8%, ranking it number one in the world[③]. At the same time, China's fossil fuel resources are characterized by a lack of petroleum, small amounts of gas, and a wealth of coal. The currently estimated reserve and production ratio of petroleum is 11.3 years; natural gas, 32.3 years; and coal, 41 years. The proven reserves will increase, but not infinitely. Resource-intensive, energy-intensive, and pollution-intensive products comprise a very large proportion of China's exports. This reality has brought about a net loss to China's environment as a large amount of embedded carbon dioxide (CO_2) is transferred overseas through international trade. According to the Tyndall Centre for Climate Change Research (2007), the net export of embedded CO_2 in products traded by China is 1.1 billion Mt/year. A quarter of greenhouse gas emissions in China, including CO_2, are used for export. The current economic model in China, which exchanges resources for markets and environment for growth, must be reviewed. The drive towards a green shift should be actively and seriously pursued.

China's economic and trade cooperation with other developing countries is still in its infancy and can still be improved with regulations and other measures that support effective environmental stewardship. At this stage, China and other developing countries have the advantage of being relative late-comers to high levels of international trade and investment. Proper trade and investment approaches can not only promote China's green shift but also play an important and positive role in the green shift of host and partner countries. Effective

① Nina Chestney. China's CO_2 emissions rose 10 pct in 2010-BP data. LONDON, June 8, Reuters: http://in.reuters.com/article/2011/06/08/energy-bp-emissions-idINLDE75716Y20110608?feedType=RSS&feedName=everything&virtualBrandChannel=11709.

② BP Annual Statistical Review of World Energy 2011.

③ National Bureau of PRC. Statistical Bulletin of National Economy and Social Development in the Year 2010. Feb.28th, 2011.

environmental regulations relating to international investment and trade can become important drivers for a global green shift, a worldwide transition to sustainable development. Given the size of China's economy, its technological expertise, and the nature of the timing, China is in a position to lead on the issue.

The TF has focused on studying the green shift of FDI in China, China's ODI, and China's international trade, and CSR. The main questions affecting FDI in China are what sorts of investment should be encouraged and what policy measures should be adopted to ensure that FDI contributes to the green shift and sustainable development. As to ODI, the main question is about what policies China should develop to strengthen corporate social and environmental responsibility, improve the country's reputation, and enhance the image of China's overseas enterprises. In terms of international trade, the main questions are about what policies China should adopt to accelerate the shift to sustainable trade. In order to better understand these questions, the TF selected Indonesia, South Africa, and Zambia for first-hand examination. These were chosen based on locations where China's ODI and trade were more concentrated, and where the TF had access to local partner organizations and reliable local data.

Another important element of this research is to study how China should be involved in making and adapting international rules to promote a green shift. The relationship among investment, trade, and the environment, to a very large extent, depends on the formulation of domestic policy, but it also requires good quality international guidance and regulations. Strong domestic policies and international rules can complement each other. As China engages in the global governance process and participates actively in developing international environmental rules, it should always keep in mind that it is still a developing economy that must actively safeguard the interests of its own economic development and environment. How to balance the interests between the two will be a major challenge. Despite China's status as a major developing power, there are still considerable development hurdles at home, the solutions for which are not always understood abroad. This is a real challenge that requires China to act consistently at home and abroad when it comes to environmental governance. This is why China must take more initiative in participating in international rule-making processes on investment, trade, and environment. It must ensure its space next to the developing world while preserving its interests and relations among more advanced trading partners.

Recommendation: China should use FDI to help promote its green transformation and sustainable development by ensuring a more balanced sectoral and regional distribution of FDI, with environmental concerns dealt with in a consistent manner.

See Chapter 6 for more discussion about this recommendation.

2 The environmental impact of Foreign Direct Investment (FDI)

Attracting foreign capital has become an important way for China to participate in economic globalization. As one of the key sources of funding fixed assets in China, FDI promotes—in varying degrees—economic development; the expansion of employment opportunities; the improvement of employment quality; and the increase of government revenues. At the same time, foreign enterprises also enjoy the benefits of China's rapid development. According to the survey report published by the US-China Business Council in 2011, nearly 90% of American companies say that their business performance in China meets or exceeds global levels[①].

But FDI can also be considered a "double-edged sword" for host countries like China. The large-scale influx of FDI into sectors such as manufacturing, natural resources, and infrastructure construction, will heighten environmental pressures on the country. The major objectives of this chapter are:

(1) To review the sustainability of China's policies for attracting foreign investment during the three decades of reform;

(2) To analyze ways to guide foreign investment flows so that they positively and truly promote a green shift; and

(3) To study the enhancement of the halo effect and the spillover effect of foreign investment, in an effort to build the capacity of Chinese enterprises in terms of environmental management and environmentally friendly technology, and help China improve the market system in support of sustainable development.

2.1 Definition of FDI and its current status in China

FDI, according to the definition in China's National Yearbook, refers to investment by foreign enterprises and economic organizations or individuals (including overseas Chinese residents of Hong Kong, Macao, and Taiwan, and Chinese enterprises registered overseas) to open solely foreign-funded enterprises; run Chinese-foreign equity joint ventures; participate in cooperative joint ventures or co-develop resources with any enterprises or economic organizations within the territory of China in the form of spot exchange, real object, or technology (including re-investment of income from foreign investment); as well as the actions of any enterprise borrowing funds from overseas within the total amount of project investment approved by relevant government authorities.[②] Currently, foreign investment in

① Europe China Economic&Trade Review，Jan. 2011: www.europe1china.com

② Source: *China's National Yearbook 2009*, National Statistical Bureau

China has the following prominent characteristics:

(1) FDI in China comes from diverse sources. More than 170 countries and regions invest in China. According to the actual accumulated investment numbers (see Figure 1), half of the FDI is from Hong Kong, Macao and Taiwan, a quarter is from Europe, the US and Japan, about one-tenth is from Southeast Asian countries, and the rest is from tax havens. The actual investment from Hong Kong, Macao, and Taiwan has reached USD 74.8 billion, which represents 70.77% of the total foreign investment in China. In 2010, 1,688 enterprises (an increase of 6.97% over 2009) from 27 EU countries established their operations in China with an actual investment of USD 6.6 billion (an increase of 10.71% over 2009). Also in 2010, 1,576 US enterprises (a modest decrease of 0.76% compared to 2009) established their operations in China with an actual investment of USD 4.1 billion (an increase of 13.31% over 2009).

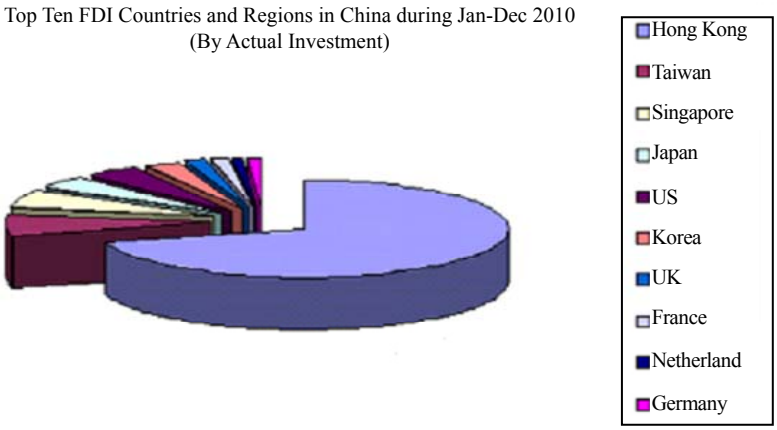


Figure 1 Top Ten Countries and regions Sources of FDI in China, January to December, 2010

Source: MOFCOM.

The proportion of FDI in the manufacturing sector when measured against total FDI in China has shown a downward trend since 2005, while the proportion of FDI in the service sector has been increasing. FDI in the two sectors was roughly equal in China in 2010 (see Figure 2).

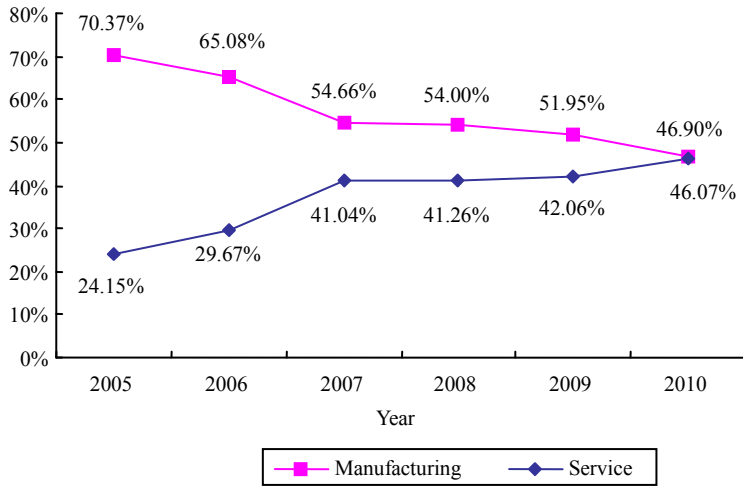


Figure 2 Proportion of FDI in the Manufacturing and Service Sectors in China, 2005–2010

Source: China's National Yearbook, National Statistical Bureau, statistics from MOFCOM.

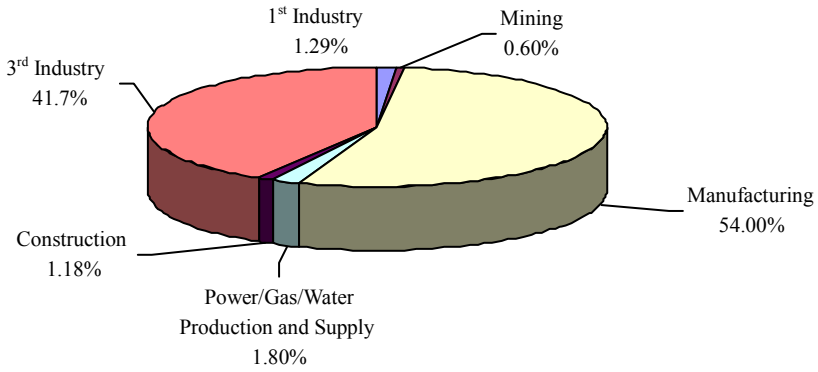


Figure 3 FDI by Sector, 2008

Source: China's National Yearbook 2009, National Statistical Bureau.

(2) FDI in China is diversified in method of investment. The proportion of joint-ventures is 40%; the proportion of wholly-owned foreign enterprises is 40%. Sino-foreign cooperative enterprises represent 17% of FDI and the rest is composed of cooperative developments, shareholding arrangements, etc.

(3) The geographical distribution of FDI in China is very unbalanced. FDI scale and benefits in the eastern costal area are much larger than those in other areas in China. The

investment environment in the eastern coastal area—Bohai Economic Rim (including Shandong Peninsula, Liaodong Peninsula, Tianjin, and Beijing) centered around the Jingjintang Region; the Yangtze River Delta (including Zhejiang, Shanghai, Jiansu, etc.) centered around Shanghai; and the Pearl River Delta (including Guangdong) centered by Guangzhou—is comparatively sound due to policies of reform. These areas have attracted more than 80% of FDI in China. FDI is gradually moving into middle and western areas with an improving investment environment and market-driven forces attracting FDI to the areas.

2.2 Social and Environmental Impacts of China's FDI

Depending on the period, China's FDI acceptance policies, and the nature of foreign investment, the growth of FDI in the country can be divided into four stages:

(1) Initial stage (1979–1985)

1) Development features

① The Law of the People's Republic of China on Chinese-Foreign Equity Joint Ventures marks the legalization of foreign investment;

② Foreign investments in China are mainly exploratory;

③ Investment is mainly concentrated on four special economic zones (Shenzhen, Zhuhai, Shantou, and Xiamen), and national foreign investment has not yet expanded broadly.

2) Environmental impacts

Foreign investment in China had not expanded into full swing. Total investment was on a small scale, thus the impacts on the environment were limited.

(2) Rapid development stage (1986–1995)

Development features

① Accelerated the legislative work related to foreign investment, and improved the climate for foreign investment;

② Under the multiple super-national treatment stimulation, foreign investment grew rapidly.

2) Environmental impacts

Guided by a series of preferential policies, such as "market for technology," a large number of foreign investments entered manufacturing, chemical, and other pollution-intensive industries. Because the investment structure presented no limits and foreign investment continued to increase, it led to large transfers of pollution-intensive industries to China, with varying degrees of impact on the environment.

(3) Adjustment and improvement stage (1996—2005)

1) Development features

① Guiding policies on foreign investment emerged: *Interim Provisions on Guiding Foreign Investment Direction;* the twice amended *Catalogue for the Guidance of Foreign Investment Industries;* and the amended *Catalogue of Priority Industries for Foreign Investment in the Central-Western Region;*

② The average scale of foreign investment continued to expand;

③ The industrial structure of foreign investment was further adjusted with foreign investment in high-tech, infrastructure, and other sectors increasing substantially.

2) Environmental impacts

The environmental impacts of foreign investment attracted more and more attention, and some large multinational corporations began to pay attention to internal environmental management, but the demonstration effect to domestic enterprises was limited. Due to the continuous expansion of foreign investment, the effects were still primarily negative.

