



**UNDP Project Document**  
**The Government of the People's Republic of China**  
**and**  
**United Nations Development Programme**  
**PIMS 2962: Enabling China to Prepare Its Second National**  
**Communication to the UNFCCC**

**Brief Description**

This project will enable China to fulfill the commitments under the United Nations Framework Convention on Climate Change (UNFCCC) by enabling it to prepare its Second National Communication (SNC) in accordance with the Guidelines for the Preparation of National Communications from non-Annex I Parties (17/CP.8) adopted by the Conference of Parties (COP) to the UNFCCC. The project will strengthen the National Communication process and its linkage with national development priorities. Based on the experience and lessons learned from the Initial National Communication (INC), the project will broaden and consolidate the network of stakeholders, including those in the government, social groups, research and education institutions, industries, individuals, and NGOs, enhance technical capacity of national experts, and strengthen the institutional framework for the preparation of national communications. Furthermore, compared to the INC, the project will place greater emphasis on relevant policies on mitigation and adaptation to climate change and the results of their implementation, so as to enable China to effectively address climate change in the process of pursuing national and sectoral sustainable development.

The project will develop a more comprehensive national Greenhouse Gas (GHG) inventory, with a report of extended categories and sources of GHG emissions and applying the IPCC Good Practice Guidance and Uncertainty Management to reduce uncertainties in the inventory. It will establish a preliminary national GHG inventory database management system, with a view to administering inventory data in a more scientific way and making the preparation of GHG inventories a continuing process. The project will develop an approach for projecting GHG emissions in China. It will further strengthen the assessment of the impacts of and vulnerability to climate change and dissemination of China's relevant policies and measures to address climate change. It will further enhance the public awareness on climate change. The project will lead to the submission of the SNC to the Conference of the Parties (COP) to the UNFCCC.

# Contents

ACRONYMS.....	2
SECTION I: ELABORATION OF THE NARRATIVE .....	4
<i>PART I: SITUATION ANALYSIS</i> .....	4
<i>PART II: STRATEGY</i> .....	12
<i>PART III: MANAGEMENT ARRANGEMENTS</i> .....	67
SECTION II: STRATEGIC RESULT FRAMEWORK.....	78
<i>PART I: INCREMENTAL COST ANALYSIS</i> .....	78
<i>PART II: LOGICAL FRAMEWORK ANALYSIS (PROJECT PLANNING MATRIX)</i> .....	78
SECTION III: TOTAL BUDGET AND WORK PLAN .....	99
SECTION IV: ADDITIONAL INFORMATION .....	107
<i>PART I: OTHER AGREEMENTS (SEE ATTACHED)</i> .....	107
<i>PART II: STAKEHOLDER INVOLVEMENT PLAN</i> .....	108
<i>PART III: SUMMARY REPORT OF SELF-ASSESSMENT EXERCISE</i> .....	109
<i>PART IV: PROJECT RISKS AND ASSUMPTIONS</i> .....	119
<i>PART V: PROJECT MONITORING AND EVALUATION PLAN</i> .....	120
APPENDIX: TERMS OF REFERENCES .....	121

## Acronyms

APR	Annual Project Report
AR4	The Fourth Assessment Report
BEF	Biomass expansion factor
BOD	Biological Oxygen Demand
CAS	Chinese Academy of Sciences
CCIR	Center for Climate Impact Research
CICETE	China International Center for Economic and Technological Exchange
CH <sub>4</sub>	Methane
CMA	China Meteorological Administration
CNCCP	China's National Climate Change Programme
CO <sub>2</sub>	Carbon dioxide
COD	Chemical Oxygen Demand
COP	Conference of Parties
DOC	Degradable organic composition
ERI	Energy Research Institute
FEEI	Forest Ecology & Environment Institute (of Chinese Academy of Forestry)
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
GWP	Global warming potentials
HFCs	Hydrofluorocarbons
IAP	Institute of Atmospheric Physics (of Chinese Academy of Sciences)
ICE	Information, Communication and Education
INC	Initial National Communication
IPCC	Intergovernmental Panel on Climate Change
LHV	Low Heating Value
LUCF	Land use change and forestry
MCF	Methane correction factor
MDGs	Millennium Development Goals
MERP	Methane emission of rice paddy field
MOST	Ministry of Science and Technology
MSW	Municipal solid waste
N <sub>2</sub> O	Nitrogen monoxide
NDRC	National Development and Reform Commission
NGO	Non-governmental Organization
NLGCC	National Leading Group on Climate Change
NPD	National Project Director
OECD	Organization for Economic Cooperation and Development

ODS	Ozone Depleting Substances
NPC	National Project Coordinator
PDF	Project Development Fund of GEF
PFCs	Perfluorocarbons
PIR	Project Implementation Report
PMO	Project Management Office
ppm	Part per million
PSC	Project Steering Committee
PWLW	Paddies Water-Logged in Winter
R&D	Research and Demonstration
SAR	Special Administrative Regions
SEPA	State Environmental Protection Administration
SF <sub>6</sub>	Sulfur hexafluoride
SNC	Second National Communication
SOC	Soil organic carbon
TOR	Terms of Reference
TPR	Tripartite review
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change

## **SECTION I: ELABORATION OF THE NARRATIVE**

### **PART I: SITUATION ANALYSIS**

#### **1.1. CONTEXT AND GLOBAL SIGNIFICANCE**

Climate change is a global concern of the international community. The Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) shows that addressing climate change has become a common challenge for the international community which is closely related to the realization of the Millennium Development Goals (MDGs) of the United Nations.

In order to effectively address climate change, the United Nations Framework Convention on Climate Change (UNFCCC) requires that Parties protect the climate system for the benefit of present and future generations, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. The UNFCCC also requires all Parties to provide national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases; formulate, implement and publish national programmes containing measures to mitigate and adapt to climate change; promote the development and application of technologies that reduce or prevent anthropogenic emissions of greenhouse gases; promote the enhancement of sinks of greenhouse gases; develop adaptation plan for climate change; promote the exchange of information about climate change and response measures; promote education, training and public awareness related to climate change. According to the UNFCCC, each Party has the obligation to communicate information, including a national inventory of emissions by sources and removals by sinks of all greenhouse gases, a general description of steps taken and envisaged to implement the UNFCCC as well as other information that the Party considers appropriate. The Chinese Government attaches great importance to its international obligations. Officials and experts of relevant government departments, social groups, research institutes, universities and enterprises are engaged in the development of the Initial National Communication in accordance with the UNFCCC *Guidelines for the preparation of national communications from non-Annex I Parties*. After nearly 3-year concerted efforts of more than 400 experts from about 100 organizations, the Initial National Communication of the People's Republic of China on Climate Change (hereinafter referred to as INC) was completed. The INC, which was widely commented, discussed and adopted by the National Coordination Committee on Climate Change, approved by the State Council, was submitted to the Secretariat of the UNFCCC in October 2004. The publication of the INC has laid a good foundation for the international community to have a comprehensive understanding of the efforts of China in combating climate change.

As a non-Annex I Party to the UNFCCC, China, in accordance with its national circumstances and the requirements of sustainable development, has fulfilled its obligations to formulate, implement, publish and update its National Climate Change Program as provided by the UNFCCC. The National Development and Reform Commission (NDRC), in cooperation with 17 departments, has mobilized

dozens of experts from various fields to formulate *China's National Climate Change Program* (CNCCP). After two-year's hard work, the CNCCP was completed and officially published for implementation upon approval by the State Council on May 30, 2007. The CNCCP identifies the specific objectives, principles, priority areas, policies and measures of China in combating climate change. The CNCCP is China's first policy document on climate change and the first national program on climate change among all developing countries. The publication and implementation of the CNCCP demonstrates that China has given a high priority to this area and that is fully committed to contribute to the international efforts to address climate change, in consonance with national development priorities. The SNC will complement and strengthen the efforts and momentum generated by CNCCP, focusing on priority areas and enhancing stakeholders' participation. The SNC will also provide the international community with understanding of China's efforts to strategy link climate change with national development, enhance international cooperation and exchanges, and make new contribution to global efforts to combat climate change.

The Chinese Government attaches great importance to the issue of climate change. In 1990, the Chinese Government set up the National Coordination Committee on Climate Change, with Mr. Song Jian, then State Councilor, as the Chairman of the Committee. In 1998, it was restructured, with Mr. Zeng Peiyan, the Chairman of NDRC and now Vice Premier, being the Chairman of the Committee. In 2003, Mr. Ma Kai, Chairman of NDRC, succeeded the Chairmanship. In June of 2007, the State Council set up the National Leading Group on Climate Change (NLGCC) headed by Premier Wen Jiabao, with Vice Premier Zeng Peiyan and State Councilor Tang Jiaxuan as the Vice Chairmen, and Mr. Ma Kai, Director of Office of National Leading Group on Energy (NLGE) also heading the Office of NLGCC. Meanwhile, as a developing country at a low development stage, with a huge population, a coal-dominant energy mix and relatively low capacity to tackle climate change, China will surely face more severe challenges when coping with climate change along with the acceleration of urbanization, industrialization and the increase of residential energy consumption.

## **1.2. THREATS, ROOT CAUSES AND BARRIERS ANALYSIS**

Climate is an important component of natural environment upon which mankind depends. Climate change means dramatic change of average conditions of global climate or a comparatively long-lasting change in climate. Climate change may be caused by internal or external natural forcing, or resulted from continuously human-induced change of land use and the composition of the atmosphere. Article 1 of the UNFCCC defines "climate change" as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods", i.e. the climate change due to anthropogenic emissions of greenhouse gases. AR4 of the IPCC shows that global climate is mainly characterized as significant change of a warming trend.

*"Adverse effects of climate change" means changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or*

*productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare. Article 3 of the UNFCCC also clearly provides that “the specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties should be given full consideration”.* The AR4 of the IPCC shows that climate change resulting from anthropogenic activities is affecting the globe and this trend will accelerate in the next 100 years.

The main cause of global climate change is the CO<sub>2</sub> emissions of developed countries since their industrialization, which leads to continuous rise of GHG concentrations in the atmosphere and produces significant impacts on global climate. The UNFCCC clearly provides in the preamble that the Parties to the Convention notes “that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs”. Little progress has been made in reducing GHG emissions mainly due to the lack of effective responses from some developed countries to commit reduction target and the lack of urgency to take substantial domestic mitigation actions. GHG emissions have continued to grow worldwide creating an urgency to tackle emissions in a globally concerted effort. This includes the need to improve GHG emission inventories at the national level to provide policy makers with more reliable information in key emission sources and emission trends.

In this context, the SNC project will strengthen China’s capacity to establish a national system, methodological framework, and institutional strengthening to meet the requirements for developing national GHG inventory, including field measurement data to determine appropriate emission factors, quality control of the inventory, tools to project future GHG emissions, and the development of national database on GHG emissions. It will also carry out assessments on the impacts of climate change and identify adaptation options in the short and long terms.

### **1.3. INSTITUTIONAL, SECTORAL AND POLICY CONTEXT**

The main tasks of the NLGCC are as follows: to study and develop vital national strategies, guidelines and policies on climate change; to make overall arrangements on climate change activities; to study and review international cooperation and negotiation strategy; and to coordinate and tackle major issues in combating climate change. The members of the NLGCC include NDRC, Ministry of Foreign Affairs, Ministry of Science and Technology, China Meteorological Administration, State Environmental Protection Administration, Ministry of Finance, Ministry of Commerce, Ministry of Agriculture, Ministry of Construction, Ministry of Communications, Ministry of Water Resources, State Forestry Administration, Chinese Academy of Sciences, State Oceanic Administration, General Administration of Civil Aviation of China, State Statistics Bureau, Ministry of Land and Resources and Ministry of Health. Due to the strong policy nature of the SNC project and the need for

leadership of the NLGCC, no decision on major issues will be taken before they are fully deliberated by the NLGCC. The SNC will be subject to the deliberation and adoption of the NLGCC, and to the approval by the State Council before submission to the Secretariat of the UNFCCC.

With such functions as organizing and implementing national economic and social development strategy, developing mid- Term, long- Term and annual plans as well as proposing goals and policies on national economic development and optimization of key economic structures, NDRC is an important macro regulatory department on economic and social development, which also hosts the Office of NLGCC. NDRC will organize the implementation of the project through the Office of NLGCC on behalf of the Chinese Government. These efforts and new initiatives to tackle GHG emissions that would take during the implementation of this project will be compiled under China's SNC.

To strengthen the overall guidance in implementing the project, NDRC will establish a Project Steering Committee with representatives serving as members from the Office of NLGCC, the Department of Treaty and Law of the Ministry of Foreign Affairs, International Cooperation Department of the Ministry of Finance, Department of Social Development of the Ministry of Science and Technology, Department of International Cooperation of SEPA, Department of Science and Technology of China Meteorological Administration and China Resident Office of UNDP. The Office of NLGCC will set up a China SNC project management office, which will supervise and manage the project implementation.

As a responsible developing country, China has adopted a series of policies and measures in the course of promoting sustainable development. These policies and measures include: and among others, energy saving, development of renewable energy, afforestation and reforestation, which are conducive to GHG control and enhancement of the capacity to adapt to climate change. In doing so, China has made positive contribution to the mitigation of and adaptation to global climate change. It is estimated that in the past 15 years (1990-2005), through economic restructuring and improving energy efficiency, China had saved a total of about 800 million tons of coal equivalent, equal to a reduction of 1.8 billion tons of CO<sub>2</sub> emissions. These efforts and new initiatives to tackle GHG emissions that would take during the implementation of this project will be compiled under China's SNC.

Recently, the Chinese Government has put forward the strategic thinking of scientific development and building a harmonious society, which has accelerated the development of a resource conservation and environmentally friendly society and further enhanced a series of policies and measures to combat climate change. In 2004, the State Council adopted the *Draft Outline on Medium and Long-Term Development Plan on Energy (2004-2020)*. In the same year, NDRC issued the first *Medium and Long- Term Special Plan for Energy Saving*. In February 2005, the Standing Committee of the National People's Congress adopted the *Law of the People's Republic of China on Renewable Energy*. In December 2005, the State Council adopted the *Decision on the Implementation of the Scientific*



*Development Approach and Strengthening Environmental Protection*. In August 2006, the State Council adopted the *Decision on Strengthening Energy Conservation*. These regulatory and policy decisions provide policy and legal guarantee for China to further enhance its capacity in combating climate change.

*The Outline of the 11<sup>th</sup> Five-Year Plan of China on National Economic and Social Development* states that China will endeavor to make progress in controlling GHG emissions and enhance its capacity in sustainable development. This is a key decision of strategic importance made by the Chinese Government in the present circumstance, which shows a sense of responsibility for addressing climate change. It fully reflects both the current and long- Term requirements and the determination of China to build a resource conservation and environmentally friendly society, which give strong and clear policy guidance. In addition, the *Outline of Medium and Long- Term National Development Plan for Science and Technology* puts the development of technologies of energy resources and environmental protection as two top priorities in the five major national strategic areas. With regard to the monitoring of and response to global environmental change , the Outline stresses the importance of technology research on GHG control, treatment and utilization in key industries as well as research in response measures to mitigate climate change.

