Chapter 8

China's Energy-Environment Problems and Some Issues Related to the Post-Kyoto Arrangement

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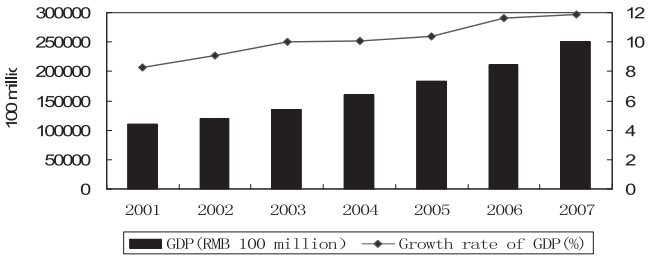
Introduction

China is a country with a large population, and by the end of 2007 this population had reached 1.321 billion or approximately one-fifth of the total world population. Since the beginning of reform and opening up, China has achieved rapid economic growth. The GDP of China in 2007 reached RMB 24.95 trillion with a growth rate of 13.0%, see Figure 1. With the in-depth implementation of reform and the gradual improvement of the socialist market economic system, China's social vitality and the development of China will be further stimulated. As described in *The Outline of the 11th Five-Year Plan for National Economic & Social Development of the People's Republic of China* (SCPRC, 2006), or the 11th FYP in short, the total population of China will be kept under 1.36 billion by 2010, and the annual growth rate of GDP will be maintained at 7.5 percent during the 11th FYP period to double the 2000 per capita GDP by 2010.

Figure 1 The GDP and its growth rate of China, 2001-2007.



Source: China Statistical Yearbook 2008

Undeniably, however, there are still serious problems in many areas of China's society and economy. China is, and for a long period of time, will remain in the primary stage of socialism with underdeveloped productivity and some deep-seated and long-term contradictions restraining her development. For example, the available arable land, fresh water, energy and important mineral resources cannot meet the demands, and the ecosystem is fragile. China is in the process of industrialization and urbanization, and it will take 20-30 years or even longer to accomplish the process fully. At present, the problems of rural areas, farmers and agriculture are extremely difficult and the employment pressure is also a major challenge. Meanwhile, the institutional obstacles that affect China's development need to be overcome urgently. In addition, the vast western provinces of China are still very poor, and there are significant differences in the economic development level of different regions; for example, Shanghai, ranking first in per capita GDP, enjoys a GDP 10 times greater than that in Guizhou province, which ranks last.

Therefore, China is thus still a developing country, and must make development the top pri-

ority. Maintaining a relatively high economic growth rate is an important principle of China's sustainable development policies; at the same time, some policies such as environmental standards, the emission charging system and emission trading system have also been adopted in the development process in order to protect the environment and promote China's sustainable development. This is determined by the reality of China at this stage. Currently, a higher rate of economic development in China is conducive to many development targets, such as poverty reduction, increasing the socio-economic sustainability, overcoming various macroeconomic risks, maintaining economic stability, creating a larger middle class and coordinating the gap between the rich and the poor, thus enhancing the payment capacity of the people and cultivating more efficient market demand, which is beneficial to reducing social conflicts and improving investment & consumption demand, and is also beneficial to the implementation of the scientific development philosophy and the strategic thinking of building a harmonized society.

China's Energy-environment Problems and Policies

There are dialectical relations of interdependence and interconnection among energy, environment and economy. On the one hand, social progress and economic growth need continuous development of the energy industry to provide important support, but the method of energy development at the cost of environmental damage is difficult to sustain. On the other hand, if environment problems are solved in isolation without searching for energy development, economic development and social progress will be difficult to continue, and environment protection will also be lacking in terms of a material basis.

After entering into the 21st century, along with rapid economic growth, energy shortage and environment pollution in China are becoming increasingly serious. As a whole, there are four aspects of the energy-environment problems in China, namely (1) air pollution, (2) water pollution, (3) the emission of CO_2 in the atmosphere that causes global warming, mainly from the burning of coal, and (4) a shortage of future energy supply that relies on exhaustible resources (Gregory C. Chow, 2007). Environmental pollution from coal combustion is damaging human health, air and water quality, agriculture and ultimately the economy.