(4) Sustainable, coordinated, and stable development stage (2006–present)

1) Development features

① In 2007 the *"Enterprise Income Tax Law of the People's Republic of China"* was formally enacted, merging the two income tax regimes for domestic and foreign enterprise, thereby leveling the playing field for foreign investors;

② There is stronger policy guidance regarding what industries and regions will be promoted for more foreign investment;

③ There are initiatives to promote various forms of domestic and foreign technical cooperation and joint innovation;

④ There is improvement in foreign investment projects vis-à-vis energy and water consumption; occupation of land; and other access standards, demonstrating an evolving focus on the sustainability of foreign investment.

2) Environmental impacts

With sustainability becoming a mainstream focus of development, and with China's strict restrictions on the entry of low-level, high-consumption, and pollution-intensive foreign investment projects, the environmental impacts of foreign investment are gradually demonstrating a positive side [①].

① ZHOU Guomei, LI Xia, et al. Topic Report 2 of this Task Force.

2.3 International comparisons

2.3.1 FDI in Brazil, India, China, and the United States

Brazil's welcoming of FDI occurred several decades before China's, and therefore Brazil faced sustainable development challenges much earlier. Under the guidance of the government, the structural transformation of FDI in Brazil is basically complete. FDI in Brazil is mainly concentrated in low-polluting industries such as service, energy, communication, finance, and transportation.

Recommendation:Ensure, as a matter of principle and legal framework, that FDI into China and China's ODI should be held to a high standard on corporate social responsibility.

See Section 6 for more discussion about this recommendation.

India's national conditions are similar to those of China, and its national development strategy is also very much like China's. However, compared with India, China features greater government intervention in the economy, therefore, the Chinese government has an advantage over India's in terms of creating the conditions to attract foreign investment in the manufacturing sector. Meanwhile, the service industry, which is also labor-intensive, sees strong growth in India. The different policy orientations of these three developing countries have led to different distributions of FDI throughout their respective economies, and different degrees of environmental impact.

By comparison, the investment policies of the United States place more emphasis on establishing a long-term stable investment environment. The government aims to provide foreign investors with a fair, transparent, and liberal investment environment and excellent infrastructure, featuring a limited and predictable policy system and efficient and high-quality government services. Investors must observe various legal provisions in the United States, including its environmental standards and environment-related legal provisions. The high degree of market orientation also forces enterprises to attach importance to the sustainability of investment; otherwise they will be eliminated by the market. In contrast, China's investment-attracting policies are mainly aimed at gaining significant short-term benefits against the backdrop of local governments' blind pursuit of GDP. Some of the policies were even launched at the cost of national assets and environmental destruction. The relative disconnect between investment laws and the environment, lack of relevant and up-to-date project management expertise, and weak regulation over foreign-funded enterprises are important causes of unreasonable FDI structure and serious environmental destruction in China.

2.4 Opportunities and challenges facing foreign investment

Since the outbreak of the financial crisis, China has succeeded in maintaining a stable investment climate, providing a relatively safe harbor for FDI. As the government encourages further FDI, specifically towards the central and western regions of China, it can use environmentally-based incentives to better distribute these new investments. This approach can help China address its continuous need for new FDI, related technologies, and ecologically sound initiatives.

While China remains a most attractive host country destination for FDI, foreign investment is also increasingly confronted with a series of new and changing concerns. The various challenges faced by the Chinese economy are compounded by external environmental and economic changing conditions. Operating costs in China are rising. With industrial structural adjustment in China, the international competition for FDI will be further intensified. With the further improvements and the maturing of China's market mechanisms, various "super-national treatments" that foreign-funded enterprises currently enjoy will end (some have already ended), thereby placing higher demands on foreign-funded enterprises.

Case Study: Royal Dutch Shell
Shell's sustainable development report is an important channel for its active disclosure of environmental information. Compared with the environmental information disclosed by Shell China, the reports of Shell's American and Dutch subsidiaries, though imperfect, cover a wider range of issues, and provide much more in-depth information, including Shell's efforts in air and water preservation and energy utility; the environmental impact of Shell's operation; safe production, etc. The reports also articulate the company's social responsibility initiatives. The contents of the Shell China report, on the other hand, are simpler, without global considerations or descriptions of technological innovation and applications from the perspective of global energy use. As specific data are not required by China—the host country in this case—the Shell China report lacks detailed information in terms of environmental performance and therefore, on a comparative basis, its environmental performance measures are superficial.

2.5 Conclusion

Since China started to accept FDI three decades ago, the flow of foreign capital, all-in-all, has had positive and negative impacts on China's environment and development. It

is hard to say on balance whether the net contribution of FDI is positive in relation to the environment. In any case, rapidly absorbing large amounts of new investment in pollution intensive industries has made China the "world's factory" confronting it with very serious environmental challenges. As China has become an important destination for transnational corporations, it has been increasingly exposed to some of their new thinking, raising awareness about the importance of environmental protection; stimulating concern among the public; and introducing corporate social/environmental responsibility policies into the investment deployment process.

The uneven distribution of foreign investment in industries and regions has increased the difficulty in regulating pollution. The environmental advantage of foreign investment in sensitive industries is weakened. Take the chemical industry, for example. In the last five years, the pollution associated with investment from FDI in this sector has been increasing, and the continuous increase of foreign investment in the chemical industry, to some extent, does not meet China's environment and development policy orientation of "energy conservation, emissions reduction, and green development."①

Foreign investment will continue to be an important driving force in the Chinese economy, but we should not blindly overestimate the influence of foreign investment on Chinese enterprises. In fact, FDI cannot truly foster domestic enterprises, and the re-invigoration of national industries in China must rely on longer-term, domestic efforts. Foreign investment should provide important support for preventing the constant inflow of old, inefficient technology while optimizing the economic growth structure. Voluntary environmental measures, as a new approach to environmental management, are still in their very early days in China. Foreign investment's "spillover effect" can be used to effectively promote the development and progress of voluntary environmental measures in China.

3 Environmental and social impacts of Chinese ODI on host countries

With the rapid growth of China's outward direct investment (ODI), the country's enterprises have become more visible on the world stage, but so have their considerable environmental and social impacts on host countries. With the increased awareness of environmental protection in host countries, governance of natural resources, and increased attention to corporate social responsibility by the international community, China's ODI needs to concern itself with environmental issues and the potential social benefits to host

① ZHOU Guomei, LI Xia, et al. Topic Report 2 of this Task Force

countries.

This chapter analyzes and discusses how to treat China's image, including perceptions of its ODI by media and other parties; whether Chinese overseas enterprises only comply with lower environmental standards in host countries; whether a large number of medium-sized and small Chinese overseas enterprises pollute the local environment of the host countries; and how well Chinese overseas enterprises have performed vis-à-vis minimum wage standards, medical care, welfare measures, and local employment.

3.1 The current state of China's ODI and future trends

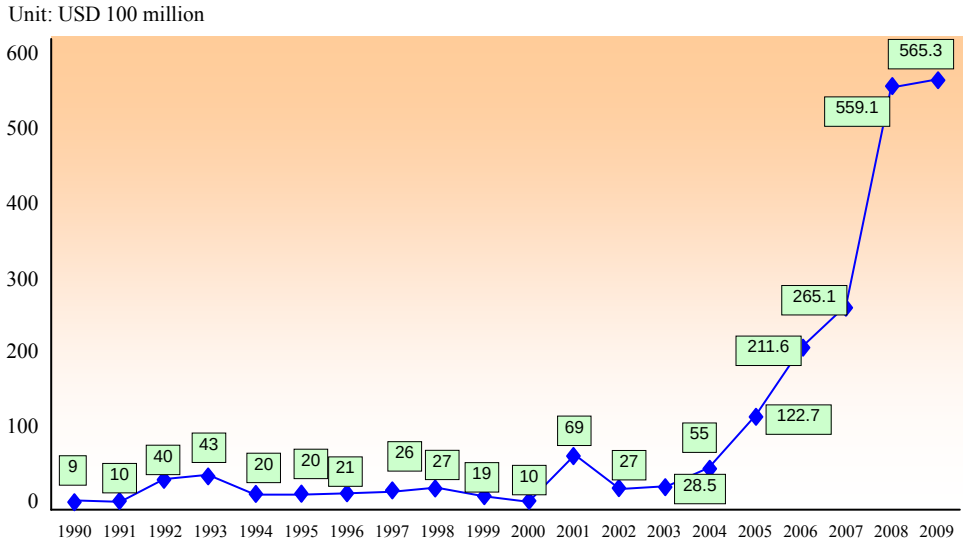
3.1.1 Current state of China's ODI

With a diverse and growing economy, the volume of China's ODI has been increasing rapidly since the 1990s. The "going global" strategy of 2002 has been a major driving force for the increase in ODI.

China's volume of ODI increased from USD 33 to 230 billion during 2003–2009, approximately a seven-fold increase. By the end of 2009, 12,000 domestic Chinese investors had created 13,000 directly-invested enterprises in 177 countries around the world, totaling USD 245.75 billion in investments. These were broken down into USD 76.92 billion in equity investment (31.3% of the total), USD 81.62 billion in reinvested earnings (33.2% of the total), and USD 87.21 billion in other types of investment (35.5% of the total). The total assets of Chinese enterprises operating overseas exceeded USD 1 trillion by the end of 2009 (see Figure 4).

Recommendation: China should focus its ODI not only to play a significant role in meeting China's "12th Five-Year Plan" targets, but also to promote host country green development and transformation, in line with objectives defined by the host nations, the Millennium Development Goals, and other relevant international sustainable development objectives. China should articulate and expand its policy guidance for enterprises that are "Going Global," so that its ODI is consistent with China's green development vision.

See Section 6 for more discussion about this recommendation.



Note: Figures of China's ODI from 1990 to 2001 are from UNCTAD's World Investment Report; figures from 2002 to 2009 are from MOFCOM.

Figure 4 Rapid Growth of China's ODI

Source: UNCTAD and MOFCOM.

Despite the recent rapid growth of China's ODI and the fact that it ranked fifth in the world (first among developing countries) in 2009, the flow and volume of ODI of China respectively accounted for merely 5.1% and 1.3%[①] of the 2009 world's total.

3.1.2 China's ODI structure

Contrary to many assumptions about China's ODI being concentrated on energy and mining, the sectoral distribution of China's ODI is actually reasonably balanced (Figure 5). Leasing and commercial services, and the finance sector each represent a higher percentage of Chinese ODI than mining, which accounts for a mere 16.5%. The manufacturing sector ranks even lower at 5.5%. This is in clear contrast with the characteristics of China's domestic economic structure.

① UNCTAD World Investment Report 2010.

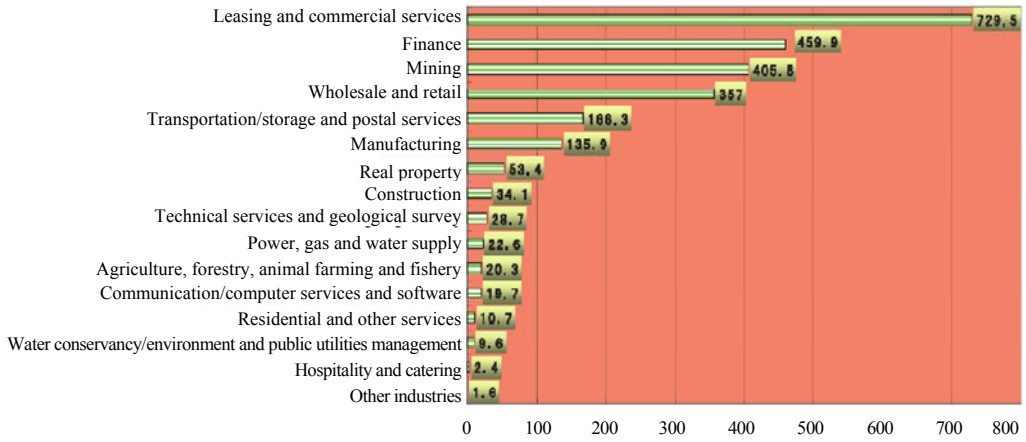


Figure 5 Industrial Distribution of ODI Volume of China by the end of 2009

Source: 2009 Statistical Bulletin of China's Outward Foreign Direct Investment, MOFCOM

Heavily concentrated in Asia, followed by Latin America and Africa, the geographic distribution of Chinese ODI is highly uneven. By the end of 2009, the investment volume in Asia registered at USD 185.5 billion, accounting for 75.5% of the total volume and mainly concentrated in Hong Kong, Macao, Japan, South Korea, and Southeast Asian countries; the investment volume in Latin America was USD 30.6 billion, accounting for 12.5% of the total and mainly concentrated in the British Virgin Islands, the Cayman Islands, Brazil, and Peru; the investment volume in Africa was USD 9.33 billion, accounting for 3.8% of the total and mainly concentrated in South Africa, Nigeria, and Zambia (see Figure 6).