*China's National Climate Change Programme* puts forward the guidelines of China in addressing climate change, i.e., to give full effect to the Scientific Approach of Development; to speed up the construction of socialist harmonious society; to advance the fundamental national policy of resources conservation and environmental protection; to control GHG emission and enhance sustainable development capacity; to secure economic development; to conserve energy, to optimize energy structure, and to strengthen ecological preservation and construction; to rely on the advancement of science and technology; to enhance the capacity to address climate change and make contributions to the mitigation of global climate change. The strategic goal of China to address climate change is to make significant achievements in controlling greenhouse gas emissions, to enhance the capability of continuous adaptation to climate change, to promote climate change related science, technology and research and development (R&D) to a new level, to markedly raise public awareness on climate change, and to further strengthen the institutions and mechanisms on climate change. *China's National Climate Change Programme* is an important action plan to guide China in addressing climate change during the 11th Five-Year Plan period.

#### **1.4. STAKEHOLDER ANALYSIS**

Chinese government plays a very important and active role in climate change and China's related decision-making processes. Research institutions and universities, especially the ones that had participated in the INC to facilitate its implementation, concern the technical aspects of climate change. Non-governmental organizations (NGOs) could facilitate China in outreach activities, and provide a linkage between the communities, public at large and the Government in addressing the environmental issues. The involvement of these stakeholders will reflect the diversity of

circumstances and issues encountered throughout the country.

Stakeholder involvement is a key element of sustainable inventory process. The strengthening of relations with national institutions will create a more proactive network and new relations within the government, and with other stakeholders, particularly for “win-win” joint activities such as utilizing inventory data for other national activities. As the capacity building project for developing China’s SNC, the aim and starting point of this project are to extensively seek cooperation and collaboration of many stakeholders, to develop a national inventory on GHG emissions with sound data, consistent format and comparable result based on scientific method, and to submit a national communication which reflects China’s national circumstance related to climate change. The communication shall include information on national circumstances, a national greenhouse gas inventory, impacts of and adaptation to climate change, policies and measures related to the mitigation of climate change, research and systematic observation, education, training and public awareness, needs in funding, technology and capacity building, etc. The implementation of this project is a process in which all members of NLGCC will have a role to play, and local governments, social groups, research institutes, universities and non-governmental organizations (NGOs) shall be involved. The NDRC is in charge of the management of the project on behalf of the Chinese Government.

The report on China’s SNC to be completed under this project shall serve as a foundation for China’s final SNC under the UNFCCC, and also an important step to mitigate climate change. The project will facilitate the enhancement of capacity in analysis and decision making of China’s relevant institutions and experts through their participation. As the final output of the project is the report on China’s SNC, it is conducive to enriching information and strengthening decision making capabilities of the NLGCC and its Office. As for the research institutions and experts, their capacity in overall design and development of national communications will be improved. In addition, awareness in climate change of all participants in the project will be greatly enhanced.

## **1.5. BASELINE ANALYSIS**

The effective implementation of the Project on Enabling China to Prepare Its Initial National Communication (INC) and the efforts of the Chinese Government have, to some extent, improved China’s capacity in some areas including the development of national GHG inventory, which has laid a good foundation for the development of the SNC. Although China has been developing capacities to deal with Climate Change through its INC to the UNFCCC, there is still insufficient information for decision making, lack of awareness of the issues and inadequate capabilities on climate change adaptation and mitigation. In the light of current new situation and new requirements for the development of China’s SNC, the capacity, though much improved in the previous project, is not yet strong enough to meet the needs in developing China’s SNC..

The external evaluation of the project on *Enabling China to Prepare its INC* put forward the following recommendations on SNC work. With regard to capacity building, it is recommended to

put capacity building in the establishment of institutions and routine procedures conducive to the development of the inventory as the priority areas so as to better support the development of national GHG inventory in SNC. The Office of NLGCC will maintain and improve various databases and enhance the quality control. The proposed SNC project will further improve existing national statistic system and indicator system to facilitate the development of national GHG inventory.

With regards to the improvement of inventory method and data quality, it has been recommended to establish systems for collecting, processing and on site testing of regular energy activities data. Based on existing data on five key industrial products (including carbon dioxide emissions from the production processes of cement, lime, iron and steel and calcium carbide and nitrous oxide emissions from adipic acid production), it is needed to appropriately expand the industrial GHG emissions database in accordance with the requirements of SNC. For agricultural activities, China intends to apply the CH4MOD<sup>1</sup> and IAP-N models, expand site measurement of some emission factors and make further improvement of the data. For land use change and forestry, it will be necessary to continuously utilize remote sensing data to monitor forest area and land use change and further expand the studies on the change of soil carbon levels of different land use. For urban waste, improvements will be made in the sample analysis on urban solid waste and improve the database of wastewater activities to estimate emissions from the waste sector.

The Government of China is paying great attention to support scientific studies and researches on climate change, and constantly enhances them. It has implemented a number of key research projects, such as Study on Forecasting, Impact and Countermeasures of Global Climate Change, Study on Global Climate Change and Environmental Policies, Study on Formation and Prediction Theory of Key Climate and Weather Disasters in China, and Study on Carbon Cycle in China's Terrestrial Ecosystems and Its Driving Mechanism etc... Other key projects related to climate change were also conducted, including China's Climate, Sea Level Change and Their Trend and Impact. In end of 2006 China's National Assessment Report on Climate Change has been completed, to summarize existing basic studies and researches address climate change impacts.

On the other hand, due to the complexity of circumstance of a country like China, due to limitations on knowledge and analysis methods, and due to the significant varieties across different regions with China as a big country, there exist large uncertainties in the present assessment of climate change impacts. Studies indicate that climate change has caused some impacts on China, such as sea level rise in the coastal areas, glacial retreat in northwest area, and the earlier arrival of spring phenophase.

---

<sup>1</sup> Huang, Y., W. Zhang, X. Zheng, J. Li, and Y. Yu (2004), Modeling methane emission from rice. Several models have been developed over the past decade to estimate CH<sub>4</sub> emission from rice paddies. However, few models have been validated against field measurements with various parameters of soil, climate and agricultural practice. Thus reliability of the model's performance remains questionable particularly when extrapolating the model from site micro-scale to regional scale. Modification to the original model had done focusing on the effect of water regime on CH<sub>4</sub> production/emission and the CH<sub>4</sub> transport via bubbles. The modified model, named as CH4MOD, has been validated against a total of 94 field observations.

It will also bring about significant impacts on China's natural ecosystems and social economic system in the future.

As pointed out in China's National Climate change Programme, Meanwhile, China will take practical measures to enhance its capacity to adapt to climate change via key projects for ecosystem protection, disaster prevention and reduction and other key infrastructure construction.

With regard to vulnerability and adaptation, it is recommended to carry out target studies in order to design China's climate observation system, to develop climate change scenarios used for comprehensive assessment, to support the development of comprehensive assessment model and analysis of regional vulnerability of the society, economy, environment and health of the region, to enhance research on extreme climate events and to support the integration of adaptation strategy into national, regional and local goals of sustainable development.

The Government of China always attaches importance to education, training and public awareness on climate change. The Program of Action for Sustainable Development in China in the Early 21st Century states that China will vigorously develop all forms of education at all levels, to enhance the public awareness on sustainable development and enhance their scientific and cultural capacity for their participation in the sustainable development by reinforcing personnel training. In recent years, China has intensified its efforts to promote education, training and public awareness on climate change by organizing various kinds of lectures on climate change basic knowledge, conducting climate change training courses for policy makers at central and provincial levels, and organizing conferences such as Climate Change and Ecological Environment, as well as setting up an official bilingual website on climate change (China Climate Change Info-Net <http://www.ccchina.gov.cn>) in Chinese and English to provide comprehensive information on climate change.

Even though commendable results have been achieved in recent years, there are still intensive needs to continually raising the awareness of climate change adaptation and mitigation in public and various sectors, in order to meet the target set by National Climate Change programme.

The gaps described above are considered key areas for improvement in the SNC. Addressing these gaps will provide more comprehensive and reliable analysis of GHG emissions and vulnerability and adaptation assessments, which will in turn provide relevant information for policy decisions. This will also facilitate the linkage of the SNC outcomes with national development priorities.

## **PART II: STRATEGY**

### **2.1. PROJECT RATIONALE AND POLICY CONFORMITY**

As a non-Annex I Party to the UNFCCC, China officially submitted its INC to COP 10 of the UNFCCC in December 2004. The main contents of the INC include national circumstances, national GHG inventory, impacts of climate change and adaptation, policies and measures related to climate change mitigation, research and systematic observation, education, training and public awareness, and needs for funds, technologies and capacity building. It can be said that the Project on Enabling China to Prepare Its Initial National Communication funded by GEF has not only laid the foundation for the above work, but also accumulated precious and useful experience that can be used in the preparation of China's subsequent national communications. Nevertheless, China is still facing a major challenge in the development of the SNC.

The INC recognized the need for further capacity building efforts and identified the areas that should be enhanced during the next national communication. These include the improvement of existing data systems and enhancement of the capability of the system in supporting national communications to better meet the requirement for the development of national GHG inventory; and strengthening of data monitoring, including emission factors, to better reflect China's national circumstances. The collection of data on emission factors requires significant amount of work and capacity building in the field and the enhancement of quality control of inventory data. Another area that will require closer scrutiny is the choice of methods to assess the impacts of and adaptation to climate change in order to ensure that the methodological approaches chosen, including the relevant models, are more scientifically accurate and appropriate. . To reduce the uncertainties of the adaptation and vulnerability assessment, capacity-building is needed to understand the projections based on global climate models and the implications for China, to develop regional climate models suitable to China and to develop China's own climate change impact model. This proposed SNC project will enhance the capacity (through targeted training) of the relevant personnel involved in the development of national communications, with the ultimate goal of improving the quality of the national communication.

With continuous update of the science of climate change, the findings of the IPCC AR4, and the updated IPCC inventory guidelines, the extensive work required to formulate national communications and the technical capacity needed for the preparation of national communications in developing countries such as China has become greater. This would include financial and technical support for training and international exchanges to improve the technical level and capacity of Chinese experts in the formulation of a comprehensive and more solid national communications process. Greater efforts are needed to improve the compilation and quality control of the data used for national GHG inventory while R&D of its management system should be strengthened to sustain national GHG inventory work.

According to the provisions of the UNFCCC and the requirements of the relevant COP decisions on national communications from non-Annex I Parties, China needs to prepare its SNC in accordance with the *Guidelines for the Development of National Communications for non-Annex I Country Parties*. The revised guidelines mainly include the following: to develop a national GHG inventory for 2000; to provide information on anthropogenic emission sources of hydrofluorocarbons (HFCs), perfluorocarbon (PFCs) and Sulfur hexafluoride (SF<sub>6</sub>); to specify the methods and model tools used for assessing impacts of climate change and vulnerability and adaptation, including assumptions and uncertainties; and to provide information about the implemented or planned mitigation programmes and measures, etc. These new provisions and requirements provide guidance for the development of China's SNC.

The specific rationales for this proposed SNC project are the following:

- With regard to the development of a national GHG inventory: firstly, China is going to estimate emissions of three additional gases, i.e., HFCs, PFCs and SF<sub>6</sub>, which are new source categories in the inventory not covered in the 1994 inventory. Secondly, compared to the 1994 national GHG emissions, there are significant changes in such areas as energy, industrial processes, agriculture, forestry and waste, which need large amount of sampling and statistic analysis on the activity data. Thirdly, there will be in-depth studies, on-site monitoring and sample analysis on specific GHG emission factors to further reduce uncertainties of the inventory. And finally, the project will take further measures with regard to other relevant issues concerning GHG inventory such as the improvement of methodology, quality assessment and quality control, as well as the establishment of an inventory management system to facilitate the update of GHG emissions in the future.
- With regard to the management system of national GHG database, there are many inadequacies in the database set up in the INC project. Firstly, the development of national GHG inventory is undertaken by different institutions. Each institution established an inventory database based on its own requirements. But there is no unified database platform for management and analysis. Secondly, the databases were not based on a unified organizational structure, standard and criteria. Each database varies in terms of functions and data processing capability, which leaves a hidden problem for the collection, analysis and exchange of information. Thirdly, the development of each database aims only at the requirements for data processing and information storage. They do not take into account the requirements for updating GHG inventory, and the relevant management files and technical files of the project have not been stored. Thus there is an urgent need to ensure that information management and archiving is gradually expanded and adjusted into a system that facilitates the regular update of GHG inventories.

Development of systemic tools and procedures is a key objective of the SNC. This will include activities such as documenting methodologies, emissions factors and their applications, activity data and assumptions; data management and collection; systems for data archiving and record keeping.

This project will set up a unified database system under the current project, of which five sub-databases of energy, industry, agriculture, land-use change and forestry will be established and improved through capacity building and coordination among the relevant institutions. These sub-databases will include basic information about each emission source, data processing, source activity level, emission factors, calculation process of emissions and other background information. A formal coordination and communication system among these sub-databases will be ensured to facilitate the consolidation of the database for China's national GHG inventory.

China, as most developing countries, needs to strengthen its capability in model projection to simulate the projection and trajectories of economic growth and social changes in the long term. There is a need for more reliable projection of future GHG emissions in order to better understand emission trends. Therefore, to improve the capability in projecting GHG emissions, it is necessary for China to carry out capacity building activities in projection methods on GHG emissions in this proposed SNC Project. This will provide a better picture of emissions trends in terms of key GHG sources and the level of efforts that would be required to tackle such emissions in the medium and long terms.

With regards to climate change impacts and adaptation, due to the limitations of available assessment models and difficulties in obtaining data, currently the assessment on climate change impacts and vulnerabilities in China is preliminary and with considerable uncertainties. The findings of these assessments are not adequate to help the government formulate policies and measures to adapt to climate change. Therefore, to improve the understanding on the impact of and vulnerability to climate change and to reduce uncertainties, a more solid assessment of current climate variability and future climate change is required. For assessing the vulnerability and adaptation to climate change, China will consider to use the methodologies and guidelines recommended by the UNFCCC<sup>2</sup> to carry out impacts assessments and identify adaptation options, and to develop climate scenarios, as appropriate, that are more suitable to China. At the same time, apart from strengthening the study on the impacts of climate change on agriculture, water resources and terrestrial ecosystems, the SNC will assess the impacts of climate change on socio-economic development in coastal regions and human health.