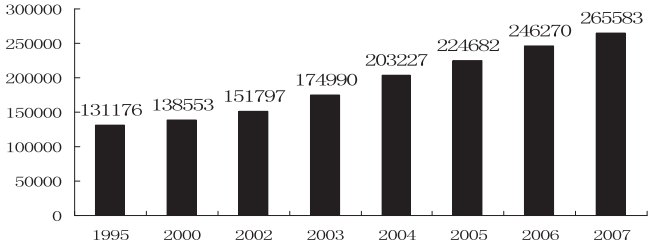
Given the double challenges of energy and environment, it is a natural choice for the Chinese government to save energy and reduce emissions (IOSC, 2007). At the same time, greater attention has been paid to global warming issues caused by the excessive emission of greenhouse gases (GHGs) from human society, and the international community has taken certain measures to cope with climate change (IPCC, 2007). As one of the countries with a higher economic growth rate, China's GHGs emission have grown continuously during recent years and will take first place in total GHGs emission in the near future (IEA, 2007). On this occasion, China is facing increasingly strong pressure for GHGs mitigation from international society. Since 2007, the Chinese government has obviously been more concerned with global climate change, and China has already taken and will continue to take a series of important steps to curb GHGs emissions of the entire country NDRC, 2007). However, as a developing country, China has no legal obligation to

GHGs mitigation in the existing international climate regime represented by the Kyoto Protocol. Therefore, the Chinese government emphasizes adaption and mitigation of climate change under the overall framework of sustainable development, which means that China will attempt to curb GHGs emissions while maintaining a steady and healthy social progress and economic development in order to achieve economic targets and environmental benefit simultaneously.

Energy Consumption and Production In China

In the past 12 years, Chinese total energy consumption has grown from 1.31 billion tons of coal equivalent in 1995 to 2.66 billion tons of coal equivalent in 2007, see Figure 2. In 2003, the rapidity of Chinese energy consumption growth passed the economic growth rate for the first time in over 20 years, and since 1980 the coefficient of energy consumption elasticity has increased from an average of less than 0.5 to more than 1, reaching 1.59 in 2004, which is the fastest year of energy consumption growth for two decades in China since the beginning of reform and opening up. A comprehensive energy shortage has appeared in China since 2002, especially electric power shortage. There were 12 provincial electric power networks in 2002, 23 provincial electric power networks in 2003, 24 to 26 provincial electric power networks in 2004, and 25 provincial power networks in 2005 that have to apply the brakes to limit electric power consumption. Because investment in the energy industry has increased recently, the capacity of China's energy supply has rapidly enhanced, and power shortage in China has eased up on the whole, but energy supply and demand is still tight, and high-uality energy, especially natural gas and petroleum are in short supply.

Figure 2 Total energy consumption of China, 1995-2007.

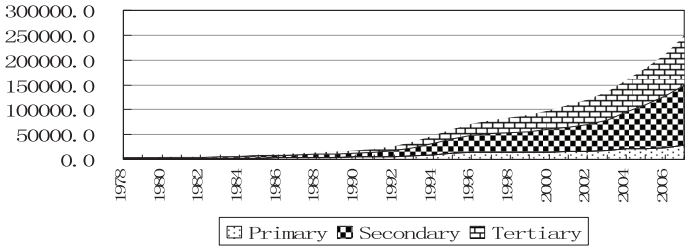


Source: China Energy Statistical Yearbook 2008

Although China has made progress in industrial restructuring in recent years (see Figure 3), the secondary industry in China remains proportionally high in GDP at present, and in 2006 the proportion of the value added of primary, secondary and tertiary industry was 11.3%, 48.6% and 40.1% (NBS, 2008). The domination of the manufacturing industry has led to increasing energy needs in China. At present, industrial energy consumption accounts for about 70% of the total energy consumption, and in some developed provinces the proportion of energy consumption is even higher than 70%. In addition, the energy consumption of transport, storage and postal services has risen significantly. From 2002 to 2005, the scale of infrastructure construction is surprising; in particular, the production capacity of energy, transportation and communication facilities has expanded rapidly. Promoting by investment in fixed assets, the scale of industrial production, in particular high energy consumption products, is rapidly enlarging. The rapid increase of imports and exports, especially in the processing trade, promotes the development of steel, nonferrous metal,

building materials, chemical and other high energy consumption industries, which then leads to dramatic increases in industrial energy consumption, which is the main reason for the rapid rise in the total energy consumption in China recently.