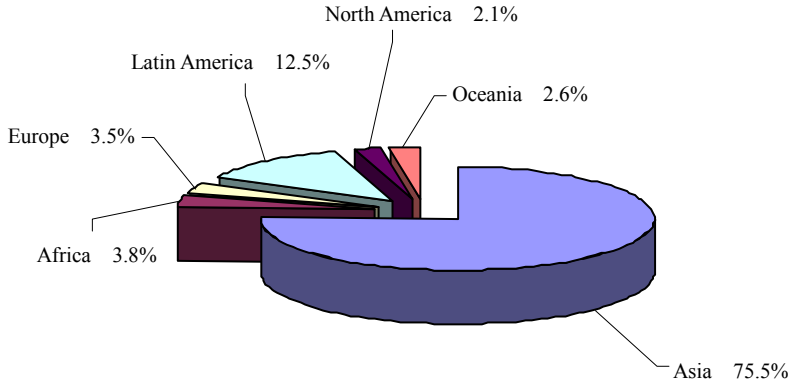


Figure 6 Regional Distribution of China's ODI

Source: 2009 Statistical Bulletin of China's Outward Foreign Direct Investment, MOFCOM.

From an ownership perspective, state-owned enterprises (SOEs) account for the largest proportion at 69.2% of China's total ODI, followed by limited liability companies and shareholding limited companies, accounting for 22.0% and 5.5% respectively; while privately-owned enterprises account for a mere 1.0% (see Figure 7).

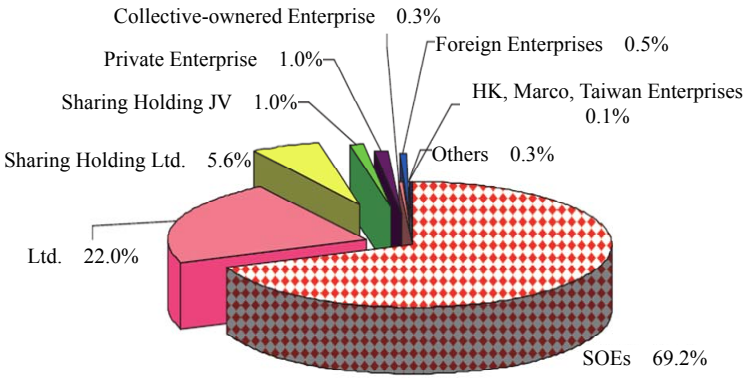


Figure 7 Non-financial Volume of China's ODI at the end of 2009, by Registration Type of Domestic Investors

Source: 2009 Statistical Bulletin of China's Outward Foreign Direct Investment, MOFCOM

3.1.3 Future trends in Chinese ODI

China's ODI is gradually becoming more diversified as the number of technology-intensive projects continues to increase. China's ODI facilitates the export of merchandise related to its domestic production, while trade related to ODI plays a significant role in the growth of foreign trade. According to a UN survey in 2010, China ranks second in the world in global investment potential (UNCTAD, 2010a).[①] China's confidence in ODI was not dampened by the global economic crisis. In 2009, its non-financial ODI reached USD 43.3 billion with significant annual growth. The Ministry of Commerce predicts that China's ODI for 2010 will have totaled USD 60 billion. Most of the ODI flows to Asia, Latin America, and Africa and is focused on design and manufacturing, sales, and the retail and trade sectors. Mining and resource-related sectors are becoming the new focus of investment by Chinese enterprises.

As growth in ODI increases, so too do complaints of environmental and social impacts.

① Yin-Wong Cheung, XingWang Qian, Shu Yu, China's Outward Direct Investment in Africa

3.2 Social and environmental impacts of China's ODI

3.2.1 Social impacts and challenges of China's ODI

China's ODI has created a large number of job opportunities for host countries, but there is still room for improvement in the employment structure it provides. In Cambodia and Vietnam, investment by Chinese investors in manufacturing is concentrated on labor-intensive manufacturing. In Cambodia, the 27 Chinese manufacturers surveyed have a total of 26,439 employees, 98% of whom are Cambodian. In Vietnam, the 33 Chinese enterprises surveyed have provided a total of 10,020 jobs, 95% of which are held by Vietnamese[①]. The labor structure within an enterprise may vary according to the level of technical intensity. In Cambodia, local employees account for less than 30% of the intermediate and senior positions as most of the senior executives are Chinese. This situation can be attributed to Chinese investors' belief that local candidates are lacking in skills and experience. Therefore, the clothing industry and Asian enterprises have come to a consensus that Chinese nationals should constitute a large proportion of supervisors. However, communication difficulties and cultural differences between these Chinese nationals and local Cambodian workers sometimes lead to labor unrest and strikes, and Chinese supervisors cannot easily solve these problems. The case in Vietnam is the opposite, as 63% of supervisory positions are held by Vietnamese. The major difference between Chinese enterprises operating in Cambodia and Vietnam is the gap of education level between these two countries. In Vietnam, Chinese enterprises would rather employ Vietnamese than expensive overseas Chinese as executives as it costs less for to train their Vietnamese employees for these executive positions.

Governments of many countries require Chinese enterprises to provide a certain proportion of employment opportunities for local workers. For example, the host country of the national stadium project in Costa Rica demanded that the project be completed within one year and that no Chinese workers should be involved. (In the end, only Chinese workers were employed and the stadium was finished in two years).[②]

The cultural challenges faced by Chinese enterprises pose a major barrier to their development. Chinese enterprises investing overseas are faced with an unknown environment featuring totally different commercial practices, not to mention management,

① EU-China Civil Society Forum, *The Impact of Chinese Outward Investment,* Published on 2 March, 2011, Viewed on 13 Oct., 2011： http://www.eu-china.net/.../11-03-02_Impact%20of%20chinese%20outward%20investment.pdf.
② Older Entry, *Costa Rica Insight,* viewed on 13 Oct., 2011, http:// costaricainsights.wordpress.com/page/2/.

financial, and cultural rules that differ from those on China's mainland in green field investment as well as mergers and acquisitions (M&A). For example, studies of M&A of Chinese enterprises in Germany show that the most important factors in managing overseas acquisitions are staff integration and narrowing the cultural gap between Chinese investors and the corporate protocols in Germany①.

In Zambia, many of the local complaints from community and labor representatives centered around misunderstandings and social clashes occurring between Chinese and local people due to a lack of dialogue and cultural exchange. These seemingly superficial crises often led to deep resentment, xenophobia and hysterical media accounts that were based it would appear on misperception and a lack of communication. In order to improve the performance of an acquisition, Chinese enterprises must make a special effort to better integrate with their host community in order to prevent and resolve cultural differences; and create links with the local society, its stakeholders, its government and NGO representatives, as well as the environment, labor, and regulatory officials of host countries.

The performance of ODI may vary greatly depending on circumstances, and even well-planned direct investment projects may be confronted with unexpected difficulties due to differences in culture and management practices. For example, TCL found itself in a very difficult situation after its acquisition of Alcatel in France due to difficulties in managing local staff; Shougang Group was challenged by strikes and conflicts between investors and labor in South America; Shanghai Automobile Industrial Corporation (SAIC) also had similar experiences after its acquisition of Ssangyong Automobile in South Korea in 2004 and failed in its negotiation with the labor union on wages.

Likewise, during the TF field trip to Indonesia, the team visited the Pertamina-Petrochina joint oil desulfurization unit in Bojonegoro, East Java. While the company had serious accidents in the past, management was proud to show that it had reduced its accident rate to zero since the arrival of the Chinese partner. Nevertheless, they had suffered a lot of complaints from the field as Chinese drilling rig equipment had no safety notices in either English or Bahasa Indonesia (Indonesia's official language). A small detail considering the size of the investment, but it led to false allegations that the equipment was not safe and performed below par. The local media amplified these issues creating the false image that Chinese drilling rigs were of low quality and PetroChina's drilling teams were not concerned with worker safety.

China's ODI enterprises suffer from a lack of expertise, experience and

① Kay, Li Kuen Andrew, *International Exhibition Organizers in China and Their Performance*, The Hong Kong Polytechnic University, Published in June 2007, http://www.cpexhibition.com/introd/Kay%20DBA.pdf.

preparation. Poor confidence and inadequate experience in cross-border investment in a strictly regulated environment with complicated market administration have proven the lack of necessary expertise of Chinese enterprises. Examples include the joint-venture of SAIC and Ssangyong Automobile in South Korea and the recycled steel plate project operated by Baosteel in Brazil. However, although increasing globalization has exposed the limited expertise of Chinese enterprises in large-scale Western-style acquisitions, many destinations of Chinese ODI—especially Africa and Asia—still feature weak organizational structures, flawed intellectual property rights protection, government intervention, and different corporate management systems. Western multinationals are comfortable operating in stable markets with transparent regulations, while their Chinese counterparts are better equipped to operate in more complicated and unclear regulatory frameworks. This could be considered one of the unique advantage's that have helped China develop innovative and country specific relationships with African countries. Its business expansion in that continent has become a strong example of its "going global" strategy.

China is still suffering from the negative effects of its ambiguous definition of property rights, a lack of a clearly defined regulatory mechanism for the private sector, flawed corporate governance, and inadequate experience in international business. Private enterprises in China are relatively weak in seizing ODI opportunities. Their senior management need to be trained to enhance corporate governance in line with international practices. In countries with mature institutional systems, the costs of contracts and other legal supports are relatively low, making them effective in building relationships, yet Chinese enterprises need more time to be adopting them.

Their global presence will inspire changes in Chinese enterprises, especially those who have entered developed countries and compete in high-end product markets. How should Chinese enterprises establish their own identity on a global scale, designing suitable business models adapted to the realities of different countries while enhancing corporate governance both at home and abroad? How should Chinese enterprises improve the quality of their products and services as well as corporate governance while competing for market share and developing an institutional system in China? What modern governance system is suitable for the trajectory of development in China? These questions will exert profound influence on the development of Chinese enterprises for the foreseeable future.

3.2.2 Environmental impacts and major challenges of China's ODI

3.2.2.1 Environmental impact on forest and biodiversity

Research into the environmental impacts of China's ODI considers the exploitation of

natural resources and the degradation of biodiversity. For example, China's investments in Southeast Asia and Africa are concentrated in environmentally sensitive sectors (e.g., petroleum and gas extraction, mining, hydropower, and forestry) and infrastructure projects (e.g., highways, railways, electric-power and transmission lines). The Kunming-Bangkok Highway, an important corridor for trade and investment and a facilitator of interaction between China and Southeast Asian countries, is significant for economic prosperity and development. However, environmentalists believe the highway has damaged local biodiversity. A Chinese enterprise built a rubber plantation in the "Golden Triangle," to help Burma and Laos replace the cultivation of cash crops and illegal logging in an opium-based economy, as the governments try to eradicate drug abuse and poverty. However, similar allegations of local biodiversity damage have also been leveled against the Chinese. There is clearly a need to study how to better assess those projects.

China is the second largest importer of wood products in the world. Chinese logging companies have expanded around Southeast Asia, West Africa, and in the Amazon region. Approximately one third of such imports is intended for processing and re-export to G8 countries. Exports from Africa to China have been rising quickly, and it is estimated that 70% of these exports are from Gabon and Equatorial Guinea. Russia has also become an increasingly important source of timber to China. Illegal logging and certification are of great concern to the international community[①].

During the TF visit to the East Kalimantan region of Indonesia, the team assessed the impacts of China's growing trade in coal and palm oil; China is Indonesia's second buyer of palm oil. Increasing demand for the oil, coal and the lucrative nature of the international market, combined with weak public governance at the domestic level promote illegal logging, deforestation, and the rapid conversion of forest land into coal mining and palm oil plantations in Indonesia. This type of coal and palm-oil operation has caused massive ecological damage and adverse social-economic impacts to the region and to local communities. Yet, China is more interested in importing the raw natural resources for domestic processing, while leaving the responsibility of the upstream impacts of this business, such as illegal logging and degraded forests, entirely in the hands of the host country.

3.2.2.2 Challenges in environmental standards compliance

A pre-project evaluation of environmental impact; the implementation of environmental measures during a project; and environmental assessment after completion are required for

① Prof. Sun Siheng, State Forestry Administration, A Guide on Sustainable Management and Utilization of Oversea Forest by Chinese Enterprises, Published on 8 September, 2010.

all projects funded or financed by the China Export-Import Bank[①]. China's environmental standards are compared with those of the host country, and the higher standards are adopted.

Research conducted by the CCICED team in Zambia found that the energy consumption of copper production per Mt in Luanshaya Copper Mines—in which China Nonferrous Metal Mining (Group) Co. is investing—is 186 Mtce with the application of the most advanced technology and equipment from Australia. At the same time, the energy consumption of copper production per Mtce is 260 Mt of standard coal equivalent at China-Yunnan Copper Co., Ltd. and Jiangxi Copper Co., Ltd. This case shows that environmental standards adopted by the enterprise in Africa appear superior to the standards applied in China.

Many well-known Chinese enterprises, managing environmental concerns, have taken the initiative to adopt ISO14000 environmental standards and the ISO26000 guiding principles of social responsibility. However, problems in compliance with environmental standards may exist with some medium-sized and smaller enterprises (SMEs) due to their limited environmental awareness, economic strength or other reasons. While some developing countries in Asia, Africa, and Latin America are developing stronger environmental awareness, with environmental standards that are increasingly aligned with the international mainstream, the environmental behavior of Chinese SMEs still often lags behind such mainstream levels. Whether the companies are large, medium, or small-sized, they are representing Chinese interests and respect for the environment should be part of their way of doing business. This should be the case regardless of whether or not the Chinese government provides foreign aid, capacity development, or other assistance to the developing host country.