With regards to general description about the progress of implementation of the UNFCCC, a systematic summary of the adopted policies and measures, especially relevant policies on mitigation

---

<sup>2</sup> Such as the *IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations*, the *UNEP Handbook on Methods for Climate Change Impact Assessment and Adaptation Strategies*, and the *International Handbook on Vulnerability and Adaptation Assessment and the UNDP Adaptation Policy Frameworks for Climate Change*.

and adaptation will be provided. The SNC will also describe the linkages between the specific contents of policies and measures with relevant parts of the national communications (e.g. national circumstances, emission inventory, technology transfer), and will provide a description of the national development priorities in the context of climate change. In accordance with Decision 17 of COP-8, China will include a description of the planning and policies for the implementation of the UNFCCC, addressing: (1) policies and measures to facilitate adequate adaptation to climate change, including methodological issues; (2) policy programs to mitigate climate change, including potential methodological issues. Therefore, it is expected that this project will enable China to carry out systematic analysis on the effects of implementation of relevant policies and measures on mitigation of and adaptation to climate change and further explore how to better plan and coordinate for integrating the policies and measures for mitigation of and adaptation to climate change into national economic and social development plan. Decision 17 of COP 8 also provides methodologies and guidelines for evaluation of adaptation strategies and measures<sup>3</sup> and assessment of measures to mitigate climate change<sup>4</sup>.

As the UNFCCC also applies to the Hong Kong and Macao SARs, the central government will include relevant information on climate change in the Hong Kong and Macao SARs, which will make China's SNC report more complete. The government of China will assign experts to help Hong Kong and Macao to compile their reports referring to China SNC report format. These reports will be chapters or attachments of China SNC report. The contents may include: climate change related circumstances, GHG inventory for 2005, assessment of impact of and vulnerability to climate change, policies and measures or action plans for mitigation and adaptation, and other information relevant to the achievement of the objective of the Convention.

The above challenging tasks and complex work cannot be accomplished through the SNC expedited process of the GEF. This project is consistent with the GEF Operational Program on "Enabling Activities (EA)" that pertains to the GEF "Climate Change" focal area. Following the procedures for full-size projects, China is thus requesting funding to the GEF on the amount of US\$ 5,850,000 for project activities, including US\$ 500,000 for the UNDP implementation fee and US\$ 350,000 for PDF-B. The Chinese Government will make US\$ 650,000 of in-kind contributions, including relevant costs of government staff, office facilities and supporting activities. The duration of the project implementation is tentatively about 4 years.

The expected project results and impacts include the following:

---

<sup>3</sup> Such as those contained in the *Compendium of Decision Tools to Evaluate Strategies for Adaptation to Climate Change* which is available from the UNFCCC web site, [www.unfccc.int/issues/meth\\_tools.html](http://www.unfccc.int/issues/meth_tools.html)

<sup>4</sup> Such as *Technologies, Policies and Measures for Mitigating Climate Change* (IPCC Technical Paper I); *Greenhouse Gas Mitigation Assessment: A Guidebook by the U.S. Country Studies Program; Climate Change 2001: Mitigation* (Contribution of Working Group III to the Third Assessment Report of the IPCC)



1. Comprehensive understanding of the GHG emissions from the different source categories as indicated by the UNFCCC Guidelines for non-Annex I National Communications;
2. Better capability of the country for modeling, analyzing and projecting future GHG emissions;
3. Country effective uses of GHG inventory tool, inventory information analysis and management;
4. Better understanding of China's vulnerability to the threats of climate change and predicted impacts in five sectors: agriculture, water resources, coastal resources, terrestrial ecosystems and human health;
5. Improving public awareness and informing policy-decision making on climate change;
6. Clear understanding of the GHG emissions and climate change situation in the Hong Kong and Macao SARs;
7. Support and useful inputs for climate change-integrated development planning both at the local and national levels;
8. China's fulfillment of its obligation under the UNFCCC; and,
9. Better guidance for the country in dealing with climate change vis-à-vis the country's sustainable development.

## **2.2. Project Goal, Objectives, Outcomes and Outputs/Activities**

The project will enable China to better fulfill its obligations specified in the Convention and prepare and submit the SNC to the UNFCCC in accordance with Article 12 of the Convention and Decision 17 of COP8; improve the capability of China in the development, systematic renewal and utilization of national communications and relevant knowledge; enable China to effectively put in place *China's National Climate Change Programme* and make new contributions to mitigation of global climate change based on national conditions and sustainable development strategy and policy. The overall objective is strengthened capacity to further integrate climate change concerns into national and sectoral development priorities while fulfilling obligations to the UNFCCC.

The proposed project is composed of 6 major components. The first component is the inventory of GHG emissions, development of GHG inventory database and GHG Emission forecasting & modeling systems, which includes 7 sub-components: the first five sub-components are the development of national GHG inventory of five specific source categories; the sixth sub-component is the completion of the development of China's GHG database management system, and the seventh sub-component is the improvement of the methodology projecting the GHG emissions in China. The second component is the completion of the assessment of the impacts of climate change on China and its vulnerabilities. The third component aims to further improve public awareness on climate change. The fourth component will present relevant climate change information of Hong Kong SAR and Macao SAR. The fifth component includes supplementary support activities for achieving the UNFCCC objectives. The last component is the publication and dissemination of the document on the Second National Communication of China to the UNFCCC.

**Component 1: Inventory of GHG Emissions and Development of GHG Inventory Database, and Emission Forecasting Modeling Systems** – This project component is aimed at providing a clear and updated understanding of the magnitude of GHG emissions from the energy, industry, agriculture, waste, and land use change and forestry sectors of China. It is also intended to enhance the capability of the country in modeling, analyzing and projecting future GHG emissions, and to enable the country to effectively use GHG inventory tool, inventory information analysis and management for climate change-integrated development planning.

### **Output 1.1: Inventory of GHG Emissions**

This major output will involve the completion of the 2005 GHG inventories in the energy sector, industrial processes, agricultural sector, land use change and forestry, and wastes. The GHGs that will be covered in the inventories are Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrous Oxide (N<sub>2</sub>O); Sulfur Hexafluoride (SF<sub>6</sub>), (Perfluorocarbons (PFCs), and (Hydrofluorocarbons (HFCs). The inventory of GHG emissions in the energy sector will cover CO<sub>2</sub> that are emitted from fossil fuel combustion; CO<sub>2</sub> from biomass energy combustion; CH<sub>4</sub> fugitive emissions from coal mining and post-mining activities; CH<sub>4</sub> fugitive emissions of oil and gas system. In the industrial sector, the following inventories will be covered: (1) CO<sub>2</sub> emissions from cement production; (2) CO<sub>2</sub> emissions from lime production; (3) CO<sub>2</sub> emissions from iron and steel production; (4) CO<sub>2</sub> emissions from calcium carbide production; (5) N<sub>2</sub>O emissions from adipic acid production; (6) N<sub>2</sub>O emissions from nitric acid production; (7) PFC emissions from aluminum production; (8) SF<sub>6</sub> emissions from magnesium production; (9) SF<sub>6</sub> emissions from electrical equipments and other sources; (10) PFC, HFC and SF<sub>6</sub> emissions from semiconductor manufacturing; and, (11) PFC and HFC emissions from production and use of Substitutes for Ozone Depleting Substances (ODS Substitutes). In the agricultural sector, the GHG inventories will cover: (1) CH<sub>4</sub> emissions from paddy fields; (2) N<sub>2</sub>O emissions from croplands; (3) CH<sub>4</sub> emissions from enteric fermentation in domestic livestock; and, (4) CH<sub>4</sub> and N<sub>2</sub>O emissions from animal manure management system. Using the IPCC Guidelines, the inventory emissions from land use change and forestry will cover emissions by sources and removals by sinks due to changes of carbon in forest and other woody biomass stocks, forest conversion and changes in soil carbon. In the area of waste management, the inventories will cover emissions of: (1) CH<sub>4</sub> from landfills; (2) CO<sub>2</sub> from waste incineration; (3) CH<sub>4</sub> from industrial wastewater treatment; (4) CH<sub>4</sub> from domestic wastewater treatment; and, (5) N<sub>2</sub>O from wastewater/sewage treatment.

**Activity 1.1: Inventory of GHG Emissions** – This major activity will involve the completion of the 2005 GHG inventories in the energy sector, industrial processes, agricultural sector, land use change and forestry, and wastes. The GHGs that will be covered in the inventories are Carbon Dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrous Oxide (N<sub>2</sub>O); Sulfur Hexafluoride (SF<sub>6</sub>), (Perfluorocarbons (PFCs), and (Hydrofluorocarbons (HFCs). The inventory of GHG emissions in the energy sector will cover CO<sub>2</sub> that are emitted from fossil fuel combustion; CO<sub>2</sub> from biomass energy combustion; CH<sub>4</sub> fugitive emissions from coal mining and post-mining activities; CH<sub>4</sub> fugitive emissions of oil and gas system.

In the industrial sector, the following inventories will be covered: (1) CO<sub>2</sub> emissions from cement production; (2) CO<sub>2</sub> emissions from lime production; (3) CO<sub>2</sub> emissions from iron and steel production; (4) CO<sub>2</sub> emissions from calcium carbide production; (5) N<sub>2</sub>O emissions from adipic acid production; (6) N<sub>2</sub>O emissions from nitric acid production; (7) PFC emissions from aluminum production; (8) SF<sub>6</sub> emissions from magnesium production; (9) SF<sub>6</sub> emissions from electrical equipments and other sources; (10) PFC, HFC and SF<sub>6</sub> emissions from semiconductor manufacturing; and, (11) PFC and HFC emissions from production and use of Substitutes for Ozone Depleting Substances (ODS Substitutes). In the agricultural sector, the GHG inventories will cover: (1) CH<sub>4</sub> emissions from paddy fields; (2) N<sub>2</sub>O emissions from croplands; (3) CH<sub>4</sub> emissions from enteric fermentation in domestic livestock; and, (4) CH<sub>4</sub> and N<sub>2</sub>O emissions from animal manure management system. Using the IPCC Guidelines, the inventory emissions from land use change and forestry will cover emissions by sources and removals by sinks due to changes of carbon in forest and other woody biomass stocks, forest conversion and changes in soil carbon. In the area of waste management, the inventories will cover emissions of: (1) CH<sub>4</sub> from landfills; (2) CO<sub>2</sub> from waste incineration; (3) CH<sub>4</sub> from industrial wastewater treatment; (4) CH<sub>4</sub> from domestic wastewater treatment; and, (5) N<sub>2</sub>O from wastewater/sewage treatment.

For each of these sectors where inventories will be carried out, emissions inventory database will be created and quantitative uncertainties assessments will be carried out.

### **Output 1.1.1: GHG Inventory of the Energy Sector**

The following activities will be carried out to facilitate and come up with the inventory of GHG emissions from the energy sector in China:

#### **Activity 1.1.1.1: Inventory of GHG emissions from fossil fuel combustion**

**a. Development of the 2005 China Energy Balance** - This will mainly involve the collection and analysis of data on the various activity levels related to fossil fuel combustion in China during the year 2005. The data that will be collected includes the production, supply and consumption of all types of energy carriers in China. Detailed data will be collected on the energy consumption in each end-use sector, by energy type, and by energy device. Data on energy carriers that are used for non-energy purposes (e.g., as industrial process raw material) will also be collected. A specific database for these various energy activity levels will be developed, operated and maintained. The data collected will be used in updating the China Energy Balance, which will also be improved and modified in order to integrate the data requirements for the GHG inventory.

**b. Establishment of the typical properties of coals in China** - This activity is mainly to establish the thermal and chemical properties of coals mined, produced and used in the country. Specific data on the thermal properties (e.g., heating value) and chemical properties (e.g., ultimate analysis) will be generated from laboratory tests and gathered from published/reported data for each category of coal

(e.g., anthracite, bituminous, coking coal, lignite) that are found in the country. Data will also be gathered regarding the coal industry and market in the country (production, distribution, exports) covering the various coal mines to the different distribution, sales and consumption areas. A comprehensive study of the coal market will be carried out, which will involve a detailed analysis of the coal distribution and sale flows, as well as the coal quality monitoring done by the relevant quality supervision agency of the government. Furthermore, this activity will establish the appropriate CO<sub>2</sub> emission factors from the combustion of different types of coals in China taking into consideration their respective thermal and chemical properties and types of applications.

**c. Establishment of the GHG emissions characteristics of boilers used in utilities and industries-**

This activity will involve the conduct of research and study to establish the combustion characteristics of fossil fuels used in utility and industrial boilers. The research will include fuel combustion testing of different fossil fuel-fired utility boilers. This is to establish the GHG emissions characteristics from these types of equipment, as well as the combustion characteristics (e.g., flue gas analyses, combustion efficiency, unburned carbon fraction in the flue gas and residues) under different combustion conditions. The study will gather operating data of existing fossil fuel-fired utility and industrial boilers in the country. Data gathering will be carried out, as feasible, through inspections (e.g., walkthrough audits) of such equipment in selected utilities and industrial plants in the country, as well as through a survey that will be designed and carried out in utility and industrial facilities that operate fossil fuel-fired boilers. The collected data from the inspections and the surveys, will be used for analyzing the combustion performance (through material and heat balances) thereby establishing the CO<sub>2</sub> emissions from these types of boilers. The actual inspections will be part of case studies that will be carried out under this activity aimed at enhancing the local capacity in boiler performance evaluation, determining applicable local emission factors for utility and industrial boilers, and carrying out GHG inventories for these types of energy consuming equipment.

**d. Establishment of Nitrous Oxide (N<sub>2</sub>O) and CH<sub>4</sub> emission factors for fossil fuel combustion -**

This activity focuses on the N<sub>2</sub>O and CH<sub>4</sub> emissions from the combustion of fossil fuels (petroleum-based and natural gas) in the transport sector, as well as those in the energy transformation sector. It will involve the conduct of research and analysis as part of a comprehensive study to establish the N<sub>2</sub>O and CH<sub>4</sub> emission factors for fossil fuels combustion in the country. The research will involve emissions testing of transport vehicles running on petroleum fuels and natural gas, as well as liquid and gaseous fuel-fired equipment in the oil industry (e.g., gas fired furnaces) and in the power sector (e.g., gas turbines). The study will involve gathering operating data of existing liquid and/or gas fuel -fired equipment and devices in selected entities within the transport and energy transformation sectors. The test data and those collected from selected companies within these 2 major sectors will be used for analyzing the N<sub>2</sub>O and CH<sub>4</sub> emissions from these types of energy consuming equipment/devices. The study will also contribute to enhancing the local capacity in combustion performance evaluation, determining the N<sub>2</sub>O and CH<sub>4</sub> emission factors for fossil fuel-fired equipment/devices used in the transport and energy transformation sectors, and carrying out GHG inventories for these types of energy consuming equipment.

**e. Compilation of the China 2005 GHG emission inventory from fossil fuel combustion** - From the data and information gathered in Activities 1.1.1.1.a to 1.1.1.1.d, as well as the applicable local emission factors, analyses will be carried out to calculate the CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub> emissions from fossil fuel combustion in China. Quantitative assessment for inventory uncertainty will also be performed.