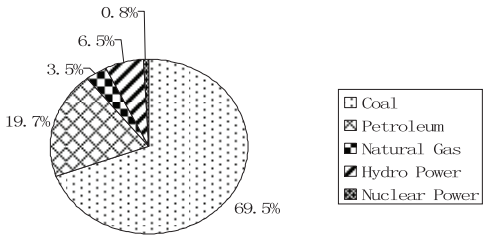
Figure 3 Industrial structure of China, 1978-2007



Source: China Statistical Yearbook 2008

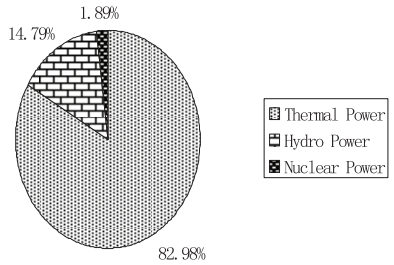
Considering the structure of energy, China is rich in coal resources, and coal dominated in the total energy consumption of China in 2007 where the proportion of coal reached 69.5% in the primary energy structure of China, see Figure 4. The energy structure of China determines the electricity structure that is also dominated by coal. In 2007, in the energy structure of electric power generation, hydropower accounted for 14.79%, thermal power whose main fuel is coal accounted for 82.98%, and nuclear power accounted for 1.89%, see Figure 5.

Figure 4 The percentage of primary energy production of China in 2007



Source: China Energy Statistical Yearbook 2008

Figure 5 China's electricity structure in 2007



Source: China Energy Statistical Yearbook 2008

Air Pollution in China

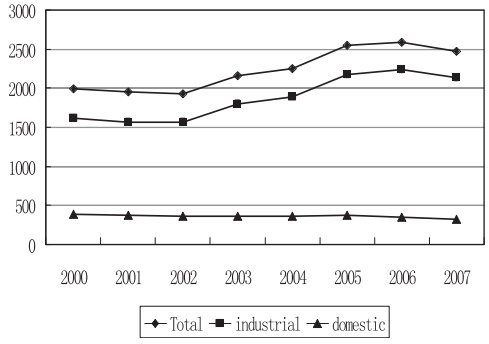
The air quality in China, especially in urban areas, is among the most polluted in the world. A report released in 1998 by the World Health Organization (WHO) noted that of the ten most polluted cities in the world, seven can be found in China. Sulfur dioxide and soot caused by coal combustion are two major air pollutants, resulting in the formation of acid rain, which now falls on about 30% of China's total land area. Industrial boilers and furnaces consume almost half of China's coal and are the largest single sources of urban air pollution. The rest of pollution is due to the burning of coal for cooking and heating in many cities.

The energy structure is dominated by coal in China, and particularly in recent years, rapid economic development has resulted in the constant increase of coal consumption. Although newly-built coal-burning power plants are equipped with desulfurization units, the pollution problems caused by coal burning, in particular air pollution problems, are still serious, which has led to

the objectives of environmental pollution treatment not being achieved effectively in the social and economic development goals established during the 10th FYP. For quite some time to come, coal will still be the primary energy of China, and the consumption of coal will continue to increase, which will cause great difficulties for air pollution treatment in China.

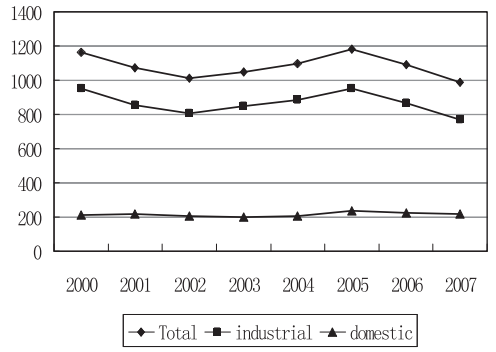
Figures 6 and 7 show the emissions of SO_2 and soot in China in recent years. In 2007, China's total SO_2 and soot emissions were 24.6 million tons and 9.8 million tons respectively, and thereinto industrial SO_2 emissions are 21.4 million tons, accounting for 86.7% of the total SO_2 emissions in the entire country. Long-term heavy SO_2 emissions lead to serious SO_2 and acid rain pollution in China.