3.3 Related roles played by major stakeholders in reducing the social and environmental impacts of ODI

3.3.1 China's ODI enterprises

When it comes to the adoption of modern social and environmental approaches to their ODI activities, Chinese enterprises still appear to be 15–20 years behind their western counterparts. This is perhaps due to the more active role of influential NGOs in the west. At present, Chinese some enterprises are making a considerable effort to invest in

① China Intelligent Online, *China Environmental Protection Industry Overview,* Published on 2008, Viewed on 13 Oct., 2011, http://www.slideshare.net/chinaintel/china-environmental-protection-industry-report-2008

environmental enhancement and projects to advance social well-being, yet there is a major gap in capacity and roles between state-owned and private enterprises. Generally speaking, the social and environmental performance of large state-owned enterprises is somewhat better. Considering that over 70% of Chinese ODI comes from large state-owned enterprises and only 1% from medium- and small-sized enterprises, it is easy to conclude that the overall environmental and social impact of Chinese ODI is largely in the hands of the government.

In recent years, China has actively promoted policies that stress the adoption of social and environmental commitments by FDI and ODI enterprises. For example, in 2007, China's import and export bank (EXIMBANK) promulgated the "Guiding opinions on the environment and social evaluations of EXIMBANK loan projects." That same year, the China Banking Regulatory Commission printed and distributed "Opinions on consolidating the corporate social responsibilities of the banking industry and financial institutions," requiring that large-scale banks abide by the 10 basic principles of CSR advanced by the UN Global Compact. The Commission also asked these banks to prepare CSR reports to articulate their activities. In 2007, the Ministry of Environmental Protection, together with the People's Bank of China and the China Banking Regulatory Commission issued documents that established China's Green Credit Policy. The International Finance Corporation (IFC) Performance Standards and the Equator Principles were identified as international guidance documents that Chinese banks can refer to in their implementation of the Green Credit Policy.

In addition，in order to encourage the enterprises to engage in CSR activities, in December 2007, the state-owned Assets Supervision and Administration Commission of the State Council distributed the "Guiding opinions on the exercising of corporate social responsibilities by state-owned enterprises," and proposed that as Chinese enterprises "go global," they should help host countries modernize and implement their environmental regulations. The international trend towards more environmental considerations in international agreements is quite clear and China should be fully engaged in contributing to its development.

3.3.2 Central and local governments of host countries: sharing responsibility for regulation and enforcement

Chinese enterprises generally abide by the laws and regulations of the host countries in which they invest, hence it is the central and local governments of the host countries that should play the major role in regulation. A Canadian governmental official, while analyzing

the positive and negative impacts of China's investment in the mining sector of Canada, said that China-based overseas investors are beginning to learn to abide by local laws and regulations with no apparent difference from other industrialized countries[①]. In the bidding efforts for investment in Rio Tinto in February 2009, the president of Chinalco endorsed the sustainable development pledge of Rio Tinto[②]. In Indonesia, the local Regent of Bojonegoro, East Java, told the TF team visiting PetroChina's oil exploration operations that they were taking voluntary actions in relocating schools and communities as well as financing mobile libraries for the local populations (together with EXXON-Mobil) in order to spare them from the pollution and dangers of living in close proximity to oil desulfurization plants and crude oil production wells. These actions were very much appreciated and widely recognized by the local communities.

On the other hand, there are reports of Chinese enterprises, especially small private enterprises, turning a blind eye to environmental requirements or bribing local officials. An increasing number of NGOs and civil society organizations criticize Chinese enterprises for failing to comply with local laws and regulations. The solution requires, in part, the application of a transparent and accountable system to the public in the host country and improvement in the administrative capacity of host governments to enforce their laws and regulations.

3.3.3 Central and local governments of China: sharing responsibility for the environment

As China positions itself to become a major global player, central and local governments are beginning to require Chinese enterprises to improve their environmental performance and enhance their social contribution in an effort to safeguard China's image and promote sustainable global investment and business. Progress in policy-making, legislation, and standardization in China is an important driving force for Chinese enterprises to meet environmental and social goals. In particular, the Chinese government requires enterprises to conduct clean production auditing on a regular basis, which effectively improves their environmental performance. And Chinese enterprises, state-owned and private, are actively engaged in improving their governance and ameliorating their environmental and social impacts at the urging of government. A positive example is that

① Prof. Sun Siheng, State Forestry Administration, *A Guide on Sustainable Management and Utilization of Oversea Forest by Chinese Enterprises*, Published on 8 September, 2010.

② UNCTAD, *World Investment Report 2009*, Published in 2009, United Nation Publication, ISBN 978-92-1-112775-1, http://www.unctad.org/en/docs/wir2009_en.pdf.

China's Forestry Administration issued A Guide on Sustainable Overseas Forests Management and Utilization by Chinese Enterprises to provide guidance on investment and operations of China's ODI in host countries in consideration of sustainable development, environmental protection, and CSR.

3.3.4 Non-governmental organizations

Non-governmental organizations may monitor ODI and ensure that these investments will not exert negative impact on local environment and society. Of all Chinese ODI activities, two major areas are of particular concern: natural resources, such as coal, wood, petroleum, natural gas, etc.; and construction projects, such as building highways, hydro-dams, water supply reservoirs, electric-power and distribution systems, public housing, etc. Both types of investment have important social and environmental impacts. Therefore, enterprises must exert the utmost diligence in avoiding such impacts, compensate for any damage by restoring and rehabilitating damaged sites, and offer additional compensatory facilities such as new schools and hospitals that can somewhat mitigate impacts. These proactive steps in a "going global" project are likely to be acknowledged by the beneficiaries of such investments and lead to a more positive perception of China by the residents of the host country. Local stakeholder organizations and international NGOs may play a role monitoring such actions and controlling malevolent or corrupt and defamatory media campaigns against Chinese interests.

3.3.5 Media

The strong and committed environmental governance efforts of some Chinese enterprises involved in ODI projects have produced quite visible positive results as Chinese enterprises assume greater CSR initiatives. For example, the China International Marine Containers (Group) Ltd. has adopted the UN Global Compact Environment Statement; China National Petroleum, Sinopec, and CNOOC have adopted a series of rigorous environmental protection standards; and the Industrial Bank of China has become the first Chinese bank to adopt the Equator Principles. Yet international media tend to focus mostly on criticizing the environmental performance of China's outward investments, which raises suspicions about the country's strategy of "going global." Furthermore, there is little coverage about Chinese ODI in the Chinese media, and even less coverage about the environmental and social impacts of such investments. An improved Chinese media focus on the efforts made by Chinese enterprises to minimize their negative environmental impacts will help create a more accurate image of Chinese ODI and help reduce the negative

perceptions transmitted by the international media.

3.4 Examples of the positive contributions of Chinese ODI

3.4.1 China's ODI in the natural resource sector

The investment by Chinese state-owned enterprises in the natural resource mining and petroleum sectors of some South American countries has had significant impacts on local societies, economies, and their environment. At first, those impacts tended to be negative, but as the firms adjusted their CSR strategies and policies, positive impacts began to gradually manifest themselves. Andes Petroleum Ecuador Ltd., a joint venture of CNPC and SINOPEC, for instance, is a symbol of China's cooperation with the central government of Ecuador. The company plays an active role in the alleviation of tensions between the local government and its residents. Shougang Hierro Peru S.A.A. has also reversed its early negative impact on the social development of the Peruvian community where it operates by deciding to adopt a proactive approach to addressing local social issues it used to ignore.① In Indonesia, on the other hand, the TF team witnessed considerable environmental degradation related to surface coal mining activities in East Kalimantan intended to supply Chinese trade. Over 24% of imported coal in China in 2009 was from Indonesia, and Kalimantan accounts for a majority of coal production in Indonesia. In 2005, East Kalimantan's share was 51.7% and South Kalimantan was 41.2%. Significant production increases in recent years have occurred to supply the export market at more than 75% of national coal production. Most of that goes to China, which is blamed for the resulting environment damage to Indonesia.

3.4.2 China's ODI in the new energy sector

China's ODI enjoys great opportunity in the new energy sector. In Africa and developing countries elsewhere, Chinese low-carbon technologies and products are particularly competitive with advantages ranging from low costs, limited infrastructure requirements, low emissions, and high economic returns. Compared with advanced technologies and products in western countries, Chinese companies are better equipped to facilitate green development and the required economic shift in developing countries. Installing a Chinese low-carbon solar water heater is one-third the cost of installing an average water heater. Likewise the extensive palm oil plantations being stimulated by

① Julie Jiang & Jonathan Sinton, *Oversea Investments by Chinese Oil Company,* International Energy Agency, Published in February, 2011, http://www.iea.org

China's appetite for vegetable oils could also provide a unique resource for renewable energy through biodiesel applications. The TF team visited a small, privately-owned Chinese steam boiler and electric turbine producer on the outskirts of Jakarta (ZUG POWER GROUP, PT. ZUG Industry Indonesia). The firm was anxious to receive some form of incentive to produce small off-grid power plants that would use their equipment and supply renewable energy to isolated communities. The new energy resource sector will become an increasingly important target for Chinese ODI.

3.4.3 China's ODI in the infrastructure sector

The cost for Chinese enterprises to invest in the infrastructure sector is up to 50% less than it is for their European and American competitors. At present, Chinese investors are interested in water storage projects, especially hydro-dam construction projects in Southeast Asia and the Middle East, including the Stung Cheay Areng Dam on Cheay Areng River in Cambodia, the Shweili Dam Project in Myanmar, the Aswan Dam Project in Egypt, and others. Although dams and water reservoirs will generate agricultural benefits, they also create an impact on the local environment and society. It should be noted that the investor and property owner of dam projects are usually the host country governments rather than Chinese enterprises, which are mainly involved in construction and finance. For those mid- and small-scale hydropower projects with a capacity below 60 MW, Chinese investors are the key players as developed countries have decided not to explore this market. As a result, Chinese project builders are often the target of media and NGO criticism when in fact the responsibility for the project is mostly in the hands of the host countries, and only very rarely in those of the Chinese investors and contractors.

3.4.4 China's ODI in the forestry and agriculture sector

Old growth forest exploration causes loss of native forest-related biodiversity and promotes the disappearance of local culture. A Chinese enterprise built agro-forestry projects in the "Golden Triangle," an area on the boundary between Thailand, Burma, and Laos, to help replace the opium-based economy with cash crops and commercial timber. This ODI project is killing two birds with one stone, as it aims to control the drug flow into China while cracking down on drug abuse in the host country. There are approximately 40 Chinese enterprises (including eight major rubber companies) operating in Northern Laos under the guidance of anti-drug policies.

A positive management model in forestry will also promote the healthy development of the forest ecological system. For instance, a Chinese enterprise in British Columbia, Canada,

has harvested mature and post-mature forests in compliance with the law regarding reforestation, thereby meeting governmental standards[①]. Managers of Chinese enterprises have gradually grasped the complex nature of the forest ecological system, and the activities of Chinese enterprises have also triggered extensive interest among local residents in the forestry sector. Take another Chinese enterprise in Russia for example. After purchasing the Far East Forest company in Russia, it managed the firm's logging activities through sustainable harvesting methods which reduced the amount of waste wood logged annually; and recycled low-value wood for sawdust and chips for pulp/paper making, thereby enhancing the efficiency rate of the resources. Similarly, two Chinese enterprises have located their headquarters respectively in Indonesia and Brazil and built overseas factories to process wood into pulp. Lands for cultivation of the timber supplies are secondary, low-return, and infertile forestlands where the wood coverage is below 20 m^3 per acre. These enterprises conscientiously fulfill their pledge to protect biodiversity in high conservation value forests as in all typical forest ecosystems.

3.4.5 Field trip research in Indonesia, South Africa, and Zambia

In order to get first-hand information, the Task Force carried out field trips to Indonesia, South Africa, and Zambia. In general, China's ODI seemed to be greatly appreciated by local governments. It is also welcomed as China's ODI is also seen as an opportunity to help achieve local sustainable development targets. Both the scope of trade and investment as well as its rapid pace of development have accelerated greatly in recent years, placing new challenges before China's ambitions.

In Indonesia, China's ODI enterprises have demonstrated some very good practices, which have led to the construction of new schools, new housing developments, hospitals, and road infrastructure. However, when compared with other ODI, China's investments are generally less well accepted than western investments. They often rank lower than even Indian and Japanese investments. One of the reasons seemed to be that Chinese investors rarely invest downstream into the markets when they are exploring for minerals or oil, for instance. They will extract the resources and ship them away. Indian investors, for instance, are more inclined to build fertilizer plants or LNG bottled gas distribution networks downstream from a natural gas plant or refinery. Indian investors integrate more into the economy and society. SMEs' improper practices are generally responsible for damaging the reputation of China's ODI, although certainly problems are not restricted to SMEs. The lack

① Prof. Sun Siheng, State Forestry Administration, *A Guide on Sustainable Management and Utilization of Oversea Forest by Chinese Enterprises*, Published on 8 September, 2010.

of communication by some Chinese ODI enterprises, large and small, and their tendency to live in an isolated way inside the host communities are further reasons why some have difficulty in gaining acceptance and admiration. The case of Indonesia was somewhat different as the team observed many instances where Indonesians, Indonesian-Chinese and Chinese overseas entrepreneurs share common cultural roots, cuisine, and living habits, which did, in fact, facilitate dialogue.