#### **Activity 1.1.1.2: Inventory of GHG emissions from biomass energy combustion**

**a. Collection of data on biomass energy consumption** - This will involve the collection and analysis of data on the various uses of biomass energy in China and the actual biomass energy consumption and performance for each of these uses. The data that will be gathered will be mainly on the amount of biomass consumed for each major biomass consuming activities (e.g., household cooking, heating and drying processes in TVEs, brick making, steam generation, etc), as well as the actual quantities of each type of biomass used (e.g., firewood, wood waste, agricultural residues, bagasse, municipal waste, animal waste, etc) to establish activity data of biomass energy combustion. A limited survey of the production and consumption of biomass will be carried out in regions of the country where the biomass resources are abundant and are widely used. Also, available data from government agencies and even private sector entities and NGOs involved in activities related to biomass (e.g., biomass surveys) will be utilized as appropriate.

**b. Establishment of the typical properties of biomass resources in China** - This activity is mainly to establish the physical, thermal and chemical properties of biomass resources used in the country. Specific data on the thermal properties (e.g., heating value) and chemical properties (e.g., ultimate analysis) will be generated from laboratory tests and gathered any published/reported data for each type of biomass (e.g., rice hull, bagasse, animal waste, municipal waste, etc.) that are found in the country. Data will also be gathered to map out parts of the country where this resource is abundant, how much is the potential and how much is utilized annually. Where applicable, data will also be gathered regarding how these biomass resources are utilized and how much are utilized if not used for energy purposes (e.g., disposed, converted to value added items).

**c. Establishment of N<sub>2</sub>O and CH<sub>4</sub> emission factors for biomass energy combustion** - This will entail the conduct of a study to determine the local N<sub>2</sub>O and CH<sub>4</sub> emission factors for biomass energy combustion, focusing on emission factors by major biomass combustion devices and by biomass types (e.g., firewood, stalk, and animal waste). A research study will be conducted to establish the combustion characteristics of biomass fuels used in biomass-fired equipment/devices used in households, agriculture and in industries, particularly TVEs. The research will involve combustion performance testing of different biomass-fired equipment/devices (e.g., brick kilns, cook stoves). This is to determine and quantify the various GHG emissions from these types of equipment, particularly the N<sub>2</sub>O and CH<sub>4</sub> emissions under different combustion conditions. The collected data both from the combustion performance actual inspections and from the survey will be used for

analyzing the N<sub>2</sub>O and CH<sub>4</sub> emission factors from the combustion of biomass in biomass-fired equipment/devices. The combustion testing will be part of the research study that is also aimed at enhancing the local capacity in biomass-fired equipment/device performance evaluation, determining applicable local emission factors for N<sub>2</sub>O and CH<sub>4</sub>, and carrying out GHG inventories for these types of energy consuming equipment.

**d. Compilation of the China 2005 GHG emission inventory from biomass fuel combustion -**

From the data and information gathered in Activities 1.1.1.2.a to 1.1.1.2.c, as well as the applicable local emission factors, analyses will be carried out to calculate the N<sub>2</sub>O and CH<sub>4</sub> emissions from biomass fuel combustion in China. Quantitative assessment for inventory uncertainty will also be performed.

**Activity 1.1.1.3: Inventory of CH<sub>4</sub> emissions from coal mining and post-mining activities**

**a. Collection of data on the local coal mining and post-mining activities -** This activity will involve the conduct of a research study on the level of activities in the coal mining and post-mining operations in the country. Data on raw coal production, cleaned/beneficiated coal production, energy consumption in the mining and post-mining operations, distribution and sales of coal will be collected through actual inspections of selected coal companies, or from data provided on the same by the coal companies. The research study will focus on underground and open cast coal mines, with emphasis on high-gassy and outburst mines.

**b. Characterization of the nature and quantities of CH<sub>4</sub> emissions from, and utilization of, CH<sub>4</sub> in coal mining activities –** Actual measurements to determine the amount (i.e., volumetric flow rate) and quality (%CH<sub>4</sub> content) of the CH<sub>4</sub> gas that are produced at various site and operational conditions (e.g., production rates) in the coal mining operations of different types of mines and post-mining facilities, as well as from each type of coal beds/seams, will be carried out. Data (if any) gathered by coal mines regarding the amount of CH<sub>4</sub> generated from the coal mining and post-mining operations will also be collected, as well as available data on CH<sub>4</sub> gas recovery either for flaring or for use. Quantification of CH<sub>4</sub> gas that are generated, recovered, flared and/or used will be done, on a case study basis, in selected coal mines that have CH<sub>4</sub> recovery systems. The analysis will help establish the performance of different CH<sub>4</sub> recovery systems in coal mines. The research study will also involve the development of monitoring procedures for measurement of coal bed/seam CH<sub>4</sub> emissions, as well as recovered, flared and/or utilized CH<sub>4</sub> gas. All of these are important items that would contribute to the capacity development of the relevant government agencies and the coal mining sector in the inventory of CH<sub>4</sub> emissions from coal mining and post-mining activities.

**d. Establishment of CH<sub>4</sub> emission factors for coal mining and post-mining activities -** This activity will involve the utilization of data gathered in Activity 1.1.1.3.a and those that were generated from analyses done in Activity 1.1.1.3.b in characterizing the nature (e.g., concentrations, volumetric flow rates) of the CH<sub>4</sub> emissions from coal mining and post-mining operations in various

types of mines (including gas outburst mine, high gas mine, township coal mine). Based on the analyses that will be carried out, CH<sub>4</sub> emission factors will be determined and established for underground and open cast coal mining, as well as for post-mining activities.

**e. Compilation of China's 2005 CH<sub>4</sub> emission inventory of coal-mining and post-mining activities** - From the data and information gathered in Activities 1.1.1.3.a to 1.1.1.3.c, as well as the applicable local emission factors, analyses will be carried out to calculate the CH<sub>4</sub> emissions from coal mining and post-mining activities in China. Quantitative assessment for inventory uncertainty will also be performed.

#### **Activity 1.1.1.4: Inventory of CH<sub>4</sub> fugitive emissions from oil and gas system**

**a. Collection of data on CH<sub>4</sub> fugitive emissions in oil and gas systems** – This activity will involve the conduct of a research study on the level of activities in the oil and gas industry in China where fugitive CH<sub>4</sub> emissions are generated. It will also involve the measurement of oil and gas consumption in the operations of in the oil and gas industry. Data on the quantities of oil and gas produced from onshore and offshore oil wells, gas that is flared, oil and gas that are treated and processed in gathering stations, throughput rates of crude oil and petroleum products production rates in oil refineries, oil and gas stored and transported, etc will be gathered. The same will be done at the downstream operations involving the distribution and sale of oil and gas products. Data on the amount of oil and gas that are used in the various oil and gas operations will also be gathered. These data will be collected through actual inspections of at least 1 oil and gas company, or from data provided on the same by all oil and gas companies in the country. The research study is meant to establish the various activity data of oil and gas exploration, mining development, mining and gathering, oil transportation, refinery and storage, natural gas processing, transportation, distribution and consumption, as well as activity data of other oil and gas consumption activities.

**b. Characterization of the nature and quantities of fugitive CH<sub>4</sub> emissions from oil and gas systems** – Actual measurements to determine the amount (i.e., volumetric flow rate) and quality (%CH<sub>4</sub> content) of the CH<sub>4</sub> gas that are produced at various site and operational conditions (e.g., production rates) in the oil and gas operations in offshore and onshore oil and gas facilities will be carried out. Any available data collected by oil and gas companies regarding the amount of fugitive CH<sub>4</sub> emissions in their operations will also be collected, as well as available data on fugitive CH<sub>4</sub> emission control systems. Quantification of CH<sub>4</sub> gas that are generated, recovered, flared and/or used will be done, on a case study basis, in an oil production facility and a gas production facility that have fugitive CH<sub>4</sub> control systems. The analysis will help establish the performance of different fugitive CH<sub>4</sub> control systems in the oil and gas industry. The research study will also involve the development of monitoring procedures to measure fugitive CH<sub>4</sub> emissions. All of these are important items that would contribute to the capacity development of the relevant government agencies and the oil and gas industry in the inventory of fugitive CH<sub>4</sub> emissions from oil and gas mining, production, transport and distribution activities, as well as in the utilization of oil and gas within the industry.

**c. Establishment of fugitive CH<sub>4</sub> emission factor for oil and gas systems** - This activity will involve the utilization of data gathered in Activity 1.1.1.4.a and those that were generated from analyses done in Activity 1.1.1.4.b in characterizing the (e.g., concentrations, volumetric flow rates) fugitive CH<sub>4</sub> emissions from the exploration, mining, production, transport and distribution of oil and gas, including in the utilization of oil and gas within the oil and gas industry. Based on the analyses that will be carried out, fugitive CH<sub>4</sub> emission factors will be determined and established for the various activities in the oil and gas industry.

**d. Compilation of China's 2005 CH<sub>4</sub> fugitive emission inventory of oil and gas systems** - From the data and information gathered in Activities 1.1.1.4.a to 1.1.1.4.c, as well as the applicable local emission factors, analyses will be carried out to calculate the fugitive CH<sub>4</sub> emissions from the exploration, mining, production, transport and distribution activities, as well as the oil and gas consuming activities, within the oil and gas industry in China. Quantitative assessment for inventory uncertainty will also be performed.

#### **Activity 1.1.1.5: Finalization of China's 2005 GHG inventory of the energy sector**

**a. Preparation of the draft China's 2005 GHG emission inventory of the energy sector** – This activity will involve the synthesis of the 4 energy sub-sector GHG emission inventories (Activities 1.1.1.1.e, 1.1.1.2.d, 1.1.1.3.d and 1.1.1.4.d). A summary of the intermediate outputs under each sub-sector inventory (e.g., measurement procedures, case studies, research studies, activity data and local emission factors) will also be prepared. The draft synthesis will be used in the review of the 2005 energy sector GHG inventory.

**b. Conduct of the energy sector GHG emission inventory review** - This will involve the organization and conduct of a workshop to review the results of the data gathering activities, the findings of the research studies, the established emission factors and activity data, and the 2005 GHG emission inventory for each sub-sector. Parallel discussions for each sub-sector will be carried out during the workshop, which is expected to involve individuals and group of individuals who are experts in each sub-sector, as well as the main stakeholders in each sub-sector. The discussions on each sub-sector will involve review and comments on the data gathering methods used, primary and secondary data used, analyses done, methodologies that were developed and used, activity data that were established and the emission factors that were used and the inventory compiling methodology used. The proceedings of all discussions in each sub-sector will be fully documented. The SNC Team will also carry out one-on-one consultations and listen to the concerns and goals of the entities within each sub-sector, in view of the GHG inventory, and their proposed actions to assist in future inventories, as well as in mitigating further emissions in their respective sub-sectors in the future.

**c. Finalization of the 2005 GHG emission inventory of the energy sector** - This activity will involve the SNC Team finalizing the documentation of the data gathered, generated and used for the



inventory. The team will finalize and document the sub-sectoral inventories, as well as the GHG inventory of the energy sector considering all inputs from the consultations during the review workshop. The finalized inventory will form part of China's 2005 National GHG Emissions Inventory.

### **Output 1.1.2: Inventory of GHG emissions from industrial processes**

The following are the activities that will be carried out in the inventory of GHG emissions from industrial processes in China:

#### **Activity 1.1.2.1: Inventory of GHG emissions from cement production**

**a. Collection of the activity data of China's cement production** – The activity data will mainly be on cement and clinker production in 2005. Due to the lack of statistics on clinker production (available is cement production), clinker production data will be estimated by using a ratio of clinker to cement, which will be determined by careful studies including sample tests, case studies, literature review and expert consultation.

**b. Evaluation of the CO<sub>2</sub> emission factors of cement production in China** – Research work will be carried out to gather and analyze quality test data on calcium oxide and magnesia contents in cement clinker. The data will be collected through general survey of cement plants, and then the respective mean content of calcium oxide and magnesia in the clinker will be calculated, as well as the relevant emission factor.

**c. Estimation and compilation of GHG emissions from cement production** - Tier 2 method as prescribed by the IPCC Guidelines will be used in the CO<sub>2</sub> emission calculations based on the clinker production. Analyses will be carried out to calculate the industry wide CO<sub>2</sub> emissions in 2005. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (hereinafter referred to IPCC Good Practice Guidance).

#### **Activity 1.1.2.2: Inventory of GHG emissions from lime production**

**a. Collection of the activity data of China's lime production** – The activity data will mainly be on lime production in 2005. The activity data will be collected through a general survey and from expert advice since China has not yet established a systematic statistical data gathering for the lime industry.

**b. Evaluation of the CO<sub>2</sub> emission factors of cement production in China** – Research work will be carried out to gather and analyze the mean contents of calcium oxide and magnesia contents in lime, and establish the relevant emission factor. The data will be collected through general survey of lime manufacturing plants

**c. Estimation and compilation of GHG emissions from lime production** - Analyses will be carried out to calculate the lime industry CO<sub>2</sub> emissions in 2005. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

#### **Activity 1.1.2.3: Inventory of GHG emissions from iron and steel production**

**a. Collection of the activity data of China's iron & steel production** – The activity data will mainly be on the production of pig iron and steel (by types) in 2005. The activity data will be collected from available statistical data and supplemented by a general survey of iron and steel companies. Fluxing and reducing agents consumption data will be collected through extensive investigation in individual iron and steel plants, and the average specific consumption of fluxing and reducing agents per unit output of iron and steel will be established for the whole sector.

**b. Evaluation of the CO<sub>2</sub> emission factors for iron and steel production in China** – Research work will be carried out to establish the content of calcium carbonate and magnesium carbonate in fluxing agents. Information on the carbon content in different types of pig iron and crude steel will be collected through sample tests and general survey of individual iron & steel plants. With the calculated data the relevant emission factors will be established.

**c. Estimation and compilation of GHG emissions from iron and steel production** - Analyses will be carried out to calculate the country's iron and steel industry CO<sub>2</sub> emissions in 2005. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

#### **Activity 1.1.2.4: Inventory of GHG emissions from calcium carbide production**

**a. Collection of the activity data of China's calcium carbide production** – Information on national total calcium carbide production (by manufacturing techniques) as well as information on the use of calcium carbide, generation rate of calcium hydroxide and dissolved acetylene per unit consumption of calcium carbide will be collected through the conduct of surveys in CaC<sub>2</sub> manufacturers and consumers. The activity data will be calculated based on the data gathered and on expert advice.