Figure 6 SO_2 emission in China 2001～2007
(Unit: 10,000 tons)



Source: China Environmental Statistical Yearbook 2008

Figure 7 Soot emission in China 2001～2007
(Unit: 10,000 tons)



Source: China Environmental Statistical Yearbook 2008

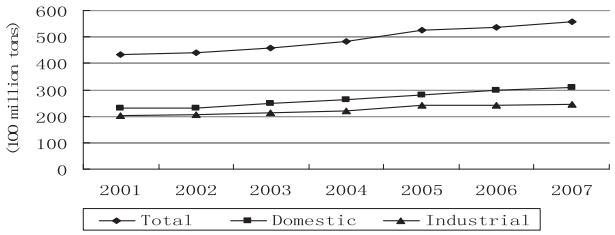
Another major source of air pollution came from the use of diesel oil and gasoline in the transportation sector. The vehicle population in China has been growing rapidly over the past decade and will likely continue to do so for the foreseeable future, which will lead to serious air pollution problems, especially in urban areas.

Water Pollution in China

At present, water pollution is still one of China's most critical environmental problems. Figure 8 shows the wastewater discharge of China in recent years. Of the water resources monitored at the national level in 2007, 50.1 per cent of major rivers and 71.5 per cent of lakes and reservoirs fell into or below the worst two of China's five water quality classes (MEP, 2008a). Under China's water quality standards, such water is classed as unfit for human contact or industrial use. Poor water quality exacerbates water scarcity, which is severe in some parts of China — water pollution is highest, and water availability lowest, in northern China, where some areas have only 4 per cent of the world's average availability of water per person. As a result, about one quarter of the population does not have access to water that will not cause health impacts. China's water pollution accidents have been increasing in recent years, especially since 2006, and the Taihu Lake, Chaohu

Lake, Dianchi Lake, having consecutive large-scale outbreaks of cyanobacteria, as well as a number of important drinking water sources are being polluted, seriously affecting people's production, life and social stability.

Figure 8 Waste water discharge in China 2001～2007



Source: China Environmental Statistical Yearbook 2008

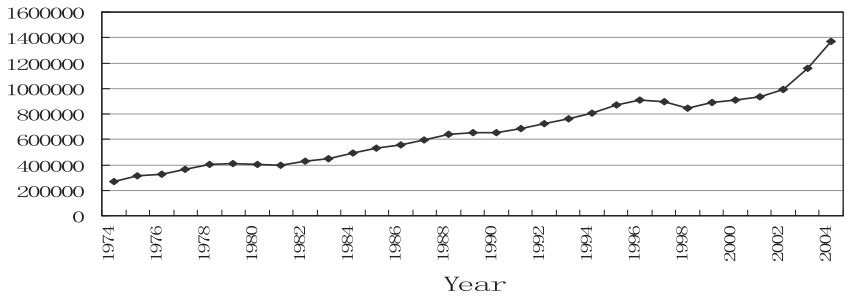
Key causes of water pollution in rural China are agricultural production methods and rural industry, particularly the Township and Village Enterprises (TVEs). In the cities of China, water quality is threatened by the discharge of untreated industrial effluent and sewage into waterways, since about half of China's cities lack sewage treatment facilities.

GHGs Emissions in China

According to the Initial National Communication on Climate Change of the People's Republic of China, the country's total greenhouse gas (GHGs) emissions in 1994 were 4,060 million tons of carbon dioxide equivalents. Its total GHG emissions in 2004 was about 6,100 carbon dioxide equivalent, of which 5,050 million tons were carbon dioxide, 720 million were carbon dioxide equivalent of methane and 330 million were carbon dioxide equivalent of nitrous oxide. From 1994 to 2004, the average annual growth rate of GHG emissions was around 4 percent, and the share of carbon dioxide in total GHGs emissions increased from 76 percent to 83 percent.