In South Africa and Zambia, the image of China's ODI also aroused a lot of concerns. The Task Force team visiting South Africa read about media stories denouncing the behavior of bad "Chinese" investors. Indeed, it was later discovered that they were Asians, but not Chinese. China is far away from Africa and so the lack of cultural communication led to many misperceptions and caused needless stress. Most of China's ODI enterprises are state-owned enterprises running under a top-down management system. While they do not develop sufficient connections with other local powerful organizations, such as the labor unions, other stakeholder groups, or NGOs, they pay greater attention to maintaining good and strong relations with local government representatives. The lack of communication with these local community and social organizations is one of the great hurdles faced by China's ODI enterprises. China's ODI enterprises should be better equipped to overcome such hurdles before going global.

3.5 Conclusion

China's investment process should not be purely profit-driven; it should also aim to improve local employment rates, promote local sustainable development, and protect the local environment while still respecting the host country's cultural traditions and social norms. Besides improving the quality of products and services exported, China should pay more attention to job creation, enhancement of local benefits and protection of the local environment, community, and wildlife. Some major Chinese enterprises are very much aware of the environmental and social impacts on investment destinations while some medium- and small-sized enterprises still fail to address such issues due to lack of attention, limited resources, and poor capacity.

Thus based on case studies and on the literature available on China's ODI, we see that good environmental and social performance as well as environmentally damaging behaviors indeed co-exist in China's ODI. The reduction of negative environmental and social impacts of China's trade and investment must rely upon joint efforts of China and host countries. It is therefore important to enhance the sense of social responsibility of overseas enterprises through education and training, and to design with the appropriate authorities legitimate guiding principles for

overseas environmental protection and social responsibility so that sustainable development would be ensured in the communities where Chinese ODI is absorbed.

4 International trade and the green shift

4.1 International trade: current conditions and future trends

4.1.1 The current state of international trade

China has performed very well in international trade since the process of reform began over 30 years ago. Total trade volume has risen to number one in the world, increasing from USD 20.64 billion in 1978 to USD 2.97 trillion in 2010[①], representing an average annual growth rate of 16.8% The export volume increased from USD 9.75 billion in 1978 to USD 1.58 trillion in 2010, at an average annual growth rate of 17.23%; the import volume increased from USD 10.89 billion in 1978 to USD 1.39 trillion in 2010, at an average annual growth rate of 16.37%. The gap between imports and exports was USD -1.14 billion in 1978 and USD 183.1 billion in 2010 (see Figure 8). Nearly half of China's economic activity is related directly to international trade (49.45% in 2010).[②]

Recommendation: China should align its trade, energy, and environmental policies in order to send consistent signals about its use of market mechanisms and economic policies to promote energy savings and emission reductions.

See Section 6 for more discussion about this recommendation.

The nature of China's international trade is fluid as it moves continually toward optimal performance. Chinese foreign trade has shifted from primary product exports to the export of light industry and textile products, to the export of mechanical and electrical products, and is currently shifting towards high-tech products. In 2010, the export of mechanical and electrical products by China accounted for 58.9% of the country's total export volume, 3.1 percentage points higher than in 2005 [③].

The proportion of primary products exported relative to other types of products has been dropping, from 50% in 1980 to 5.18% in 2010. Since 2002, the proportion of primary products in total imports has been rising, from 16.7% in 2002 to 31% in 2010 (see Figure 9).

The nature of international trade in China has also changed. In the early years of reform,

① Source of data: *Statistical Abstract of China in 2011*
② Source of data: *Statistical Abstract of China in 2011*
③ Source of data: *Statistical Abstract of China in 2011*

China's imports and exports mainly comprised general trade. Processing trade (the trade of raw materials and components that will be used in the production of finished goods) has been rapidly expanding since then, exceeding the growth of general trade (see Figure 10). For example, general trade exports accounted for 94.5% of total exports in 1981, and general trade imports accounted for 92.5% of total imports. After 1981, the proportion of general trade in total trade gradually declined and by 1993, general trade accounted for 47% of total exports, and 36.6% of total imports.

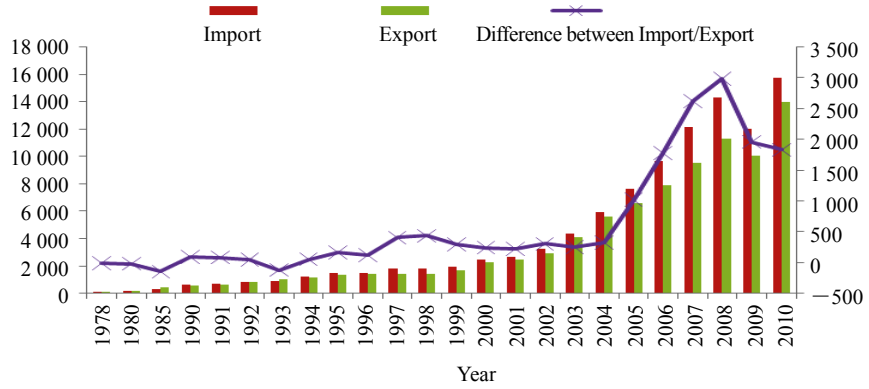


Figure 8 China's Exports, Imports, and Trade Surplus (USD 100 million)

Source: *China Statistical Yearbook 2010* and *Statistical Abstract of China in 2011*.

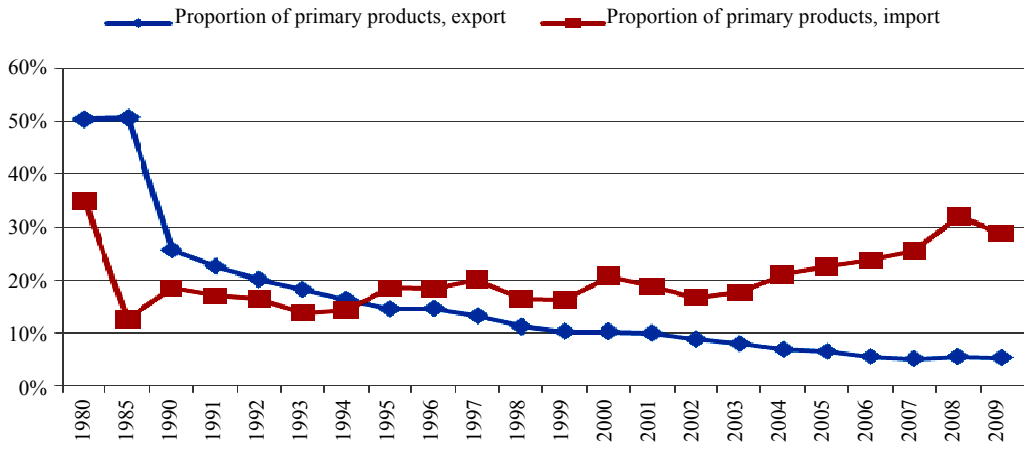


Figure 9 Proportion of Primary Products in Import and Export

Source: Statistical Yearbooks.

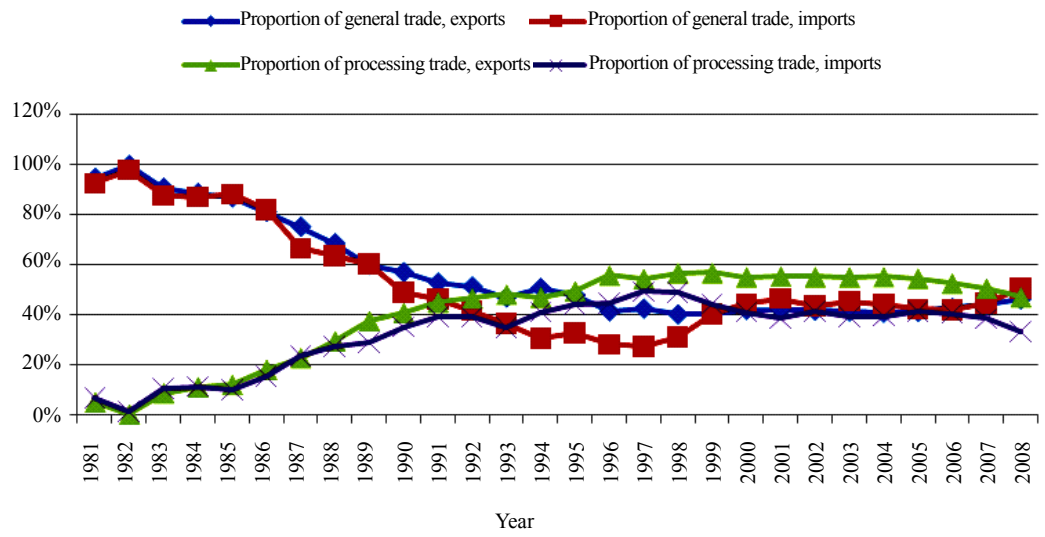


Figure 10 Proportion of General and Processing Trade

Source: China Statistical Yearbooks.

4.1.2 Environmental implications for Chinese foreign trade during the "12th Five-Year Plan"

During the period of the Twelfth Five-Year Plan (2011–2015), China's foreign relations will become increasingly complicated and will be confronted with multiple and changing challenges. Environmental matters will be an important element, but by no means the only issue. Climate change poses new challenges for economic development and trade expansion in China. On one hand, a commitment to energy conservation and emission reductions must take into account China's ability to develop; on the other hand, border measures such as carbon tariffs that developed countries may adopt could directly affect China's export competitiveness, which, in turn, would affect China's attractiveness for export-oriented foreign investment.

During the period of the "12th Five-Year Plan", China will enjoy obvious advantages in terms of production scale and large domestic market and it should remain as a global manufacturing center even with rising labor costs, environmental pressures, and the rise of other developing economies. It can be presumed that China will seek various ways to sustain its strong foreign trade and economic performance. Some of the more significant ways are to:

(1) Maintain a reasonable rhythm and scale of foreign trade development, aiming to keep the growth rate higher than the average growth rate of GDP.

(2) Enhance the international competitiveness of its service sector to realize the benefits of coordinating the development of manufacturing exports and service exports.

(3) Develop emerging markets and achieve export diversity within them, while maintaining a foothold in developed markets.

(4) Address trade frictions as one way to create an excellent trading environment.

(5) Upgrade its position in the global supply chain and improve its import and export product structure.

(6) Enhance its competitiveness in the trade-related service industry to extend its presence in the value chain.

(7) Rationalize the foreign trade system, by further improving policy measures such as tariffs, export rebates, and policy finance.

(8) Advance the sustainability of foreign trade through environmental protection.

There are a number of ways to bring trade and environmental matters into the "12th Five-Year Plan" period. China could:

(1) Continue to restrict the export of goods that consume too much energy, create high levels of pollution, or consume too many resources.

(2) Address the challenges created by climate change problems and transcend technical trade barriers. China's import and export activities are better than domestic production activities on the whole in terms of energy consumption and carbon dioxide emissions.

(3) Step up efforts to import, where necessary, and to export, greater quantities of environmentally-friendly technologies, equipment, and services.

(4) Promote and strengthen international cooperation in developing environmental technologies.

(5) Rationalize resource and energy prices, strengthen environmental protection and ensure that the prices of exported products fully reflect the costs of resources and energy, and fully account for environmental impacts.

Of course many of these ideas have been either introduced or thought about in previous years. The point now is that the challenges are very likely to be more significant in the years ahead and the need for addressing trade-related environmental matters more urgent.

4.2 Changes to the trade structure: an environmental perspective

The relationship between trade and environment is multi-dimensional and complicated. It is generally thought that the environmental impact of international trade on the

environment and on society is comprehensively reflected through scale effects, structure effects, and technology effects. These effects could result either in improvement or deterioration of the environment. However, the important factor is whether a sound market and effective management are present. To analyze the impact of foreign trade on China's environment, this report refers to the input and output tables of 34 departments in 2002 and 2007 and energy consumption data of relevant departments. According to their energy consumption intensity, industries were classified into high-energy consuming industries, medium-energy consuming industries, and low-energy consuming industries, and we further analyze import and export structures and their changes according to the intensity of energy consumption.

From Table 2, it can be see that in 2007 the export volume of products of high-energy consumption was USD 197.2 billion, accounting for 16.21%; the export volume of products of medium-energy consuming industries was USD 275.6 billion, accounting for 22.66%; the export volume of products of low-energy consuming industries was USD 743.9 billion, accounting for 61.14%. Relative to 2002, the proportion of products of high-energy and low-energy consuming industries in total exports increased, while the proportion of products of medium-energy consuming industries in total exports decreased.

Table 2 Distribution of Exports and Energy Consumption in 2002 and 2007 (USD 100 million)

Sector	2002		2007	
	Export volume	Proportion (%)	Export volume	Proportion (%)
High-energy consuming industries	487.65	15.05	1,971.68	16.21
Medium-energy consuming industries	908.42	28.03	2,756.50	22.66
Low-energy consuming industries	1,844.70	56.92	7,438.70	61.14
Total	3,240.78	100.00	12,166.88	100.00

Source: Input-Output Tables of China in 2002 and 2007, calculated by Li Shantong and the team for topic 1 of the Task Force.