**b. Evaluation of the CO<sub>2</sub> emission factors for calcium carbide production and consumption in China** – Information on technical economic indices of calcium carbide production as well as raw material consumption, composition and feed ratio will be collected through a general survey of CaC<sub>2</sub> manufacturers. The emissions factor for calcium carbide production will be estimated using the data gathered. Moreover, information on the quality test data of the quicklime used in CaC<sub>2</sub> manufacturing will also be collected to determine the emissions factor of the quicklime; emission factors of dissolved acetylene and the CO<sub>2</sub> absorption factors of calcium hydroxide will be determined via the information on quality data of calcium carbide.

**c. Estimation and compilation of GHG emissions from adipic acid production** - Analyses will be carried out to calculate the country's adipic acid industry CO<sub>2</sub> emissions in 2005. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

#### **Activity 1.1.2.5: Inventory of GHG emissions from adipic acid production**

**a. Collection of the activity data of China's adipic acid production** – This will involve the gathering of data on the yearly amounts of adipic acid produced in China through a complete survey of individual adipic acid factories in China. The activity data will be calculated based on the data gathered and on expert advice.

**b. Evaluation of the N<sub>2</sub>O emission factors of adipic acid production** – Among the data that will be collected during the survey of adipic acid factories in the country are information on N<sub>2</sub>O emissions from the adipic acid production processes. Research will also be carried out on the effects of production capacity factor in the amount of N<sub>2</sub>O emissions generated. From the data gathered and the results of the researches conducted, the N<sub>2</sub>O emission factors of adipic acid production will be evaluated and established.

**c. Estimation and compilation of GHG emissions from adipic acid production** - Analyses will be carried out to calculate the country's adipic acid industry N<sub>2</sub>O emissions in 2005. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

#### **Activity 1.1.2.6: Inventory of GHG emissions from nitric acid production**

**a. Collection of the activity data of China's nitric acid production** – This will involve the gathering of data on the annual quantities of nitric acid produced in China through a complete survey of individual nitric acid factories in China. The activity data (i.e., nitric acid production quantities) will be calculated based on the data gathered and on expert advice.

**b. Evaluation of the N<sub>2</sub>O emission factors of nitric acid production** – Among the data that will be collected during the survey of nitric acid factories in the country are information on N<sub>2</sub>O emissions from the nitric acid production processes. Research will also be conducted to determine the impacts of varying production loads on the amount of N<sub>2</sub>O emissions generated. From the data gathered and the results of the researches conducted, the N<sub>2</sub>O emission factors of nitric acid production will be evaluated and established.

**c. Estimation and compilation of GHG emissions from nitric acid production** - Analyses will be carried out to calculate the country's nitric acid industry N<sub>2</sub>O emissions in 2005. Quantitative

assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

#### **Activity 1.1.2.7: Inventory of GHG emissions from aluminum production**

**a. Collection of the activity data of aluminum production in China** – This will involve the gathering of data on the volume of aluminum production in China. A general survey of aluminum plants in China will be carried out to gather information on the amount of aluminum production by various manufacturing processes. Information will also be gathered on the PFC emission control measures that are applied. The activity data (i.e., aluminum production quantities) will be calculated based on the data gathered for each type of production process.

**b. Evaluation of the PFC emission factors for aluminum production in China** – Research work will be carried out to study the impacts of production capacity factors on the amounts of PFC emissions generated in each aluminum manufacturing production processes. Based on the survey data gathered and the results of the researches conducted, emissions factors of different aluminum manufacturing processes and applied emission control technologies will be evaluated. The evaluation will be supplemented by special investigations of representative aluminum plants and expert advice.

**c. Estimation and compilation of GHG emissions from aluminum production** - Analyses will be carried out to calculate the country's aluminum industry PFC emissions in 2005. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

#### **Activity 1.1.2.8: Inventory of GHG emissions from magnesium production**

**a. Collection of the activity data of magnesium production in China** – This will involve the gathering of data on the annual quantities of magnesium produced in China. A general survey of magnesium plants in China will be carried out to gather information on the amount of magnesium production by various manufacturing and casting processes. Information will also be gathered on the amounts of SF<sub>6</sub> emissions from the production and casting processes. The activity data (i.e., magnesium production quantities) will be calculated based on the data gathered for each type of production process.

**b. Evaluation of the SF<sub>6</sub> emission factors for magnesium production in China** – Research work will be carried out to study the impacts of production capacity factors on the amounts of SF<sub>6</sub> emissions generated in each magnesium production and casting processes. Based on the survey data gathered and the results of researches conducted, emissions factors of different magnesium production and casting processes will be evaluated. The evaluation will be supplemented by special investigations of representative magnesium plants and expert advice.

**c. Estimation and compilation of GHG emissions from magnesium production** - Analyses will be carried out to calculate the country's magnesium industry SF<sub>6</sub> emissions in 2005. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

**Activity 1.1.2.9: Inventory of GHG emissions from the manufacturing of electrical equipment and related products**

**a. Collection of the activity data of electrical equipment production in China** – This will involve the gathering of data on the annual production of electrical equipment, including volume of equipment on active service, retired equipment, newly-installed equipment and equipment mean lifetime. These data will be gathered through consumer surveys and a general survey of the electrical equipment manufacturing industry. A specific survey design will be prepared to be used for the survey, which will include questions on the amounts of SF<sub>6</sub> used in the manufacturing process, amounts of SF<sub>6</sub> used to recharge electrical equipment during service, and average quantities of residual SF<sub>6</sub> in decommissioned equipment. Inputs from experts in the industry regarding SF<sub>6</sub> utilization will also be used. The relevant activity data will be calculated based on the data gathered.

**b. Evaluation of the SF<sub>6</sub> emission factors of electrical equipments and other related sources** – Research work will be carried out to study the nature of SF<sub>6</sub> emissions from electrical equipments and other SF<sub>6</sub> using equipment. Based on the established activity data and on the quantities of SF<sub>6</sub> usage (i.e., charged in new equipment, recharged in existing equipment and residual in decommissioned equipment), and results of the researches conducted, the relevant SF<sub>6</sub> emission factors will be evaluated. The evaluation will be supplemented by special investigations of representative electrical equipment manufacturing plants and expert advice.

**c. Estimation and compilation of GHG emissions from electrical equipment production** - Analyses will be carried out to calculate the country's electrical equipment industry SF<sub>6</sub> emissions in 2005. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

**Activity 1.1.2.10: Inventory of GHG emissions from the manufacturing of semiconductors**

**a. Collection of the activity data of semiconductor manufacturing in China** – This will involve the gathering of data on specific processes in the semiconductor industry in China, in particular the etching and cleaning of semiconductors. A survey design will be prepared that will be employed in the semiconductor industry to determine quantities of semiconductors etched and cleaned will be gathered, along with the quantities of PFC, HFC and SF<sub>6</sub> used and emitted from such processes, and the type and performance of emission controls applied. The relevant activity data will be calculated based on the data gathered.

**b. Evaluation of the PFC, HFC and SF<sub>6</sub> emission factors of semiconductor manufacturing** – Research work will be carried out to study the nature and factors influencing emissions of PFC, HFC and SF<sub>6</sub> from the manufacture of semiconductors. Based on the results of the researches conducted, the survey data gathered and the established activity data, the emission factors related to PFC, HFC and SF<sub>6</sub> use rate for the etching and cleaning processes and emission control efficiency will be established. The evaluation will be supplemented by special investigations of representative semiconductor manufacturing plants and expert advice.

**c. Estimation and compilation of GHG emissions from semiconductor manufacturing** - Analyses will be carried out to calculate the country's semiconductor industry's PFC, HFC and SF<sub>6</sub> emissions in 2005. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

**Activity 1.1.2.11: Inventory of GHG emissions from the manufacture of Ozone Depleting Substances (ODS) Substances**

**a. Collection of the activity data of ODS substances manufacturing and consumption in China-** This will involve the gathering of data on the production and consumption data of ODS substitutes. A general survey of ODS substitute manufacturing plants and industries that utilize ODS substitutes will be carried out to establish, among others, the quantities of ODS substitutes production, number of equipment in service using ODS substitutes, number of newly-installed equipment and decommissioned equipment, annual quantities of ODS substitutes used to charge the new equipment and recharge the in-service equipment, and the average fraction of residual ODS substitutes in decommissioned/retired equipment. The relevant activity data will be calculated based on the data gathered. Information from experts in the area of ODS substitutes applications will also be used for establishing the relevant activity data.

**b. Evaluation of the PFC and HFC emission factors of ODS substitutes manufacturing and consumption** – Based on the survey data gathered and the established activity data, the emission factors related to PFC and HFC production, consumption (charged for new equipment and recharged for existing equipment) and residuals in decommissioned equipment will be established. The evaluation will be supplemented by special investigations of representative ODS substitute manufacturing plants as well as producers of ODS substitute using equipment and expert advice.

**c. Estimation and compilation of GHG emissions from ODS substitutes manufacturing and consumption** - Analyses will be carried out to calculate the country's ODS substitutes manufacturing industry's PFC and HFC emissions in 2005. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

### **Activity 1.1.2.12: Finalization of China's 2005 GHG inventory of the industry sector**

**a. Preparation of the draft China's 2005 GHG emission inventory of the industry sector** – This activity will involve the synthesis of the 10 industry sub-sector GHG emission inventories (Activities 1.1.2.1.c to 1.1.2.10.c). A summary of the intermediate outputs under each sub-sector inventory (e.g., test and measurement procedures, survey designs, research studies, activity data and local emission factors) will also be prepared. The draft synthesis will be used in the review of the 2005 industry sector GHG inventory.

**b. Conduct of the industry sector GHG emission inventory review** - This will involve the organization and conduct of a workshop to review the results of the data gathering activities, the findings of the research studies, the established emission factors and activity data, and the 2005 GHG emission inventory for each sub-sector. Parallel discussions for each sub-sector will be carried out during the workshop, which is expected to involve individuals and group of individuals who are experts in each sub-sector, as well as the main stakeholders in each sub-sector. The discussions on each sub-sector will involve review and comments on the data gathering methods used, primary and secondary data used, analyses done, methodologies that were developed and used, activity data that were established and the emission factors that were used and the inventory compiling methodology used. The proceedings of all discussions in each sub-sector will be fully documented. The SNC Team will also carry out one-on-one consultations and listen to the concerns and goals of the entities within each sub-sector, in view of the GHG inventory, and their proposed actions to assist in future inventories, as well as in mitigating further emissions in their respective sub-sectors in the future.

**c. Finalization of the 2005 GHG emission inventory of the industry sector** - This activity will involve the SNC Team finalizing the documentation of the data gathered, generated and used for the inventory. The team will finalize and document the sub-sectoral inventories, as well as the GHG inventory of the industry sector considering all inputs from the consultations during the review workshop. The finalized inventory will form part of China's 2005 National GHG Emissions Inventory.

### **Output 1.1.3: Inventory of GHG emissions from agricultural sector**

The following are the activities that will be carried out in the inventory of GHG emissions from agricultural processes in China:

#### **Activity 1.1.3.1: Inventory of CH<sub>4</sub> emissions from rice paddies**

**a. Data collection, processing and analysis and establishment of activity data** – This will involve the conduct of survey and data gathering on rice cultivation and management, including planting regime, planting area, rice cultivars, field irrigation, fertilizer application, straw incorporation and manure application, and data of climate and soil. These data will be validated through selected field

measurements and consultations with experts. A database will be developed to store all the collected/surveyed data including test and observed data. These data will be used to develop a reliable model to quantify the activity data (i.e., rice production areas per variety/type of rice); to evaluate the relevant CH<sub>4</sub> emission factor; and, to quantify the CH<sub>4</sub> emissions. In order to sustain the GHG inventory work in this area, the exercise will be integrated into the data gathering work on rice cultivation and management of the national agriculture statistical system.

**b. Measurement of methane emissions from PWLW (paddies water-logged in winter)** – This will involve the conduct of survey for PWLW acreage and for other parameters that specifically affect/influence CH<sub>4</sub> emissions from PWLW. Similar data available in existing statistical reports in the agriculture sector will also be collected. Aerial and/or satellite observations of the sites will be performed to obtain more accurate data and reduce the CH<sub>4</sub> inventory uncertainty in PWLW. The collected and processed data will be used to directly calculate CH<sub>4</sub> emission inventory as well as to validate the methane emission models.

**c. Improvement and further validation of the CH<sub>4</sub>MOD model** – This will involve the integration of CH<sub>4</sub> emission processes in PWLW into the modified CH<sub>4</sub>MOD model. The effects of N-fertilizer application and rice category and precipitation on the methane emission factor in different rice fields will also be evaluated and applied in the model. Such modification is expected to improve the utility of the model in providing advice to authorities on addressing CH<sub>4</sub> emissions from rice fields.

**d. Estimation and compilation of inventory of GHG emissions from rice paddies** – Using the information on activity data and applicable emission factors, analyses will be carried out to calculate the CH<sub>4</sub> emissions from different types of rice fields in the country in 2005. Quantitative assessment for inventory uncertainty will also be performed in line with the Tier 2 IPCC Good Practice Guidance, and the Monte Carlo statistical analysis method.

#### **Activity 1.1.3.2: Inventory of N<sub>2</sub>O emissions from croplands**

**a. Observation network on new N<sub>2</sub>O emission factors** – This will involve the estimation of N<sub>2</sub>O emission factors for croplands using a new N<sub>2</sub>-CO<sub>2</sub>-GC measurement method in multi-sites. A one year continuous parallel observations on N<sub>2</sub>O emission factors using the measurement method will be conducted. Moreover, uncertainties of N<sub>2</sub>O direct emission factors resulting from inadequate inter-annual replicates will be assessed by three-year observations in some sites. The new N<sub>2</sub>O emission factors and their uncertainties will be used for the inventory of N<sub>2</sub>O emission from Chinese croplands in 2005. Parallel to this is the correction of available N<sub>2</sub>O emission factors of croplands and re-evaluation of their uncertainties. The one-year continuous parallel observations on N<sub>2</sub>O emission in multi-sites, the difference of N<sub>2</sub>O direct emission factors that were previously established using the N<sub>2</sub>-GC measurement method will be compared to that determined by the new N<sub>2</sub>-CO<sub>2</sub>-GC method. Based on the results of the comparison, the existing N<sub>2</sub>O direct emission factors and their uncertainties will also be re-evaluated and corrected.



**b. Development and validation of process-based model** – This will involve the development of a model based on nitrogen cycling. The model will be validated using observation results in multi-sites. The model will be used to calculate N<sub>2</sub>O emission factors of croplands.

**c. Modification of the IAP-N model** – This will involve the incorporation of improved features to the IAP-N model that was developed during the INC project. It will entail the improvement of the parameters in the IAP-N model to enable it to show spatial difference, which could cause a certain degree of uncertainty of the nitrogen input with different nitrogen sources. Research work will be carried out in order to supplement data that will be used to enable replacing the original fixed parameters with spatial parameters through investigation or through calculation with process-based model. A modified version of IAP-N will be a good tool to obtain high spatial-resolution data of nitrogen input with activity data.