In addition to industrial energy needs, rising living standards have resulted in greater energy demands in the transport and building sectors in China. Because of the rapid growth of total energy consumption, especially the explosion of coal consumption, China’s GHGs emissions have also increased dramatically, see Figure 8. At present, the energy development of China is facing increasingly serious environmental constraints.

Figure 8 Total fossil fuel CO_2 emission in China, 1974-2004.



Source: http://cdiac.esd.ornl.gov

China's Environmental Policies

From the 1980s, the Chinese government assumed environmental protection as a basic national policy. In 1984, the National Environmental Protection Committee was established. In 1989, the first *Environmental Protection Law* was promulgated. In 1992, after the United Nations Conference on Environment and Development (UNCED), China was one of the first countries to establish and implement the sustainable development strategies. In 1993, the Environment and Resources Committee of the National People's Congress (NPC) Standing Committee was officially established. So far, the National People's Congress and the State Council have promulgated 8 laws related to environmental protection, 14 laws on natural resources management and 34 regulations on environmental protection in total, and the different levels of environmental protection departments have introduced over 90 national environmental protection standards and more than 1,020 local environmental protection regulations, so that the environmental legal system in China is becoming increasingly mature.

Because of rapid economic growth, and the economic development mode with the characteristics of high consumption and high pollution, China's environmental problems are becoming progressively more obvious. Since the 21st Century, the Chinese government has argued that it is a natural choice to implement a green strategy for sustainable economic development in China. The content of the green strategy is as follows: developing a recycling economy and improving the efficiency of resource utilization; developing cleaner production and lowering pollution cost during the process of production; developing green consumption and reducing the ecological damage during the process of consumption; developing new energy and achieving industrial ecological civilization.

China has been dedicated to controlling SO_2 emissions and reducing air pollution for many years, and the major measures include establishing SO_2 control zones and acid rain control zones, imposing discharge fees on SO_2, adopting flue gas desulphurization for burning boilers and so forth. At present, remarkable results have been achieved by these measures such that new data shows in 2007 total SO_2 emissions in China dropped 4.66% more than in 2006 (MEP, 2008b), which was the first time that total SO_2 emissions had decreased in the past few decades.

In recent years, the Chinese government has further strengthened efforts to deal with climate change, founded the National Leading Group to Address Climate Change headed by premier Wen Jiabao, and published China's National Climate Change Programme and China's Scientific & Technological Actions on Climate Change. In addition, the Chinese government enacted the Comprehensive Work Program on Energy Saving and Pollution Reduction, and took compulsory measures and policies including closing small thermal power plants to reduce domestic energy consumption.

In the 11th FYP, China has clearly set forth its main goals for environmental protection for the next five years: by 2010, while the national economy will maintain a relatively stable and fast growth, the environmental quality of key regions and cities will be improved, and the trend toward ecological deterioration will be brought under control. The 11th FYP also requires energy con-

sumption per unit of GDP to decline by 20 percent, compared with the end of the 10th Five-Year Plan period. The total amount of major pollutants discharged will be reduced by ten percent, and forest coverage will be raised from 18.2 percent to 20 percent.

In general, the environmental policies adopted in China at present are dominated by command-and-control measures. Although market-based measures have aroused extensive concern in society, there is still a lack of practical application. However, it can be predicted that there will be more environmental economic policies and measures to be adopted along with the economic development and constant improvement of the market economy system in China.

Some Issues Related To Post-Kyoto Arrangements

Integrative climate change policies and development policies

Climate change policies are more effective if they are integrated. At present, many countries especially developing countries' awareness of climate issues is increasing, but the economic costs of climate protection measures, juxtaposed with the significant scientific uncertainties about the extent and impacts of climate change have generally favored a "wait-and-see" attitude on the part of policy makers, which directly leads to the reality that only slow progress has been made in global climate policy negotiations. The situation is also compounded in developing countries by the rightful preoccupation with meeting basic domestic requirements. So determining the best way to link climate change policy with developmental policy is a very important issue that should be considered carefully in China.