From Table 3, we can see that in 2007, the import volume of products of high- energy consuming industries was USD 283.2 billion, accounting for 29.70%; the import volume of products of medium-energy consuming industries was USD 171.4 billion, accounting for 17.97%; and the import volume of products of low-energy consuming industries was USD 499.1 billion, accounting for 52.33%. Relative to 2002, the proportion of imports of products of high- and medium-energy consuming industries both rose to some extent while the proportion of products of low-energy consuming industries decreased.

Table 3 Distribution of Imports and Energy Consumption in 2002 and 2007 (USD 100 million)

	2002		2007	
	Import volume	Proportion (%)	Import volume	Proportion (%)
High-energy consuming industries	811.50	27.81	2,831.71	29.69
Medium-energy consuming industries	512.05	17.55	1,714.08	17.97
Low-energy consuming industries	1,594.77	54.65	4,990.28	52.33
Total	2,918.33	100.00	9,536.08	100.00

Source: Input-Output Tables of China in 2002 and 2007, calculated by Li Shantong and the team for topic 1 of the Task Force.

Over the period from 2002 to 2007, one can observe a clear shift in the export mix from low-tech to high-tech products. While low tech products have grown in absolute terms, they have decreased in relative terms. The proportion of natural resources coal, oil and gas) in total exports has fallen from 0.8% to 0.3% of exports, from 2002 to 2007, respectively. The same applies to traditional industries such as textiles, which fell from a 10% share of exports to 9% during the same period. Meanwhile the share of high-tech equipment (communication and computers) has gone from 19% to 25% (2002—2007).

On the imports side we see a slower shift. During the same period, coal related products and Oil & Gas have increased their share of imports from 0.12% to 0.26% and 4.3% to 8.4% respectively. At the same time textile products decreased their share of imports from 4.6% to 1.7%. The import share of communications, computer, and other electronic equipment increased, meanwhile, from 21% in 2002 to 23.4% in 2007. From the above, we can see that the import shares of resources and high-tech products are rising, while the import proportion of traditional products is falling.

4.3 Analysis of embedded pollutants in international trade

International trade has opened up global markets for China, allowing for a more extensive and effective allocation of resources and promoting the development of the domestic economy. At the same time, all stages of the export process can consume resources (energy) and emit pollutants, causing a huge impact on energy and environment of different countries, a matter that has increasingly drawn people's attention. The pollutants discharged during the processing, manufacturing, and transportation of goods are termed "embedded pollutants." Obviously, embedded pollutants are more significant than the pollutants emitted in the final consumption of a product. For example, the emission of embedded sulfur dioxide (SO_2) refers to all SO_2 emitted during the whole process of upstream processing, manufacturing, and transportation of a product, and the embedded SO_2 is larger than the SO_2

emitted in the final consumption of a product. In this report, an input-output model of multiple countries (regions) is used to estimate embedded CO_2 and SO_2.

4.3.1 Analysis of embedded CO_2 in international trade

4.3.1.1 Embedded CO_2 in Chinese trade in 2007 and 2002

International trade numbers hold large embedded CO_2 volumes. In 2007 the total embedded CO_2 in the trade surplus was 1.4 billion Mt or the equivalent of 23% of China's total CO_2 emissions. This corresponds to an increase of 200% over the 2002 embedded surplus number. Taking the export numbers, the situation is even more alarming as CO_2 emissions embedded in 2007 exports accounted for 33.26% of the same year's CO_2 emissions. Looked at it from another angle, embedded CO_2 in exports is equivalent to 3.29 times that of embedded CO_2 in imports.

The situation is just as acute if looked at from the standpoint of CO_2 intensity measures. The embedded CO_2 intensity in exports is 18.10 times greater than the CO_2 intensity embedded in imports. From an emission intensity measure, the embedded CO_2 emissions intensity per USD 10,000 in exports is 16.31 Mt, and the embedded CO_2 emissions of every USD 10,000 in imports is only 6.33 Mt. That is to say, embedded CO_2 emissions intensity in exports is 2.58 times more than the embedded CO_2 emissions intensity in imports.

Table 4 Embedded CO_2 in Chinese Trade in 2007 and 2002 (million Mt)

Year	Embedded CO_2 in exports	Embedded CO_2 in imports	Surplus
2007	1,984.3	603.2	1,381.1
2002	770.5	149.4	621

Source: Input-Output Tables of China in 2002 and 2007, calculated by Li Shantong and the team for topic 1 of the Task Force.

4.3.1.2 Sectoral analysis of China's exported embedded CO_2

We calculated the exported embedded CO_2 emissions of various sectors and arrived at the embedded CO_2 contribution of China's total exports. In terms of exports in 2007, the top four sectors in terms of volume were: communications, computer, and other electronic equipment (25.32%); machinery equipment and instrument manufacturing (22.08%); the textile and garment industry (15.58%); and the chemical industry (8.5%). These are also the top four sectors in embedded CO_2, accounting for 63.18% of the embedded CO_2 for all exports in 2007: machinery equipment and instrument manufacturing (24.73%); communications, computer, and other electronic equipment (16.10%); the textile and garment industry (11.34%); and the chemical industry (11%).

The sectors for which there was a rise between 2002 and 2007 in their proportion of total embedded CO_2 included: metal smelting and calendaring processing; metal products; machinery equipment and instrument manufacturing; communication, computer, and other electronic equipment; and transportation equipment manufacturing. The proportions of other sectors all drop to some extent from 2002 to 2007, mainly because of the increased export volume of the above-mentioned sectors. The same applies to the levels of embedded SO_2 in trade.

4.3.2 Analysis of embedded SO_2 in international trade

4.3.2.1 China's imported and exported embedded SO_2 in 2007 and 2002

The embedded SO_2 emission in China's 2007 trade surplus was 674.5 million Mt, equivalent to 31.52% of total SO_2 emissions in the same year. If one looks only at exports, SO_2 emissions embedded in exports accounted for 33.36% of total SO_2 emissions in 2007.

In terms of SO_2 intensity measures, the situation is just as serious. The emission intensity of embedded SO_2 for every USD 10,000 in exports is 0.0587 Mt, and the embedded SO_2 emission intensity for every USD 10,000 thousand in imports is only 0.0041 Mt. That is to say that embedded SO_2 emissions intensity in exports is 14.19 times greater than the embedded SO_2 intensity in imports.

Table 5 Embedded SO_2 in Chinese Trade in 2007 and 2002 (million Mt)

Year	Exported embedded SO_2	Imported embedded SO_2	Surplus
2007	713.98	39.44	674.54
2002	334.95	10.96	323.99

Source: Input-Output Tables of China in 2002 and 2007, calculated by LI Shantong and the team for topic 1 of the Task Force.

4.3.2.2 A sectoral analysis of China's exported embedded SO_2

Using the calculation formula of embedded SO_2, we can calculate the embedded SO_2 emissions of exports in various sectors in order to arrive at the embedded SO_2 contribution of China's total exports.

The top five sectors in terms of export volume in 2007 were: communications, computer, and other electronic equipment (25.32%); machinery equipment and instrument manufacturing (22.08%); the textile and garment industry (15.58%); the chemical industry (8.5%); and the metal products industry (5.5%), which were also the five leading exporters of embedded SO_2, accounting for 71.66% of the embedded SO_2 in all 2007 exports of 2007. Proportion of embedded SO_2 breaks down as follows: machinery equipment and instrument

manufacturing (22.23%); communications, computer, and other electronic equipment (16.17%); the textile and garment industry (12.89%); the chemical industry (12.69%); and the metal products industry (7.68%).

The sectors for which the proportion of embedded SO_2 in total embedded SO_2 rose from 2002 to 2007 were: metal smelting and calendaring processing; metal products; machinery equipment and instrument manufacturing; communication, computer, and other electronic equipment; and transportation equipment manufacturing. The proportions of other sectors all drop to some extent from 2002 to 2007, mainly because the of the increased export volume of the above-mentioned sectors.

4.4 Conclusion

In recent years, China's import and export volumes have been increasing substantially, reaching USD 2.97 trillion in 2010, and the total volume of imports and exports has soared to number one in the world. International market share has obviously improved, the market space for foreign trade will be more extensive, and product structure will continue to be optimized. In 2010, the export of mechanical and electrical products in China accounted for 58.9% of total Chinese exports, equivalent to a rise of 3.1 percentage points over 2005; in 2009, high-tech products accounted for 31.36% of the China's total exports, equivalent to a rise of 2.7 percentage points over 2005. A major shift has occurred in import and export trade patterns, with processing trade expanding rapidly, exceeding the growth of general trade.

Up until 2007, the proportion of high-energy consuming industries increased to some extent. The export volumes of products of high-energy consuming industries and medium-energy consuming industries accounted for 16.21% and 22.66% respectively. Relative to 2002, not only did the export volume of high-energy consuming industries increase, but so did the proportion of high-energy consuming industries against total exports, from 15.95% to 16.21%. The import volume of products of high-energy consuming industries and medium-energy consuming industries accounted for 29.70% and 17.97% respectively. Relative to 2002, not only did the import volume of high-energy consuming industries increase but so did the proportion of high-energy consuming industries against total imports, from 27.81% to 29.69%.

Though there is a large surplus in China's foreign trade; it is often based on high-energy inputs and high-pollution products, which account for a substantial proportion of embedded energy and emissions in the exported products. Energy efficiency in China is low, so a large amount of energy is embedded in exported products and a large amount of pollutants remain

in China, thereby increasing pressure on China to address energy conservation and environmental protection.

This research adopted the computational general equilibrium (CGE) model to analyze how environmental policy is used to optimize industrial structure, investment and trade structure, as well as the impact on the environment. The simulation results show that environmentally-friendly economic policies will cause some reduction of trade, but the impact on exports will be greater than the impact on imports. Mainly the energy sector and energy-intensive manufacturing industries will be negatively affected by such policies, thus shifting trade to a lower-carbon reality.

5 China's participation in international rule-making to promote environmental protection

5.1 The development of relevant international rules

Domestic policies and international rules regulating trade and investment generally complement each other. In the international arena there are a number of bilateral and multilateral agreements that regulate international investments activities, as well as international trade agreements negotiated under the WTO or free trade agreements (FTAs) that govern the international exchange of goods and services. On the environmental side, international relations are governed by specific environmental protocols, conventions, and agreements.

China is no longer just a passive member of the international rule-making process; it is gradually adopting a major position in these processes, whether or not it wishes to be. This is a reality of being such an important player. As it takes part, China faces the challenge of safeguarding its own interests while contributing to the improvement of global governance in general.

China also faces a growing number of trade disputes, with a substantial number related to environmental protection. For example, the export of Chinese energy-saving rights generated high anti-dumping duties levied by the EU[①], and subsidies directed towards alternative energy development were subject to the anti-subsidy investigations of the US[②]. Likewise, China's heavy restrictions on the exports of coke resources were opposed through

① Xinhua News: The Case of Chinese Exported Energy-saving Bulbs Reflects Conflicts of anti-dunmping policy inside of EU.31 Aug 2007.

② New York Times: "US to Investigate China's Clean Energy Subsidies", 15 Oct 2010. http://www.nytimes.com/.

EU and US lawsuits[①], despite the self-sacrificing nature of these restrictions.

5.2 Environment provisions in international investment agreements

5.2.1 An overview of global investment governance

While transnational investments are developing rapidly, the global governance framework of agreements and regulations to govern them is lacking in general. The total annual amount of FDI should reach USD 1.3 to 1.5 trillion in 2011.[②] However, currently in the field of international investments, there exists no single multilateral legal framework. The current transnational investment governance system is based on a multitude of bilateral and regional international investment agreements (IIAs). The number of IIAs has increased rapidly during the past 20 years, especially during the 1990s China has endorsed 230 international investment agreements of which 125 are bilateral trade agreements.[③]

5.2.2 Environmental provisions in international investments rules

The incorporation of environmental issues into intergovernmental investment agreements is a new trend. Article 3 of the WTO's Trade-Related Investment Measures (TRIMs) requires that all the exemption articles in the text of 1994 of the General Agreement on Tariffs and Trade (GATT) shall apply to TRIMs. This means that the general exemptions of Article 20 of GATT are also binding on the environmental issues in international investment. [④]

The most important agreement-based environmental initiatives took place under the North American Free Trade Agreement (NAFTA) framework, launched in 1993. Since then, despite disagreements on allocation of funding resources and the use of the CEC (NAFTA Commission on Environmental Cooperation), the three main NAFTA member countries—the US, Canada, and Mexico—have all generally become active advocates for the

① Financial Times："US lodges WTO case against China"，June 23 2009. http://www.ft.com/.

② UNCTAD. (2010). *World Investment Report 2010: Investing in a low-carbon economy*. New York and Geneva: United Nations. July, 2010.

③ UNCTAD. (2010). *World Investment Report 2010: Investing in a low-carbon economy*. New York and Geneva: United Nations. July, 2010.

④ The articles relevant to WTO rules and environmental protection are mainly concentrated in the paragraphs (b) and (g), Article 20 of GATT. Based on the provisions of the General Exception of GATT, 1994: "Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, nothing in this agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures: (b) necessary to protect human, animal or plant life or health; (g) relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption."

incorporation of environmental provisions into bilateral trade agreements. Some European countries, such as Finland, Sweden, Luxembourg and Belgium, are now also participating in this trend.