**d. Data collection, processing, analysis and database establishment** – All the data collected under this activity of estimating N<sub>2</sub>O emissions from croplands will be encoded in a county-level database that will be developed. Data that will be gathered will be processed and verified and encoded into the database. The database will be used in the modification of the existing IAP-N model.

**e. Estimation and compilation of inventory of GHG emissions from croplands** – Using the information on activity data and applicable emission factors, analyses will be carried out to calculate the direct and indirect N<sub>2</sub>O emissions from different types of croplands rice fields in the country in 2005. Direct N<sub>2</sub>O emission factors are from network observation results, while indirect N<sub>2</sub>O factor is set to use the default value of IPCC. The inventory will be calculated by IAP-N model. Quantitative assessment for N<sub>2</sub>O inventory uncertainty will also be performed in line with the Tier 2 IPCC Good Practice Guidance, and the Monte Carlo statistical analysis method.

#### **Activity 1.1.3.3: Inventory of CH<sub>4</sub> emissions from enteric fermentation**

**a. Data investigation/collection, and database establishment** – This will involve the quantification of activity data, such as annual average farm animal population in stock and farm animal population distribution. In order to do this, data gathering from existing agricultural statistical reports will be carried out as well through conduct of special surveys in representative agricultural areas in various counties. A survey design will be prepared for this purpose with the target respondents consisting of farmers and technicians of local livestock/husbandry bureaus/offices in the counties. Information that will be gathered in order to quantify the necessary activity data includes: animal feed type, animal feed characteristics, average daily feed intake, live weight, and milk production. All the data that will be collected will be encoded in a county-level database that will be developed. Data that will be gathered and verified will be processed, analyzed and encoded into the database. The database will be used not only for data storage but also for evaluating enteric fermentation CH<sub>4</sub> emission factors and estimation of CH<sub>4</sub> emissions from different ruminant farm animals.

**b. Evaluation of the CH<sub>4</sub> emission factors of enteric fermentation** – Based on the survey data gathered and the established activity data, the CH<sub>4</sub> emission factors of farm animal enteric fermentation will be established. Data gathered in sample counties will be analyzed and extrapolated onto regional scale. Using the information on livestock population characteristics and distribution, emission factors of each animal sub-category will be determined. The evaluation of emission factors will be supplemented by special investigations in representative agricultural farms in the different counties using special field and/or laboratory measurements and expert advice. In order to sustain this GHG inventory work, the activity data monitoring (e.g., animal population) will be integrated into the national agriculture statistical system.

**c. Conduct of field and laboratory measurements** – This will involve the measurement and development of CH<sub>4</sub> emissions factors from enteric fermentation in the field and/or in the laboratory for key farm animal categories, such as cattle. These measurement exercises are aimed at verifying and improving emission factor by measuring and analyzing the key parameters that influence CH<sub>4</sub> emissions from enteric fermentation.

**d. Estimation and compilation of inventory of GHG emissions from enteric fermentation** – Using the information on activity data (e.g., livestock population and feed characteristics) and applicable emission factors, analyses will be carried out to calculate the CH<sub>4</sub> emissions from enteric fermentation in different categories of farm animals in 2005. Quantitative assessment for N<sub>2</sub>O inventory uncertainty will also be performed in line with the Tier 2 IPCC Good Practice Guidance.

#### **Activity 1.1.3.4: Inventory of CH<sub>4</sub> and N<sub>2</sub>O emissions from animal waste management systems**

**a. Data investigation/collection, and database establishment** – This will involve the quantification of the relevant activity data, such as annual manure production, manure management system applied and ash content of manure. In order to do this, data gathering from existing agricultural statistical reports will be carried out as well through conduct of special surveys in representative agricultural areas in various counties. A survey design will be prepared for this purpose with the target respondents consisting of farmers and technicians of local livestock/husbandry bureaus/offices in the counties. Information that will be gathered in order to quantify the necessary activity data are those that relates to animal waste management, as well as data on climate parameters that affects the performance of animal waste management systems. All the data that will be collected will be encoded in a county-level database that will be developed. Data that will be gathered and verified will be processed, analyzed and encoded into the database. The database will be used not only for data storage but also for evaluating waste management system CH<sub>4</sub> and N<sub>2</sub>O emission factors and estimation of CH<sub>4</sub> and N<sub>2</sub>O emissions from such systems.

**b. Evaluation of the CH<sub>4</sub> emission factors of animal waste management systems** – Based on the survey data gathered and the established activity data, the CH<sub>4</sub> and N<sub>2</sub>O emission factors of animal

waste management systems will be established. Data gathered in sample counties will be analyzed and extrapolated onto regional scale. Using the information on livestock population characteristics and distribution, emission factors of each type of systems will be determined. The evaluation of emission factors will be supplemented by special investigations in representative agricultural farms in the different counties using special field and/or laboratory measurements and expert advice.

**c. Conduct of field and laboratory measurements** – This will involve the measurement and evaluation of CH<sub>4</sub> and N<sub>2</sub>O emission from animal waste management systems in the field and/or in the laboratory for key animal categories, such as dairy cattle farms. These measurement exercises are aimed at verifying and improving emission factor by measuring and analyzing the key parameters that influence CH<sub>4</sub> and N<sub>2</sub>O emissions from animal waste management systems.

**d. Estimation and compilation of inventory of GHG emissions from animal waste management systems** – Using the information on activity data (e.g., manure characteristics) and applicable emission factors, analyses will be carried out to calculate the CH<sub>4</sub> and N<sub>2</sub>O emissions from animal waste management systems in different categories of farm animals in 2005. Quantitative assessment for CH<sub>4</sub> and N<sub>2</sub>O inventory uncertainty will also be performed in line with the Tier 2 IPCC Good Practice Guidance.

#### **Activity 1.1.3.5: Finalization of China's 2005 GHG inventory of agricultural sector**

**a. Preparation of the draft China's 2005 GHG emission inventory of the agricultural sector** – This activity will involve the synthesis of the 4 industry sub-sector GHG emission inventories (Activities 1.1.3.1.d, 1.1.3.2.e, 1.1.3.3.d and 1.1.3.4.d). A summary of the intermediate outputs under each sub-sector inventory (e.g., test and measurement procedures, survey designs, research studies, activity data and local emission factors) will also be prepared. The draft synthesis will be used in the review of the 2005 agricultural sector GHG inventory.

**b. Conduct of the agricultural sector GHG emission inventory review** - This will involve the organization and conduct of a workshop to review the results of the data gathering activities, the findings of the research studies, the established emission factors and activity data, and the 2005 GHG emission inventory for each sub-sector. Parallel discussions for each sub-sector will be carried out during the workshop, which is expected to involve individuals and group of individuals who are experts in each sub-sector, as well as the main stakeholders in each sub-sector. The discussions on each sub-sector will involve review and comments on the data gathering methods used, primary and secondary data used, analyses done, methodologies that were developed and used, activity data that were established and the emission factors that were used and the inventory compiling methodology used. The proceedings of all discussions in each sub-sector will be fully documented. The SNC Team will also carry out one-on-one consultations and listen to the concerns and goals of the entities within each sub-sector, in view of the GHG inventory, and their proposed actions to assist in future inventories, as well as in mitigating further emissions in their respective sub-sectors in the future.

**c. Finalization of the 2005 GHG emission inventory of the agricultural sector** - This activity will involve the SNC Team finalizing the documentation of the data gathered, generated and used for the inventory. The team will finalize and document the sub-sectoral inventories, as well as the GHG inventory of the agricultural sector considering all inputs from the consultations during the review workshop. The finalized inventory will form part of China's 2005 National GHG Emissions Inventory.

#### **Output 1.1.4: GHG inventory of land use change and forestry sector**

The following are the activities that will be carried out in the inventory of GHG emissions from agricultural processes in China:

##### **Activity 1.1.4.1: Changes in forest and other woody biomass stocks**

**a. Collecting activity data of forests and other woodland areas** – This will involve the collection and updating of data (from existing statistical data reports and land use/cover maps) on forests and other woodland areas and their conversion to and from other land use categories, in all provinces, autonomous regions and municipalities in China. These data include forest area and volume stock of different age classes of major forest types (tree species), area of bamboo stands and tree crops, area and/or volume stock of trees outside forests. A database will be developed to store the updated data including data collected during the INC project as well as previous statistics and maps/images.

**b. Data analysis and accounting of carbon stock changes in forest and other woody biomass** – Using the data in the database, data on various parameters related to carbon stock such as: basic wood density, carbon fraction, biomass expansion factor (BEF), root-shoot ratio for different forest types (tree species), and biomass stock of bamboo stock and tree crops will be determined. Moreover, allometric equations for BEF will also be established, as well as the conduct supplementary survey to verify the veracity of the measured and calculated parameters.

**c. Evaluation and modeling of annual variability of forest growth** – A model that links forest growth and productivity to climatic and other environmental parameters will be developed. The following will be carried out to develop the model: (1) conduct of tree ring measurement for model validation; and, (2) collection of relevant climatic and environmental parameters. An evaluation of the annual variability of forest growth and productivity will be carried out using the developed model.

**d. Estimation and compilation of inventory of forest and other woody biomass stocks** – Using the information on activity data acquired in 1.1.4.1.a and for parameters obtained in 1.1.4.1.b, the carbon stocks in forests and other wood biomass for different forest types (tree species) and trees outside forests are calculated. The carbon stock changes are estimated in terms of annual variability

obtained in 1.1.4.1.c. Uncertainty assessments will be carried out and an inventory report on changes in forests and other woody biomass will be prepared.

#### **Activity 1.1.4.2: GHG emissions from forest conversion**

**a. Collecting activity data and database development** – This will involve the updating of the activity data that were obtained during the INC project. The same survey design will be used to gather the updated information on the various parameters that relates to area of forest conversion (deforestation). Information from relevant forestry authorities on the extent of forest conversions will be gathered. A proper database will be developed to store data gathered during the INC project as well as the updated data. The database will be used not only for data storage but also for updating the existing CO<sub>2</sub> and non-CO<sub>2</sub> emission factors for forest conversions.

**b. Evaluation of the CO<sub>2</sub> and non-CO<sub>2</sub> emission factors of forest conversions** – Based on the survey data gathered and the established activity data, the existing CO<sub>2</sub> and non-CO<sub>2</sub> emission factors of forest conversions will be updated.

**c. Estimation and compilation of GHG emissions from forest conversions** - Analyses of the extent of conversions of forests (in terms of forest cover) will be carried out to calculate the CO<sub>2</sub> and non-CO<sub>2</sub> emissions from forest conversions in 2005 using the updated emission factors in 1.1.4.2.b. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

#### **Activity 1.1.4.3: Changes in soil organic carbon**

**a. Supplemental activity data collection on croplands and grasslands** – This will involve the conduct of additional data to update and supplement the existing activity data that were gathered during the INC project. The main purpose is to enhance the analysis of the emission factors by considering other important parameters related to changes in soil organic carbon. The main activity data on grassland include the area and spatial distribution of different vegetation types, and management practices. Those on croplands include cropping systems and agricultural activities, spatial distribution of crop species and rotations, the area of uplands, rice paddies, reduced- Till and no- Till, irrigation and crop residue incorporation, and the application of lime, organic manure and synthetic fertilizer.

**b. Supplemental data collection and field measurement of parameters on soil organic carbon change** – This will involve the conduct of data collection and field measurement of parameters related to soil organic carbon change. These parameters include the stock changes of soil organic carbon (SOC) and soil respiration in different regions and cropping systems with various agricultural activities of reduced- Till and no- Till, irrigation, crop residue incorporation, applications of synthetic fertilizer and organic manure; the SOC stock changes in grassland with the activities of grazing

prohibition, grazing rotation, etc; SOC stock in different forest types, changes of SOC due to afforestation, reforestation and deforestation; release of soil carbon due to lime application. Other parameters include climate and soil properties.

**c. Database development and emission factors establishment** – The updated and supplementary data that will be collected in 1.1.4.3.a & 1.1.4.3.b will be processed and stored in a proper database that will be developed for that purpose. Literature survey and supplemental field measurements will be carried out to verify the data to ensure their reliability (and reduce uncertainties) for use in establishing emission factors. These data on the key parameters regulating changes in SOC will be used to evaluate the applicable local emission factors as substitute to the IPCC defaults.

**d. Modification and validation of the Agro-C model** – This will involve the use of the database in validating the Agro-C model that is used to simulate SOC turnover in croplands. The model will be modified accordingly to suit the independent field measurements. The modified model will be used in updating the emission factors as well as evaluating the carbon sink and/or source in croplands.

**e. Estimation and compilation of inventory of soil organic carbon** – Using the information on activity data acquired in 1.1.4.3.a and for SOC parameters obtained in 1.1.4.3.b, the soil organic carbon stocks in croplands and grasslands under different management practices, and carbon emissions induced by lime material application and deforestation will be calculated. The prescribed methodology in the IPCC guidelines will be used. Carbon sink and/or source in cropland will be evaluated by using the modified Agro-C model. Uncertainty assessments will be carried out and an inventory report on changes in forests and other woody biomass will be prepared.

#### **Activity 1.1.4.4: Finalization of China's 2005 GHG inventory of land use change and forestry (LUCF) sector**

**a. Preparation of the draft China's 2005 GHG emission inventory of the LUCF sector** – This activity will involve the synthesis of the 3 LUCF sub-sector GHG emission inventories (Activities 1.1.4.1.d, 1.1.4.2.c, and 1.1.4.3.e). A summary of the intermediate outputs under each sub-sector inventory (e.g., test and measurement procedures, survey designs, research studies, activity data and local emission factors) will also be prepared. The draft synthesis will be used in the review of the 2005 LUCF sector GHG inventory.

**b. Conduct of the LUCF sector GHG emission inventory review** - This will involve the organization and conduct of a workshop to review the results of the data gathering activities, the findings of the research studies, the established emission factors and activity data, and the 2005 GHG emission inventory for each LUCF sub-sector. Parallel discussions for each sub-sector will be carried out during the workshop, which is expected to involve individuals and group of individuals who are experts in each sub-sector, as well as the main stakeholders in each sub-sector. The discussions on each sub-sector will involve review and comments on the data gathering methods used, primary and

secondary data used, analyses done, methodologies that were developed and used, activity data that were established and the emission factors that were used and the inventory compiling methodology used. The proceedings of all discussions in each sub-sector will be fully documented. The SNC Team will also carry out one-on-one consultations and listen to the concerns and goals of the entities within each LUCF sub-sector, in view of the GHG inventory, and their proposed actions to assist in future inventories, as well as in mitigating further emissions in their respective sub-sectors in the future.

**c. Finalization of the 2005 GHG emission inventory of the LUCF sector** - This activity will involve the SNC Team finalizing the documentation of the data gathered, generated and used for the inventory. The team will finalize and document the sub-sectoral inventories, as well as the GHG inventory of the LUCF sector considering all inputs from the consultations during the review workshop. The finalized inventory will form part of China's 2005 National GHG Emissions Inventory.