Firstly, one method that combines the development policies with the climate change policies in China is to identify areas of overlap. For example, policies that attempt to improve energy efficiency can also reduce CO_2 emissions and lead to better urban air quality, so the additive utilities on climate issues are the area where most overlap occurs. Meanwhile, forestation will not only increase carbon sinks, but also protect the ecology, and these additive utilities on sustainable development issues are also overlapping areas. Therefore, combining the development policies with the climate change policies on the basis of these overlapping areas will be the best method.

Secondly, a series of indicators that can measure the achievements being made in these overlapping areas should be set up, and these indicators should be absorbed into the national strategies and the local development plans so that the climate change policies and the development policies can be integrated into national economic strategies.

Finally, relevant policies should be developed and enacted based on the above works and should be suitable for the national economic strategies as well as those indicators. In this way, the policies will take effect in the overlapping areas because the two objectives of climate protection and economic development are all taken into account.

This is because only in overlapping areas would the stakeholders have the incentives to develop and implement these policies. *The Mid-to-Long Term Special Plan for Energy Conservation* (NDRC, 2004) enacted by the Chinese government is a good example of balancing the interests between economic development and climate protection, which will not only improve energy effi-

ciency, but also reduce CO_2 emissions. In addition, this plan will also contribute to the industrial structure adjustment, energy security enhancement as well as local environmental quality improvement. Therefore, this plan is a policy that will be of benefit to local governments, enterprises and the public at the same time, so these stakeholders will also promote the implementation of this policy actively.

In addition to establishing links between different policies, the different levels (local level, national level and international level) of the policy (including poverty or climate change policies) should be linked, and the following should be performed in order to achieve this target: Firstly, between the international level and the national level, it is still important to shape decisions, conventions, and agreements on the basis of bilateral or multilateral relationships. Secondly, between the national level and the local level, it will be more effective to enact national strategy or national programs. States can influence the local strategy via the demonstration effect of the national strategies. Furthermore, the State can adopt and pursue some pilot projects or demonstration projects, as well as local capacity-building (including training, information sharing). It can on the one hand provide incentives for local stakeholders and on the other hand diffuse information about poverty reduction and climate change, which will influence local decision-making eventually. As above, this process must be of benefit to all stakeholders and more attention should be paid to the overlapping areas. Additionally, the international level could also be linked to the local level directly via the national level, such as direct technological or financial assistance to local areas. At present, China is introducing the climate change policy to local areas and local strategies for addressing climate change in some provinces have been enacted. In fact, some relevant policies such as poverty reduction and disaster mitigation have already been implemented successfully at the local level. China thinks that local economic realities should be considered firstly when shaping national climate policy, i.e. consider how to integrate local economic policy and national climate change policy.

Of course, it is not sufficient to simply have good policies because they should be implemented successfully, especially at the local level or at the project level. In order to achieve this target, first of all, these policies should be given judicial significance so that the relevant stakeholders will be bound under the legal restrictions and ensure the implementation of these policies; Secondly, local capacity building should be strengthened via training or other means in order to increase public and local awareness of the climate change problems, thus increasing the possibility of self-conscious implementation; Thirdly, having adequate technical and financial support in the initial stage of policies implementation should be ensured, which is also a field in which China needs the support of the international community.

Good policies must also be policies that are adjusted and changing all the time to adapt to the changing needs of the people and the real policy circumstances. Therefore, it is very important in the national policy-making process to obtain effective information feedback smoothly from the local and the national community. In this regard, the stakeholders' participation should be strengthened during the policy-making process through holding public hearings, people's congresses at all levels and so forth.

For the developing countries: goal-oriented or process-oriented

Climate change is one of the most serious challenges to humanity in the 21st century and a matter of human survival and the development of all countries, which requires cooperation and joint efforts by the international community. Annex-I countries should take the lead to shoulder more responsibility according to Article 3.9 of the UNFCCC. Specifically, aiming at stabilizing the GHGs concentration in the atmosphere, there are two types of schemes in "beyond 2012" in China at present, which can be summarized as goal-oriented and process-oriented, differing in the ways to achieve it. The goal-oriented scheme emphasizes the use of indicators to influence the distribution of emission reductions among countries. Whereas the process-oriented scheme emphasizes the concrete needs in the process of the UNFCCC implementation and pays more attention to certain special topics such as technology cooperation and development. Comparing the two schemes, the goal-oriented scheme has a clear goal of total amount control but no concrete measures to achieve it, accompanied by uncertainty and very low political feasibility; while the process-oriented scheme has a direct impact on the process and more political acceptability but risks still exist because of no specific goal.