The major modes of incorporating environmental provisions into FTAs and bilateral trade agreements include: preamble clause; special environmental provisions; environmental exceptions and exemption articles; articles of dispute resolution procedures; and articles addressing the relationship between investment agreements and environmental agreements. In general, the environmental provisions revolve around disclaimer articles allowing members to make exceptions for environmental and health reasons; articles prohibiting members from loosening environment standards in order to stimulate FDI; articles demanding that members respect host country environmental rules and regulations, and so forth.

5.2.3 Environmentally-relevant international investment rules: China's participation

The incorporation of bilateral environmental provisions into trade agreements is a practice that has been actively promoted over the past decade by the US and other developed countries. This may become an important trend that China should follow as it negotiates its own new agreements. Many older IIAs do not include articles that coordinate the relationship between international investment and the environment. By comparison, the China-New Zealand, China-Chile, China-Pakistan FTAs already include environmental protection as an integral part of the agreements.

5.3 Environmental provisions in international trade rules

5.3.1 Overview of international trade rules and international environmental rules

The goal of international trade rules is to enhance the liberalization of economic activities. In contrast, the goal of environmental management rules often seems to be to restrict aspects of economic activities. While the two are fundamentally different they can influence each other significantly. Special effort is required to reconcile and combine the objectives within common agreements.

Recommendation: China should play a more active role in rule-making in relation to international, regional, and bilateral trade and investment arrangements in order to help promote green transformation. In addition to various legally-binding standards and agreements, this might include creation of a *Green China Consensus* on various voluntary standards where industrial and service industries and associations need to reconcile international and Chinese interests in establishing green certification systems.

See Section 6 for more discussion about this recommendation.

The environmental provisions in the existing international trade rules are basically those of the WTO. Most of the other regional trade agreements (RTAs) and FTAs—with a few exceptions, such as NAFTA—generally have no independent environmental provisions. Except for the 3 FTAs mentioned above (NZ, Chile and Pakistan), China has already endorsed bilateral and multilateral FTAs with more than 30 countries, in which trade has not been linked with environmental issues. In most cases environmental cooperation usually appears as the appendices of FTA protocols.

At the same time, the multitude of international environmental conventions does not completely exclude trade development, and some of them have actually established "trade and environment commissions," specified by Specific Trade Obligations (STOs). They regard trade as an important means of implementing environmental conventions. For example, in the CITES Conventions, such trade measures as the banning of trade of elephant tusks have been adopted.

5.3.2 Environmental provisions in GATT and other trade agreements

Environment-related agreements made outside GATT include: ① the Agreement on Technical Barriers to Trade (TBT); ② the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS); ③ the Agreement on Subsidies and Countervailing Measures (ASCM); ④ the Agreement on Agriculture (URAA); ⑤ the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS); and ⑥ the General Agreement on Trade in Services (GATS).

5.3.3 Possible environmental provisions in future WTO agreements

In 1995, at the beginning of WTO's existence, the Committee on Trade and Environment (CTE) was established under the General Council and discussions were conducted on environmental issues. Today, environment remains a major topic in the WTO's Doha Round. It includes (sections 31 and 32 of the "The Doha Ministerial Declaration"): the relationship between the WTO multilateral trade rules and Multilateral Environmental Agreement (MEAs); reducing or abolishing the tariff and non-tariff barriers of trade in environmental goods and services; the impacts of environmental measures on market access; trade and environmental issues in the negotiations of intellectual property agreements; and eco-labelling.

5.3.4 WTO rules on environmental products: China's active role

China should play an active role in making international rules in terms of its WTO

based environmental interests. The current WTO-CTE's environmental goods and services (EGS) negotiations are driven by trade interests rather than environmental ones. They are based on national agendas, and therefore lack a global perspective and are quite poor in terms of any coordination with Multilateral Environmental Agreements (MEAs). They lack an integral awareness of China's national and departmental interests, suggesting that the country's environmental interests have not been sufficiently considered. Hence, it is suggested that China should better prepare its international negotiations strategies to gain environmental benefits alongside its trade and industrial development interests.

In light of the diversity and complexity of China's economic development and the urgency of environmental needs, it is necessary to discard the too simplified dichotomy of international trade for developing countries and developed countries. The environmental goods and services listed by this study reflect China's economic benefits (industrial benefits and trade benefits); environmental benefits; and social benefits. China is especially competitive in all three categories of environmental products, and will become more competitive over time. There are also interesting alignments of interests to be explored with other developing countries.

5.4 Climate change, international investment, trade, and China's involvement

5.4.1 International climate process and system

Global climate change has been a fixture in international headlines in recent years, but still the challenge of construing of a fair and effective international climate change response after 2012—the end of the Kyoto Protocol commitment period—is still far from resolved. The international climate system involves a wide range of processes, frameworks, and mechanisms characterized by statements, laws, agreements, decisions, and standards. Some are legally binding; others are voluntary. Some countries have attached great importance to the commitments made at various international climate meetings, and have indeed change domestic policy to reflect them.

It is obvious that climate change would have implications for international investment, trade, and indeed the global economy. Climate change could alter the comparative advantages of some countries, and climate policies adopted by some countries could potentially alter the scale, flow, and direction of international investment and trade. On the other hand, certain international investment and trade policies could enhance international climate actions, but might also impede them. During the course of the global shift to green economy, there will certainly be unavoidable friction surrounding the relationship between

climate change and investment policy. This calls for the thoughtful coordination of the international climate system with international investment and trade rules.

5.4.2 Climate change and international investments

The climate change system depends on financial resources that it doesn't have to be properly implemented. This chronic lack of funding has deepened the distance between developed nations—which promote market-based mechanisms—and developing nations, which typically promote public funding sources. More recently, developed countries have pledged to provide USD 30 billion during the start-up phase (2010–2012) as well as a long-term goal of raising annually USD 100 billion by 2020 and the establishment of a "world green fund." So far, none of these pledges have been honored and the international carbon markets have also not yet been formed. So climate-related investments are still being implemented more on a voluntary basis than on a mandatory basis. Currently, there are no direct provisions to standardize international low-carbon investment. The incorporation of such international investment policies into the international climate system presents an opportunity for future development.

5.4.3 Climate change and international trade

The impacts of climate policies on international trade are of great concern to the international community as they can lead to serious competitiveness issues and trade frictions around, subsidies, carbon tariffs, the liberalization of low-carbon products, and other contentious issues.

Based on the United Nations Framework Convention on Climate Change's (UNFCCC) principle of "common but differentiated responsibilities," developed countries and developing countries should assume different emissions reduction obligations. In terms of carbon leakage and competitiveness, developed countries in Europe and America have proposed to address the developing countries' competitive advantages in international trade and increased emissions to be compensated through carbon tariffs and other offsetting measures. These include the EU's decision to incorporate aviation emissions into the EU's trading system (EU–ETS) in 2012, a unilateral action that has caused great dispute in the international community and which will seriously affect China's aviation industry. The legitimacy of carbon tariffs under the WTO remains undetermined. Developed and developing countries have different positions, and there exist different opinions even within the EU. This could all lead to potential conflict at the intersection of the international climate system and international trade rules.

5.4.4 China's status, role, and strategic choices

As it evolves from being a recipient to a contributing country in the climate regime, China is the largest stakeholder in the debate. China has considered enhancing South-South cooperation on climate change by providing funds through bilateral channels. China's FDI is increasing rapidly while the state vigorously strengthens energy-saving programs, emissions reduction measures, and policies to promote low-carbon development and investment.

China's image as the "world's factory" cannot be altered overnight. The net export of embedded carbon emissions in Chinese trade still accounts for about one-fifth of China's total carbon emissions. Internationally, most of the comments about carbon tariffs are directed at China as many believe that China has been reluctant to adopt "effective" climate policies. To strengthen its economy, bolster its image, and advance a global green shift, China must participate actively in the development of a viable international climate system and should attach great importance to the interaction of international rules on climate change, international investment, and trade.

6 Policy recommendations: ideas for a greener future

6.1 Overview

China now has the second largest GDP in the world but still faces many social and environmental hurdles typical of emerging economies, both domestically and internationally. Its economic transition offers many opportunities for growth and positive transformation. China has chosen to address its environment and development challenges head-on, thus opening the potential to secure its own sustainable future and to contribute to global sustainability. Investment and trade need to be at the forefront in meeting these challenges.

China is the world's largest buyer of many internationally traded commodities as well as the main exporter of a number of manufactured essential goods. China's integration with the global economy is demonstrated by the increase in its investments abroad, in Latin America, Africa, and the ASEAN Region, among others. China is thus exposed to growing public scrutiny and constant examination about its actions and policies affecting its business interests both at home and abroad. As a global player, it is also tied to its international commitments, general engagements, alliances, and integrated domestic development plans.

Domestically, China is adopting policies and encouraging voluntary measures that will drive it towards a green economy and lowering its carbon emissions. The Government of China is imposing stricter environmental conditions on industrial and other sectors during

the "12th Five-Year Plan" (2011–2015). There are implications for the activities funded via foreign direct investment (FDI). And since Chinese outward direct investment (ODI) is expanding rapidly, some structural adjustments in its trade and foreign investments policies will be needed to address environment and development matters related to topics such as accessing, processing, and transporting natural resources; infrastructure development in other countries; and manufacturing or other industrial activities carried out abroad.

Environment and trade continues to be a difficult subject with a constant need to monitor and address impacts of trade agreements on the environment; and to ensure international environmental agreements do not create competitiveness or other barriers to trade. With the rise of bilateral and regional trading agreements signed by China, there are additional opportunities to ensure its trade is carried out with due regard for environment and development within China and with its trading partners.

The Investment, Trade, and Environment Task Force (TF) has examined various aspects of China's FDI and ODI; considered corporate social responsibility (CSR) on the part of Chinese firms operating domestically and abroad; and examined some current aspects of trade and environment policies. The TF members carried out interviews and observed relationships involving Chinese investments in two regions: Southern Africa and Southeast Asia (Indonesia). The resulting recommendations are intended to be pragmatic measures that could help China to fulfill its commitment towards achieving healthy and sustainable development within China and to provide sustainable benefits for other countries in the process.

In addition to the specific topics covered below, the TF wishes to make an overarching policy recommendation (Section 6.2) concerning the shift in trade and investment circumstances in which China finds itself.

6.2 Environment and development policy for China during its investment and trade transition

China's actions on trade, FDI, and ODI affect the economy and ecology globally and within other countries in an ever-increasing fashion. China can ill-afford a passive attitude in dealing with other countries and the global community if it is to achieve optimal and sustainable patterns of development, including mitigation of the current problems of excessive damage to its own environment. The future of China's "international brand" will have to be green for the country to thrive.

Therefore:

China needs to take proactive positions regarding environment and development that

will: ① ensure that those investing within China operate at the highest standards of CSR; ② secure goodwill and the right to operate in countries abroad for Chinese ventures, based on the quality and style of investment and benefits for local people; and ③ seek bilateral, regional, and international trade, environment, and other agreements that take into account Chinese interests and concerns for a green economy, and indeed, for the transition to ecological civilization. China should aim to be an open and declared advocate in developing and promoting international green transformation.

The positive attitudes and action China has shown towards the environment, especially during the 11th and now the "12th Five-Year Plan", position the country and its businesses very well. However, it will require a concerted effort to capitalize fully on the opportunities, including addressing significant perception issues—and the stakes are high. China should hold both its FDI and its ODI to consistent, high standards of performance. It is essential not to behave one way at home and another abroad.

6.3 Policy recommendations on investment and environment relationships

The approach suggested here aims to upgrade the quality of China's FDI (Section6.3.1) and ODI (Section 6.3.2), and to create symmetry between them where possible so that China's aspirations and requirements for inclusive growth are met while its international brand is enhanced. Since much of the effort will be undertaken by enterprises operating domestically and/or internationally, voluntary efforts need to be fostered and enabled. Thus Section 6.3.3 deals with CSR policy needs.

6.3.1 Foreign direct investments (FDI) into China

China should use FDI to help promote China's green transformation and sustainable development by ensuring a more balanced sector and regional distribution of FDI, with environmental concerns dealt with in a consistent manner.

More specifically, China should:

(1) Update and modernize its investment policies to attract desirable FDI into key sectors, such as high-tech, environmentally friendly, and other strategic emerging industries, thus helping China meet its "12th Five-Year Plan" environmental targets.

This means shifting from the current emphasis on scale and speed of foreign investments towards quality. To hasten this shift, China should adopt fiscal, taxation, and financial incentive policies, consistent with the Decision on Accelerating the Fostering and Development of Strategic Emerging Industries of the State Council, October 2010. Such incentives can also be introduced to attract FDI to the western region and inland cities away

from the coastal areas as long as they lead to appropriate environmental safeguards in these other areas.

(2) Draw on the environmental experience of FDI source countries, especially those countries requiring compliance with high environmental standards of their own, to modernize and further upgrade China's legal framework on FDI.

Under such a legal framework, both foreign and domestic industries operating in China should minimally be subject to identical Chinese environmental protection and enforcement rules, regardless of whether the investors are foreign or domestic.