### **Output 1.1.5: Inventory of GHG emissions from waste treatment**

#### **Activity 1.1.5.1: China's CH<sub>4</sub> emission inventory from waste landfills**

**a. Data collection and verification** – This will involve gathering of existing data from available reports (and if necessary purchase of data from private sector), on-site investigations, and expert consultations to obtain national and provincial historical data (1950-2004) on landfill and solid waste management system operations. These include data on the annual volumes of municipal solid waste (MSW) generation, average composition of MSW with particular focus on degradable organic content (DOC), annual volume of MSW disposed in landfills (by type and treatment process), and some quantified parameters such as oxidation factors, and methane recovery. The collected data (measured and quantified) will be verified, processed and stored in a database. In order to sustain this GHG inventory work, the data gathering exercise will be integrated into the national environment protection statistical system.

**b. Field investigations and sampling analysis in typical regions** - To supplement the data gathering work and in particular verify the data/information obtained, specific field investigations will be carried out. Typical regions or cities nationwide will be identified for the field investigations. This is for the purpose of not only acquiring first-hand information but also verify data that have already been collected. Analyses (statistical and empirical) of data gathered from the identified test areas to establish correlations of various factors/parameters that can be used for characterizing various types of MSW generated in China.

**c. Development of model for quantifying volume of municipal solid waste (MSW)** – This will involve research on the various parameters (e.g., GDP, population, etc.) that relate to MSW generation and recycling, which then will be used in developing a model for forecasting the trend of MSW generation and disposal (by type) in cities, towns and villages, taking into consideration also

the possibilities of MSW recycling. The model will estimate optimum quantities of MSW recycling and disposal. The data gathered for developing the model will also be incorporated in the database developed in 1.1.5.1.a. and will be updated as part of the national environment protection statistical system.

**d. Analysis of waste disposal in villages and towns** – This will involve the quantification of the GHG emissions from waste disposal in villages and towns for the year 2005. The emissions will be based on the data/information gathered for the annual volumes of waste generation and disposal. The future trends of MSW generation and disposal will also be determined using the model developed in 1.1.5.1.b. The GHG emissions will be calculated using the relevant activity data and emission factors based on the IPCC First Order Dynamic Method

**e. Estimation and compilation of GHG emissions from waste landfills** - Analyses of the volumes of MSW that end up in landfills (in terms of forest cover) will be carried out to calculate the CO<sub>2</sub> and non-CO<sub>2</sub> emissions from forest conversions in 2005 using the updated emission factors in 1.1.4.2.b. Quantitative assessment for inventory uncertainty will also be performed in line with the IPCC Good Practice Guidance.

#### **Activity 1.1.5.2: Inventory of CO<sub>2</sub> emissions from waste incineration treatment**

**a. Data investigation/collection, and database establishment** – This will involve the quantification of the relevant activity data such as volume of waste incinerated, waste composition and emissions from the incineration process. In order to do this, data gathering from existing statistical reports will be carried out as well through conduct of special surveys of representative waste incineration sites. A survey design will be prepared for this purpose with the target respondents consisting of operators of the site and relevant local government authorities. Information that will be gathered in order to quantify the necessary activity data are historical and present data on volume of waste incinerated, waste compositions, pollutant emissions, gas composition, chemical contents and gas capture for reuse, and CO<sub>2</sub> emissions. All the data that will be collected will be encoded in a proper database that will be developed. Data that will be gathered and verified will be processed, analyzed and encoded into the database. The database will be used not only for data storage but also for evaluating waste incineration systems CO<sub>2</sub> emission factors and estimation of CO<sub>2</sub> emissions from such systems.

**b. Evaluation of the CO<sub>2</sub> emission factors of waste incineration systems** – Based on the survey data gathered and the established activity data, the CO<sub>2</sub> emission factors of waste incineration systems will be established. Data gathered in surveyed sites (actual field measurements) will be analyzed and extrapolated onto regional scale. Using the information on incinerated waste volumes, waste composition emission factors of each type of incineration systems will be determined. The evaluation of emission factors will be supplemented by special investigations in representative waste incineration sites using special field and/or laboratory measurements and expert advice. This is aimed at verifying and improving emission factor by measuring and analyzing the key parameters that



influence CO<sub>2</sub> emissions from waste incineration systems.

**c. Estimation and compilation of inventory of GHG emissions from waste incineration systems**

– Using the information on activity data and applicable emission factors, analyses will be carried out to calculate using the prescribed IPCC methodology the CO<sub>2</sub> emissions from waste incineration systems in 2005. Quantitative assessment for CO<sub>2</sub> inventory uncertainty will also be performed in line with the Tier 2 IPCC Good Practice Guidance.

**Activity 1.1.5.3: Inventory of CH<sub>4</sub> emissions from industrial wastewater treatment**

**a. Data investigation/collection, and database establishment** – This will involve the quantification of the relevant activity data such as volume of wastewater discharge in major industries, wastewater composition and wastewater treatment process applied. In order to do this, data gathering from existing statistical reports will be carried out, as well as through conduct of special surveys of representative sites for different types of industrial wastewater treatment facilities. A survey design will be prepared for this purpose with the target respondents consisting of facility operators and relevant local government authorities. Information that will be gathered in order to quantify the necessary activity data are historical and present data on volume of industrial wastewater discharge, product output, water consumption rates, and wastewater treatment process applied, quantities of wastewater recycled/reuse, and CH<sub>4</sub> emissions. All the data that will be collected will be encoded in a proper database that will be developed. Data that will be gathered and verified will be processed, analyzed and encoded into the database. The database will be used not only for data storage but also for evaluating industrial wastewater treatment systems' CH<sub>4</sub> emission factors and estimation of CH<sub>4</sub> emissions from such systems.

**b. Measurement of the Chemical Oxygen Demand (COD) in wastewater** – This will involve actual field and/or laboratory measurement of COD of wastewater discharged in different types of industries. Typical industries that consume significant amounts of process water and discharges considerable quantities of wastewater will be selected for COD sampling analysis and measurement. The aim here is to characterize the COD content of wastewater discharged from different types of industries.

**c. Evaluation of the CH<sub>4</sub> emission factors of industrial wastewater treatment systems** – Based on the survey data gathered and the established activity data and important parameters such as COD, the CH<sub>4</sub> emission factors of industrial wastewater treatment systems will be established. Data gathered in surveyed sites (actual field measurements) will be analyzed and extrapolated onto regional scale. Using the information on industrial wastewater discharge volumes and wastewater composition, emission factors of each type of wastewater treatment systems will be determined. The evaluation of emission factors will be supplemented by special investigations in representative wastewater treatment sites using special field and/or laboratory measurements and expert advice. This is aimed at verifying and improving emission factor by measuring and analyzing the key

parameters that influence CH<sub>4</sub> emissions from industrial wastewater treatment systems.

**d. Estimation and compilation of GHG emissions inventory in wastewater treatment systems –**

Using the information on activity data and applicable emission factors, analyses will be carried out to calculate using the prescribed IPCC methodology the CH<sub>4</sub> emissions from industrial wastewater treatment systems in 2005. Quantitative assessment for CH<sub>4</sub> inventory uncertainty will also be performed in line with the Tier 2 IPCC Good Practice Guidance.

**Activity 1.1.5.4: Inventory of CH<sub>4</sub> emissions from residential wastewater treatment**

**a. Data investigation/collection, and database establishment –** This will involve the quantification of the relevant activity data such as volume of wastewater (waster and sewage) discharges in typical Chinese households, wastewater composition and wastewater treatment process applied. In order to do this, data gathering from existing statistical reports (household statistics) will be carried out, as well as through conduct of special surveys of representative residential households and city or municipal wastewater treatment facilities. A survey design will be prepared for this purpose with the target respondents consisting of household owners, operators of wastewater treatment facilities and relevant community or local government authorities. Information that will be gathered in order to quantify the necessary activity data are historical and present data on volume of sewage and wastewater discharges, household size, water consumption rates, and wastewater treatment process applied, quantities of wastewater recycled/reuse, and CH<sub>4</sub> emissions. All the data that will be collected will be encoded in a proper database that will be developed. Data that will be gathered and verified will be processed, analyzed and encoded into the database. The database will be used not only for data storage but also for evaluating residential wastewater treatment systems' CH<sub>4</sub> emission factors and estimation of CH<sub>4</sub> emissions from such systems.

**b. Measurement of the Biological Oxygen Demand (BOD) in wastewater –** This will involve actual field and/or laboratory measurement of BOD of wastewater discharged in different types of households. Typical households that consume significant amounts of process water and discharges considerable quantities of wastewater will be selected for BOD sampling analysis and measurement. The aim here is to characterize the BOD content of wastewater discharged from different types of households.

**c. Evaluation of the CH<sub>4</sub> emission factors of residential wastewater treatment systems –** Based on the survey data gathered and the established activity data and important parameters such as BOD, the CH<sub>4</sub> emission factors of residential wastewater treatment systems will be established. Data gathered in surveyed sites (actual field measurements) will be analyzed and extrapolated onto regional scale. Using the information on residential wastewater discharge volumes and wastewater composition, emission factors of each type of wastewater treatment systems will be determined. The evaluation of emission factors will be supplemented by special investigations in representative household types and wastewater treatment sites in cities/municipalities using special field and/or

laboratory measurements and expert advice. This is aimed at verifying and improving emission factor by measuring and analyzing the key parameters that influence CH<sub>4</sub> emissions from residential wastewater treatment systems.

**d. Estimation and compilation of GHG emissions inventory in wastewater treatment systems –**

Using the information on activity data and applicable emission factors, analyses will be carried out to calculate using the prescribed IPCC methodology the CH<sub>4</sub> emissions from wastewater treatment systems in 2005. Quantitative assessment for CH<sub>4</sub> inventory uncertainty will also be performed in line with the Tier 2 IPCC Good Practice Guidance.

**Activity 1.1.5.5: Inventory of N<sub>2</sub>O emissions from wastewater/sewage treatment**

**a. Measurement and analysis of N<sub>2</sub>O emission factors –** Using the data gathered (measured and/or calculated) in the measurement of wastewater COD (Activity 1.1.5.3.b) and BOD (Activity 1.1.5.4.b), the N<sub>2</sub>O emission factors for each relevant activity data will be established. The appropriate IPCC methodology for the calculation of the emission factors will be applied.

**b. Estimation and compilation of GHG emissions inventory in wastewater/sewage treatment systems –** Using the information on activity data and the N<sub>2</sub>O emission factors calculated in 1.1.5.5.a, analyses will be carried out to calculate using the prescribed IPCC methodology the N<sub>2</sub>O emissions from wastewater/sewage treatment systems in 2005. Quantitative assessment for N<sub>2</sub>O inventory uncertainty will also be performed in line with the Tier 2 IPCC Good Practice Guidance.

**Activity 1.1.5.6: Finalization of China's 2005 GHG inventory from waste treatment**

**a. Preparation of the draft China's 2005 GHG emission inventory from waste treatment –** This activity will involve the synthesis of the 5 waste treatment sub-sector GHG emission inventories (Activities 1.1.5.1.e, 1.1.5.2.c, 1.1.5.3.d, 1.1.5.4.d and 1.1.5.5.b). A summary of the intermediate outputs under each sub-sector inventory (e.g., test and measurement procedures, survey designs, research studies, activity data and local emission factors) will also be prepared. The draft synthesis will be used in the review of the 2005 waste treatment sector GHG inventory.

**b. Conduct of the waste treatment sector GHG emission inventory review -** This will involve the organization and conduct of a workshop to review the results of the data gathering activities, the findings of the research studies, the established emission factors and activity data, and the 2005 GHG emission inventory for each waste treatment sub-sector. Parallel discussions for each sub-sector will be carried out during the workshop, which is expected to involve individuals and group of individuals who are experts in each sub-sector, as well as the main stakeholders in each sub-sector. The discussions on each sub-sector will involve review and comments on the data gathering methods used, primary and secondary data used, analyses done, methodologies that were developed and used, activity data that were established and the emission factors that were used and the inventory

compiling methodology used. The proceedings of all discussions in each sub-sector will be fully documented. The SNC Team will also carry out one-on-one consultations and listen to the concerns and goals of the entities within each waste treatment sub-sector, in view of the GHG inventory, and their proposed actions to assist in future inventories, as well as in mitigating further emissions in their respective sub-sectors in the future.

**c. Finalization of the 2005 GHG emission inventory of the waste treatment sector** - This activity will involve the SNC Team finalizing the documentation of the data gathered, generated and used for the inventory. The team will finalize and document the sub-sectoral inventories, as well as the GHG inventory of the waste treatment sector considering all inputs from the consultations during the review workshop. The finalized inventory will form part of China's 2005 National GHG Emissions Inventory.

#### **Output 1.1.6: National GHG Inventory Report**

**Activity 1.1.6.1: Agreement on the outline and contents of the Report on National GHG Emission Inventory** – A workshop among the experts and people who worked in each sectoral GHG inventory will be carried out to agree on the items that need to be elaborated on and reported in the National GHG Inventory report. Clarifications and agreement will be made on the use of Table 1 and Table 2 prescribed in the Guidelines for the Development of National Communications for non-Annex I Country Parties.

**Activity 1.1.6.2: Preparation of the National GHG Inventory Report** – This will involve the consolidation of all the results of the surveys and analyses, and particularly the inventory figures from all sectoral GHG inventories. Based on the agreed outline, the sectoral write-ups (i.e., energy, industry, agriculture, waste and LUCF) will be prepared presenting the 2005 inventory data, incorporating the relevant explanations of the assumptions and methodologies used. The draft National GHG Inventory Report will be prepared.

**Activity 1.1.6.3: Consultation Workshops and finalization of the National Circumstances Report** – The draft National GHG Inventory Report will be presented in a workshop to solicit comments and recommendations from the relevant stakeholders. The pertinent comments and suggestions will be considered in the finalization of the report.

**Activity 1.2: Development of the China GHG Inventory Database** – This activity will basically involve the consolidation of the sectoral inventory databases (energy, industrial process, agriculture, land use change and forestry and wastes) that are developed in Activity 1.1. The consolidated database, i.e., China GHG Inventory Database, will serve as storage of the GHG inventories, which include information on GHG emissions quantities for each source, emission factors, activity data and other relevant information. This main database will be regularly updated, and will serve as an effective tool for the inventory compilation, inventory information analysis and management.