Past experience in the first commitment period have proven that the goal-oriented scheme is implemented unsatisfactorily, and the reasons for this situation may include involvement in some unsolvable political issues and the difficulty in assuring the equity of quota distribution. Comparatively, the process-oriented scheme emphasizes the importance of technology transfer, and has been proposed by other Chinese officials and scholars at many important international occasions. Thus, this scheme can be considered as being unanimously approved in Chinese political and academic circles. It is even more crucial that the process-oriented scheme can bypass the deadlock of quota, so it is a feasible alternative scheme at present since many countries have no strong political will to reduce the GHGs emissions via the measure of quota allocation. Therefore, China would rather adopt the process-oriented scheme than adopt the goal-oriented scheme.

Technology transfer under the UNFCCC framework

At present, China is experiencing rapid economic growth with gradually rising purchasing power for advanced technologies, but the high prices of these advanced technologies and the political restrictions in developed countries result in the very low possibility of technology transfer from developed countries to China. At the same time, China is still in the mid-stage of industrialization with the character of high energy consumption, and China's urbanization process will also last for many years with massive construction demands for infrastructure. In this situation, if advanced climate sound technology cannot be applied in time, the technological "lock-in" effect will lead to the result that current higher GHGs emissions will last for several decades in China. Therefore, China's sustainable development strategy is encountering a technical bottleneck.

The following divides the emissions into three factors: GHGs emissions per GDP, GDP per capita and population. For developing countries, as a whole the population will still increase for a long time in the years to come, and developing countries will make efforts to promote the economic development and increase the GDP per capita. So the GHGs emissions per GDP is the only

factor that can be decreased in order to decrease the emissions of GHGs. In order to achieve this target, developing countries should improve the economic structure and increase the economic efficiency, and technology progress will play a key role in this course. Therefore, technology transfer from developed countries is very important for the reduction of GHGs emissions in developing countries.

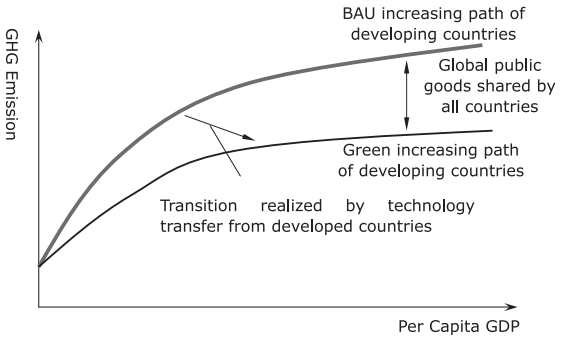
$$\text{GHG}_s \text{ emission} = \frac{\text{GHG}_s \text{ emission}}{GDP} \times \frac{GDP}{\text{population}} \times population$$

Technology transfer under the UNFCCC framework can be based on the theory of externality because of the "public goods" feature of the global atmosphere. In general, when there are goods, services, and resources that people can obtain without paying for them at a market equilibrium price, inefficiency will be the result. The term for this in economics is "externality." Global climate change is a typical issue of environmental externality, and there will be a "market failure" if international society wants to realize sufficient climate sound technology transfer from developed countries to developing countries merely by use of the market mechanism.

Generally speaking, the government should and can be responsible for the supply of public goods. However, the atmosphere as global public goods has its own peculiarity because there is no "global government" to protect the global atmosphere, let alone solve the problem using public policies that are based on the state sovereignty. In this situation, international environmental agreements as a type of effective mechanism can play an important role in solving this kind of international externality. It will have two aspects of effects whereby developed countries transfer the climate sound technology to developing countries under the UNFCCC framework. On the one hand, developed countries will offset the global climate externality cost brought by them in their industrialization process; on the other hand, developing countries will avoid inflicting new stresses on the global climate system in the process of their economic development. Therefore，both developed countries and developing countries can enjoy the global climate welfare, and in essence this is a process whereby international society protects and creates the global public goods together, See Figure 1.