(3) Encourage all enterprises to invest in green products and services where possible, and to promote the greening of market supply chains across sectors.

The existing Catalogue for Guidance of Foreign Investment Industries should be revised to create incentives for greener investments. The Chinese environmental impact assessment requirements should be applied equally to, and be enforced for all investment activities in China, whether carried out by foreign or domestic companies.

(4) Evaluate local government performance by using indicators that place greater emphasis on the quality of FDI, particularly with regard to environmental performance and technological progress.

6.3.2 China's outward direct investment (ODI)

China should focus its ODI not only to play a significant role in meeting China's "12th Five-Year Plan" targets, but also to promote host country green development and transformation, in line with objectives defined by the host nations, the Millennium Development Goals, and other relevant international sustainable development objectives. China should articulate and expand its policy guidance for enterprises that are "going global," so that its ODI is consistent with China's green development vision.

China's ODI is generally welcome worldwide. Yet this ODI is often subject to criticism especially if it is perceived to be ill prepared and badly introduced. An ODI approach based on green development can be designed to allow China to maintain its economic growth path, while ensuring that its overseas commercial activities are socially responsible and environmentally sustainable, with strong benefits for the local population and economy in the host country. China's SOEs (state-owned enterprises) can lead the way in demonstrating this positive behavior.

More specifically, China should:

(1) Prepare Chinese enterprises engaged in "going global" to take a proactive role in green development of host countries and in properly addressing environmental and social

impacts.

There is always scope for improving the sustainability performance of business, and China should encourage its ODI along this path, while systematically improving its communication of good practice to overcome stereotypes and prejudices. China's ODI is likely to play a major positive role in the green transformation of host countries, especially other developing nations.

China's ODI should work towards a better integration with host country societies and should seek alignment of interests with local stakeholders, improving the products and services offered to host countries, and placing greater emphasis on environmental stewardship and sustainable development. Such actions will require better investor preparedness, implementation on the ground, and communication. Transparency will help protect Chinese investment interests through better relationships with local stakeholders, their business community, and citizen representatives. These steps will support the broader imperative of securing host countries' trust,if done properly.

(2) Establish new platforms for ongoing dialogue on implementation issues between China and countries with which it is creating trade and investment relationships.

This need, articulated by various representatives of each of the three countries visited by the Task Force, should facilitate communication and mutual understanding of needs, objectives, and concerns around the impacts of Chinese trading and investment activities abroad. Preferably, these platforms should be agile and flexible, created alongside or outside the traditional and more formal international venues, such as the Forum on China-Africa Cooperation (FOCAC) and the ASEAN Plus One Forum. The dialogue platforms should facilitate unencumbered two-way communication on a broad range of topics of interest to the countries. The dialogue channels should help build understanding, enhance business exchanges, and facilitate resolution of environmental, educational, social, and other concerns related to ties with China. They should be accessible to citizens in the ODI host countries. They are urgently needed to address the various development hurdles around the adoption of new environmental standards that could be seen as trade and investment barriers if not disclosed and discussed in advance.

(3) Address the negative perceptions sometimes associated with China's ODI and trading activities abroad.

There are many possible reasons for such perceptions, including some rooted in substance and others in a variety of motivations. Certainly improving the existing situation is important. However the TF found that even where good examples of initiatives undertaken by Chinese enterprises exist, the host country general public is totally unaware of these cases.

All they knew and spoke of were the cheap and low quality products made in China, which were unfairly flooding their domestic markets, among other issues. While some of this negative image and perception of Chinese products in those countries can be countered by better information and communication campaigns, true success will require integrated strategies on the part of government working with Chinese enterprises.

These strategies should change some aspects of Chinese corporate behaviour, provide incentives for marketing and exporting better quality products and services to developing countries, and other changes noted in the previous recommendations. It will be necessary to involve governmental agencies as well as China's embassies, educational institutions, business associations, and non-governmental organizations. China can learn from precedents set by other countries and from the experience of some multinational enterprises that have satisfactory sustainable development records.

(4) Create an evaluation methodology that enables a better monitoring of its ODI enterprises, both large SOEs and SMEs, particularly with respect to their activities abroad, perhaps with regular rating of ODI enterprises in accordance with their CSR performance.

Such a common framework can build on, enhance, and align the relevant work of several public bodies in developing ODI-related environmental and social guidelines, notably MOFCOM, NDRC, SASAC, MEP, SFA, and the CBRC. The host country and China could evaluate and rate the ODI enterprises in accordance with their CSR performance. Such information could be made publicly available both domestically and to host countries. Those rated high on CSR performance might be provided incentives like tax breaks, preferential finance, or customs clearance access.

Evaluation should be based on a commonly-held information base generated by MEP, Customs, Industry and Commerce Administrative Agencies, Taxation Agency, CBRC, Chinese embassies, and consulates, and could potentially include credible civil society organizations in both China and hosting countries. China should start to exercise such oversight starting with its SOEs that are "going global." Reciprocity by other governments overseeing their own outward investors could be developed using the proposed dialogue platforms described above.

(5) Require under Chinese law that Chinese SMEs "going global" legalize their status in host countries. Also, ensure their access to capacity building for appropriately-designed operations abroad.

Chinese SMEs should be required to register with their local consulate or embassy any changes in business sector activities they have undertaken once they have moved abroad. This will help meet China's expectation for their actions abroad especially if backed up by

regular monitoring.

(6) Strengthen, align with green development, and clarify internationally the basis on which the Chinese government and its financial sector are willing to provide concessionary finance to host country governments or enterprises as part of China's trade and investment promotion, and to improve the efficiency of these activities.

This will demand consistency across its policy banks, joint stock banks, other lending institutions, and state-directed investment funds and vehicles.

6.3.3 Promote corporate social responsibility (CSR) for enterprises engaged in FDI or ODI

As a global player, China needs to work together with the international community and enterprises to guide FDI and ODI for the promotion of green transformation under non-discrimination principles.

China therefore should:

(1) Ensure, as a matter of principle and legal framework, that FDI into China and China's ODI should be held to a high standard of corporate social responsibility.

If the investing or host country is a developing nation with environmental laws and standards that are below internationally advanced ones, the FDI and China's ODI enterprises should at least meet Chinese law and standards.

(2) Establish a new *Guideline on Corporate Social Responsibility* that makes China's own standards consistent with internationally-recognized CSR elements.

This guideline should address some areas of environmental, social or sustainability performance that are not currently subject to Chinese oversight, and those areas currently regulated at levels below internationally recognized standards. The guideline should encourage good performance, with disclosure of environmental and social information by headquarters domestically and in host countries.

(3) Create Sustainable Development Funding Mechanisms to mitigate the impact of China's natural resource procurement activities, particularly when they result in depletion of non-renewable mineral, oil and gas, natural forest, and other biological resources, either domestically or abroad.

There are a number of such funds in the world, some of which have served to offer alternative development options to the populations affected by these extractive activities. Others have just created a savings account instrument to be used by future generations, when these resources will have been depleted. Such funds must be structured jointly between the host state, its local community, and the investor with strong stakeholder participation. They

can be capitalized through payment of royalties levied on the resources that are being explored and should be managed by third-party professionals as independent trust accounts, which must be accountable to the public and other related stakeholders, not just to the host government. The lessons learned from resource-depleted sites indicate that part of the proceeds from resource exploration must be reserved for on-site ecological restoration, industrial diversification, and local social development.

A number of successful examples may be useful models, such as the Norwegian Investment Fund for Developing Countries (Norfund) or the Alaska Permanent Fund Corporation (APFC). In most cases, these funds help improve the image of the investor as they are managed in full transparency and are subject to the interests of the community. Generally, revenues and dividends should be used to: diversify the economy of communities exposed to resource depletion; finance poverty reduction; and provide housing and education, improved medical services, environmental protection, green transformation, and other aspects of human and social development.

(4) Create awareness-raising and capacity building on the importance of the investment and environment nexus, whether via FDI or ODI. Chinese central and local governments should provide training for entrepreneurs so that Chinese companies are aware of, and equipped with, the necessary instruments for building image, reducing risk, and implementing CSR activities.

It is very important to encourage information exchange among companies, and to identify and disseminate good CSR practices of foreign investors in China as well as those of Chinese enterprises operating abroad. Training programs can be derived from these activities, and disseminated widely among all companies participating in investment flows both ways. Awareness of CSR among the Chinese public is also needed.

6.4 Policy recommendations on trade and environment (green trade)

China should align its trade, energy, and environmental policies in order to send consistent signals about its use of market mechanisms and economic policies to promote energy savings and emission reductions.

Better communication facilities and coordination among relevant ministries are needed to reduce policy conflicts, overlaps, and implementation gaps. This is essential to improve China's trade structure and accelerate the transformation of its economic development model towards sustainable development.

More specifically China should:

(1) Make greater use of market-based policy mechanisms in setting natural resource,

environmental services, and energy pricing.

Internalizing environmental costs with appropriate market mechanisms is essential for adjusting the foreign trade structure, as well as implementing energy-saving and emission-reductions targets. The government should accelerate the updating of the pricing mechanism of resources and energy products such as water, electricity, coal, oil, and natural gas. This will help to move the pace of structural reforms of the corresponding sectors, so that the prices of energy and resources reflect the degree of scarcity. Market mechanisms include: accelerating reform and the further establishment of resource taxation; reforming the environmental tax system; examining carbon taxes and carbon trade; and establishing resource compensation funds and sustainable development funds.

(2) Encourage and expand imports to promote a better trade balance.

China's trade surpluses are associated with increasing deficits of natural resources that are embedded in goods traded for consumption outside China. A large trade surplus can cause high embedded energy exports and serious pollution increases within China. The Chinese government should research its relevant policy options, such as lowering tariffs, to encourage the importation of high-energy products, and thereby help reduce domestic production levels. In other words, China could reduce export trade surpluses, promote the upgrading of domestic industrial structures, and move towards a real balance in trade, while fulfilling the double objectives of reducing domestic emissions and lowering domestic energy use.

(3) Shift to a more environmentally favorable export structure by offering guidance and policy incentives towards promoting the export of lower energy-consuming and less environmentally-damaging products.

Examples of specific actions on energy-saving and emissions-reduction actions related to export profiles include: classification of export products on the basis of total energy consumption and pollution emissions (including direct and indirect emissions) in the production processes; promotion of green certification and eco-labeled products; increase of export tax rebate for low energy-consuming and low-pollution products; cancellation of the export tax rebate policy of high-energy and high-pollution products; and implementation of an export tariff policy to high energy-consuming and high-pollution products.

(4) Invest in better national-level accounting and reporting to reduce the environmental impacts of its imports, mainly in terms of reduced energy and carbon intensity.

On the export side, and particularly for commodity exports (mined, harvested, and grown), China should adopt internationally-accepted standards to continuously re-evaluate the risks of resource depletion and environmental degradation related to these exploitation

activities. In general, it must manage its export sectors with a stronger focus on their pollution content and encourage environmental supervision of high-pollution export enterprises.

6.5 Policy recommendations on rule-making in relation to international, regional, and bilateral trade and investments

China should play a more active role in rule-making in relation to international, regional, and bilateral trade and investment arrangements in order to help promote green transformation. In addition to various legally-binding standards and agreements, this might include creation of a *Green China Consensus* on various voluntary standards where industrial and service industries and associations need to reconcile international and Chinese interests in establishing green certification systems.

More specifically China should:

(1) Continuously promote the enforcement domestically and internationally of international environmental treaties to which China is a signatory member.

Enforcement of existing agreements is often very weak in many parts of the industrial and developing regions. China should voice its concerns about international transfer of pollutants and wastes through international trade and investment. Such concerns should cover the overall impacts of international environmental treaties on competitiveness, employment, and environment at domestic and international levels.

(2) Take the initiative in including environmental and social clauses while negotiating bilateral or regional trade and investment agreements.

Such recommendations can include flexible and progressive implementation mechanisms, which take into account the development stage of each party, consistent with the trend adopted in these agreements in recent years.

(3) Encourage enterprises and organizations to examine international best practice on green transformation, and to identify and promote best practices in this area, whether inside or outside China. Develop *Green China Consensus* voluntary standards based on Chinese characteristics and promote these, especially for domestic use and, where appropriate and necessary, for equivalency with international standards. In some instances it should be possible to promote *Green China Consensus* standards as new international best practices.

Examples include certification for sustainable palm oil import, aquaculture exports, sustainable mining, and green tourism certification, among many others. Some of the standards will relate to emerging environment and sustainable development technologies arising from China's science and technology investments, for example on battery technology.

All such actions will also help improve the global perception of China as an important and dedicated advocate of sustainable development.

China's own standards organization should be tasked to look at international voluntary standards for environmental protection and sustainable development, and gradually help Chinese enterprise adopt or adapt these for domestic use with governance structures appropriate to China's conditions.

(4) Promote South-South-North cooperation within existing frameworks. China should explore the opportunities offered by its singular emerging-to-developed economic status to seek special joint development niches, where it can bridge and align common experiences and expectations of some of its less advanced international commercial partners with those of more advanced partners.

On climate change, for example, China can provide African countries with appropriate and affordable low-carbon technologies such as small hydropower, solar water heating devices, and household biodigesters; European countries can buy emission-reduction credits at low costs and cooperate with China on advanced technologies.

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