The purpose of technology transfer under the UNFCCC framework is to protect the atmosphere system of the Earth and achieve all mankind's sustainable development. Technology transfer under the UNFCCC framework is a win-win solution for the global climate change protection between developing countries and developed countries. On the one hand, developing countries can change the traditional economic growth mode, increase the energy efficiency and improve the energy

Figure 1 Technology transfer under the UNFCCC framework: a win-win solution



Source: Zou Ji, et al. 2008

structure with the support of imported environmentally sound technologies from developed countries, thus reducing the air pollution in developing countries and achieving the target of protecting the climate and environment; on the other hand, developed countries may enjoy a much cleaner global atmosphere system due to the environmentally sound technology transfer to developing countries. In addition, technology transfer under the UNFCCC framework is also very important for avoiding the technological "lock-in" effect in developing countries.

Principle and Objective Of The Copenhagen Climate Change Conference[1]

I. Principles

1. The UNFCCC and its Kyoto Protocol as the Basis and the Mandate of the Bali Roadmap as the Focus. The UNFCCC and its Kyoto Protocol constitute the basic framework and legal basis for international cooperation to address climate change, which embody the consensus of the international community and serve as the foundation governing the implementation of the Bali Roadmap. The Bali Roadmap affirms the mandate to enhance the implementation of the UNFCCC and its Kyoto Protocol, which is, on the one track, to secure the full, effective and sustained implementation of the UNFCCC by making corresponding arrangements in terms of mitigation, adaptation, technology transfer and financial support and, on the other track, to determine further quantified emission reduction targets for developed countries for the second commitment period under the Kyoto Protocol.

2. The Principle of Common but Differentiated Responsibilities. Developed countries shall take responsibility for their historical cumulative emissions and current high per capita emissions to change their unsustainable way of life and to substantially reduce their emissions and, at the same time, to provide financial support and transfer technology to developing countries. Developing countries will, in pursuing economic development and poverty eradication, take proactive measures to adapt to and mitigate climate change.

3. The Principle of Sustainable Development. Sustainable development is both the means and the end of effectively addressing climate change. Within the overall framework of sustainable development, economic development, poverty eradication and climate protection should be considered in a holistic and integrated manner so as to reach a win-win solution and to ensure developing countries secure their right to development.

4. Mitigation, Adaptation, Technology Transfer and Financial Support on the Same Footing and as Equal Priorities. Mitigation and adaptation are integral components of combating climate change and should be given equal treatment. Compared with mitigation that is an arduous task over a longer time horizon, the need for adaptation is more real and urgent in developing countries. Financing and technology are indispensable means to achieve mitigation and adaptation. The fulfillment of commitments by developed countries to provide financing, technology transfer and

[1] This part is extracted from the official document released by the Chinese government on May 20, 2009. The title of the document is "Implementation on the Bali Roadmap-China's Position on the Copenhagen Climate Change Conference" and the full text is available at the website: http://en.ndrc.gov.cn/newsrelease/t20090521_280382.htm.

capacity building support to developing countries is a condition *sine qua non* for developing countries to effectively mitigate and adapt to climate change.

II. Objective

The objective of the Copenhagen Climate Conference is to further enhance the full, effective and sustained implementation of the UNFCCC and its Kyoto Protocol and to reach a positive outcome, focusing on making concrete arrangements for mitigation, adaptation, technology transfer and financial support:

1. To set deeper quantified emission reduction targets for developed countries for the second commitment period under the Kyoto Protocol, and to ensure comparability of quantified emission reduction commitments by developed countries that are Parties to the Kyoto Protocol and those that are not;

2. To establish effective institutional arrangements to ensure that developed countries are fulfilling their commitments to provide technology, financing and capacity building support to developing countries;

3. To enable developing countries to take nationally appropriate mitigation and adaptation actions, in the context of sustainable development, supported by technology, financing and capacity building from developed countries.

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