## **Output 1.2: China GHG emissions inventory database**

### **Activity 1.2.1: Basic framework of the China GHG inventory information management system**

– This will involve the consolidation of all databases that were prepared in the 5 sub-sectoral GHG inventories. The basic requirements for China’s GHG Inventory Information Management System framework will be identified (e.g., information sources, types and formats of input information, and deliverables). Obviously this will be in line with the requirement for the development the inventory, data structure and characteristics of 5 sub-sectoral inventories. However, the requirements for the integration of the data gathering and processing for the 5 sub-sectoral inventories into the procedures of relevant government departments that will regularly carry out the data gathering exercise for use in the sub-sectoral inventories will also be defined. With all the defined requirements, the design of the China GHG Inventory Information Management System (components/modules, input requirements and deliverables) will be carried out.

**Activity 1.2.2: Information requirements for each sub-database** – This will entail the specification of the data/information that will be required for processing and analyzing for specific inventory-related studies/researches, and for encoding in the sub-sectoral databases (i.e., energy, industrial process, agriculture, land use change and forestry and waste). The requirements for the supply and sharing of the information and the required implementing rules and regulations on the use of the GHG Inventory Information Management System will also be defined.

**Activity 1.2.3: Design of the China GHG Inventory Database** – This is mainly the design of the GHG Inventory Database, inclusive of the design of system structure, data structure, interface, data port, index and analysis functions and system maintenance. One of the main tasks is System Development wherein various kinds of system documents based on system design will be set up, as well as the development of each function module and complete information input and realizes systematic integration.

**Activity 1.2.4: Establishment of the Database** – This will involve the following specific tasks: (1) Data Processing, including the classification and standardization of the input data; (2) System Debugging, including the debugging of each function module and the whole system; (3) Routine operation, maintenance and data updating; and, (4) Training on the use and maintenance of the database.

**Activity 1.2.5: Documentation of the China GHG Inventory Database** – This will involve the preparation of the operation and maintenance manual of the database as well as the technical report on the design and development of the China GHG Inventory Database.

**Activity 1.3: Development of the China GHG Forecasting Methodology** – This major activity will cover capacity building in analyzing GHG inventory data and forecasting future GHG emissions

through the use of models. The development of the appropriate GHG emissions forecasting method is included in this activity. The methodology will include assessment of GHG emission projections based on information and inventory results available from both domestic and international sources, comparison of possible impacts of different projection methods, base data and key assumptions on the final outcomes; formulation of a set of analytical and forecast modeling tools for GHG emissions; and the presentation of GHG emission forecasting results.

### **Output 1.3: GHG Emissions Projection Methodology**

#### **Activity 1.3.1: Development of national GHG emission projection and analysis models**

**a. Development of projection and analysis models** – This will involve the design of a model for projecting and analyzing the future GHG emissions in the various sectors in China. Research will be carried out to study various methodologies used in other countries to determine their applicability in China, including where possible how such models were developed and also determining the requirements to develop and use such models. The model parameters (mainly the activity data) will be set and the effects of various parameters on the resulting emissions. Using the historical GHG emission inventory data (up to 2005), as well as the relevant activity data for each sub-sector, and using applicable statistical methods (e.g., time series analysis, forecasting) a projection model will be developed for each sub-sector. The models will be tested using data collected after 2005 to validate their accuracy.

**b. Presentation of the proposed projection and analysis models** - The projection and analysis models will be presented in a workshop to be attended by the relevant agencies that will be involved in the GHG inventories and other stakeholders (e.g., academe and research institutions). This will be for the purpose of not only introducing them but also to get comments and suggestions/inputs for improving the quality and accuracy of the performance of the models.

**c. Finalization of the model design** - The design of the models will be finalized considering the comments and incorporating the relevant suggestions/inputs from the workshop. A user manual will be prepared for each sub-sector model. The models will be endorsed for use in future GHG inventories, as well as for providing inputs for purposes of policy and decision making concerning climate change mitigation (and possibly adaptation) measures that have to be considered in the 5 major GHG-emitting sectors of the country.

#### **Activity 1.3.2: Assessment of the GHG emission projection analysis models**

**a. Forecasting GHG emission levels in 2010** – Using the models (i.e., model for each sub-sector), the projected sub-sectoral GHG emissions are determined. These will be documented, along with the data used for the various parameters that were considered, as well as the key assumptions used.

**b. Verification of 2010 GHG emission projections** – By 2011, based on collected data (activity data and for other parameters), the actual (measured and calculated) 2010 GHG emissions for each sector are compared to the projected values. A comparative analysis of the actual and projected values will be carried out to determine the reasons for the variances. An assessment report will be prepared highlighting the results of the comparative analysis. Recommendations for adjusting the models (e.g., inclusion of other parameters, deletion of non-significant parameters, adjustments in the assumptions) will be proposed and applied. This exercise will be done periodically through the succeeding national communications.

## **Component 2: Assessment on impact of, vulnerability and adaptation to climate change**

This component is intended to provide a better understanding of China's vulnerability to the threats of climate change and predicted impacts in five sectors: agriculture, water resources, coastal resources, terrestrial ecosystems and human health.

### **Output 2.1: Characteristics of climate change and analysis of future trends in China**

#### **Activity 2.1.1: Review of historical climate change and patterns in various locations in China** –

This will involve desk research and data gathering of historical climate data in different regions of China. These data (e.g., temporal and spatial distributions of surface air temperature and precipitation changes in the past century) will be analyzed to define climate & weather patterns that will be used, along with other source of information, for climate predictions in the near and long terms.

**Activity 2.1.2: Analysis of future trends of climate change** – This activity entails the establishment of future trends of climate change in China. These then will be analyzed using applicable methodologies and guidelines used in other countries, such as the MAGIC-SCENGEN tool for scenarios generation. The parameters that will be analyzed include, among others, possible trends of temperature and precipitation, as well as the corresponding changes in the frequency and intensity of climate extremes under different socio-economic assumptions.

#### **Activity 2.1.3: Preparation of report on historical and future climate change scenarios, and characteristics** –

This will involve the documentation of the results of the analysis of the historical climate change features and future climate change scenarios, including the changes in the frequency and intensity of climate extremes. The draft report will be reviewed by the relevant stakeholders (e.g., meteorological office) to solicit comments and suggestions for follow-up actions. The finalized report is published and shared with the relevant stakeholders in the various sectors affected/impacted by climate change.

## **Output 2.2: Assessments of impact of climate change on China's food production and associated vulnerability**

**Activity 2.2.1: Literature review on the assessment results related to the impact of, and vulnerability and adaptation to climate change on food production** – This will involve desk research and consultation of experts on previous and current work being done in addressing both the positive and negative impacts of climate change on the agriculture sector. The documentation of the research work will provide the appropriate baseline data in this area, including methods and tools applied to studies and researches done, measures that were proposed and implemented, as well as constraints in the implementation of such measures and how were these addressed.

**Activity 2.2.2: Assessment of climate change impacts on China's food production** – Based on data gathered in the literature review carried out in Activity 2.2.1, an assessment of the impacts of climate change on the country's food production will be carried out. Appropriate and feasible measures to minimize the negative, and maximize the positive, impacts of climate change on crop yields and food production will be identified. The associated actions such as land use change and technology improvement based on different climate change and socio-economic scenarios will be evaluated, prioritized and planned.

**Activity 2.2.3: Assessment of vulnerability and adaptation of China's agriculture to climate change** - Based on data gathered in the literature review carried out in Activity 2.2.1, a vulnerability of the country's agriculture sector will be carried out. Appropriate and feasible measures to enhance climate change resilience of the agricultural activities in the country will be identified. The associated actions including, among others, technology applications based on different climate change and socio-economic scenarios will be evaluated, prioritized and planned.

**Activity 2.2.4: Preparation of assessment report on vulnerability and adaptability to climate change of China's agricultural sector** - Two reports will be prepared and submitted to the SNC Team. One is on the vulnerability of China's agriculture sector to climate change, and the adaptation measures that can be considered. The other one is on the impacts of climate change on China's future food production. The draft reports will be reviewed by the relevant stakeholders to solicit comments and suggestions for follow-up actions. The finalized reports will be published and shared with the relevant stakeholders in the food and agriculture sectors. The reports will provide the basis for a coherent adaptation strategy of the agriculture sector addressing food security as a key priority.

## **Output 2.3: Impact assessment of climate change on water resources and its vulnerability**

**Activity 2.3.1: Literature review on impacts of climate change on China's water resource and its vulnerability and adaptation** – This will involve the assessment of the progress in the research efforts on determining and understanding the impacts of climate change to the country's water resources. The review also covers the evaluation of the research methods and tools that were



developed and/or used as well as the identified issues/concerns and the main conclusions.

**Activity 2.3.2: Impact assessment of climate change on water resources** –Based on data gathered in the literature review carried out in Activity 2.3.1, an evaluation of the observed effects of climate change on the water resources based on different climate change scenarios will be conducted. As part of the evaluation, the sensitivity of runoff to variability of precipitation and air temperature in China’s seven large river basins will be analyzed. Vulnerability assessments will be carried out in the different water resources of the country, and based on the evaluations, an index system for establishing the vulnerability of China’s water resources will be established. Hydrologic simulations will be carried out to determine the vulnerability of various water resources at different climate change scenarios. Adaptation measures for flood and drought conditions will be determined and formulated based on hydrologic simulation and in line with national economic development plans.

**Activity 2.3.3: Assessment of impacts of climate change on water supply and demand** –Based on data gathered in the literature review carried out in Activity 2.3.1, an evaluation of the potential levels of water supply available and usable under current climate change conditions in China will be conducted. The demand for water will also be evaluated under future climate change conditions and considering other factors such as population growth and socio-economic development in China.

**Activity 2.3.4: Preparation of assessment report on vulnerability and adaptability to climate change of China’s water resources** - The analysis report on the vulnerability of the water resources and the adaptation measures to address this will be prepared. The report will also include the impact assessment report of climate change on water resources supply and demand. The draft report will be reviewed by the relevant stakeholders (e.g., coastal management offices) to solicit comments and suggestions for follow-up actions. The finalized report is published and shared with the relevant stakeholders to identify opportunities and mechanisms to establish linkages between efforts to address climate change and water resources management.

#### **Output 2.4: Assessment of vulnerability to, and impacts of, climate change on forest and other natural ecosystems**

**Activity 2.4.1: Literature review of the progress of the impact of climate change on forests and other natural ecosystems** – This activity is intended for the collection of available literature on impacts of climate change on forests, grassland, glaciers, permafrost and biodiversity, as well as adaptation measures to address such impacts. The literature review includes an evaluation of the current status of the country’s capacity in carrying out vulnerability and adaptation analyses in forest areas and other natural ecosystems. The review also covers the evaluation of the research methods and tools that were developed and/or used as well as the identified issues/concerns and the main conclusions.

**Activity 2.4.2: Impact assessment of climate change on China's forests and other natural ecosystems** - Based on data gathered in the literature review carried out in Activity 2.4.1, this activity will involve the evaluation of the observed effects of climate change on forests and other natural ecosystems in China based on different climate change scenarios. The impacts of climate change on the occurrence and severity/intensity of forest fires and tree pests/diseases, and the impacts on the biodiversity in the different types of forests and other natural ecosystems in the country will be assessed.

**Activity 2.4.3: Assessment of vulnerability and adaptation of China's forests and other natural ecosystems to climate change** –Based on data gathered in the literature review carried out in Activity 2.4.1, vulnerability assessments will be carried out in the different types of forests and other natural ecosystems in the country. Based on the results of the assessments, an index system for establishing the vulnerability of China's forest and grassland ecosystems to climate change will be established, including the mapping of vulnerable forest and grassland ecosystems. Adaptation measures will be determined and formulated in line with national economic development plans. The cost effectiveness of the proposed climate change adaptation measures for forest and grassland ecosystems will be analyzed.

**Activity 2.4.4: Preparation of assessment report on vulnerability and adaptability to climate change of China's forests and grasslands** - The assessment reports on climate change impacts on forest, grassland, glacier, permafrost and biodiversity, and on vulnerability and adaptation will be compiled and consolidated. The draft report will be reviewed by the relevant stakeholders (e.g., forest management offices) to solicit comments and suggestions for follow-up actions. The finalized report is published and shared with the relevant stakeholder.

**Output 2.5: Impact assessment of climate change on sea-level rise and the coastal social economy**

**Activity 2.5.1: Literature review of relevant researches regarding the impacts of climate change on sea-level rise** - This will involve the gathering and assessment of relevant research literature and references on sea-level rise and its impact on coastal areas. It will include an analysis of biophysical and socio-economic impacts under different sea-level rise scenarios. A review and enhancement of the models and tools that were previously used for projecting China's coastal sea-level rise under different climate change scenarios will also be conducted.

**Activity 2.5.2: Impact assessment of climate change on sea-level rise and the coastal social economy** –Based on data gathered in the literature review carried out in Activity 2.5.1, the coastal areas and distribution of possible inundations in China's coastal region at different time periods and under future climate change scenarios will be assessed. Moreover, an assessment of the possible economic losses (and the resulting to the effects on socio-economic development) in coastal regions that may be affected by climate change, extreme climate events (typhoon, storm surge) and sea-level

rise will be carried out. The impacts of climate change and sea-level rise on mangrove areas and coral reefs will also be covered.

**Activity 2.5.3: Assessment of the vulnerability and adaptability of coastal area to climate change and sea-level rise** - Based on data gathered in the literature review carried out in Activity 2.5.1, vulnerability assessments will be carried out under this activity in the coastal regions of the country to determine the extent of the impacts of climate change and sea level rise. Based on the results of the evaluations, an index system for establishing the vulnerability of China's coastal areas to climate change will be established, as well as the mapping of the vulnerable coastal areas. Adaptation measures will be determined and formulated in line with socio-economic development plans in these regions. The cost effectiveness of the proposed climate change adaptation measures in coastal areas will be analyzed.

**Activity 2.5.4: Preparation of assessment report on the vulnerability and adaptability of coastal areas to climate change and sea level rise** – The assessment report on the impacts of climate change, extreme climate events and sea-level rise on the socio-economic development of coastal areas of the country will be prepared under this activity. It will include among others, the analysis report on the vulnerability of coastal areas to climate change and sea-level rise, and the distribution of vulnerable areas. The draft report will be reviewed by the relevant stakeholders (e.g., coastal zone management offices) to solicit comments and suggestions for follow-up actions. The finalized report is published and shared with the relevant stakeholder.

## **Output 2.6: Impact of climate change on human health**

**Activity 2.6.1: Review of existing research results related to climate change impacts on human health** – This will involve the collection and analysis of research reports on impact of climate change on human health in order to review the most recent findings. It will also assess the different adaptation measures that can be feasibly applied in China to address the impacts of climate change on human health.

**Activity 2.6.2: Impact assessment of climate change on human health** –Based on data gathered in the literature review carried out in Activity 2.6.1, this will involve the identification of different types of diseases that are sensitive to, or can be influenced or exacerbated by climate change. Research work will be done to determine and/or predict the most likely regions in the country where potential outbreaks of such kind of diseases can happen. This activity will involve the assessment of the impact on diseases affected by extreme events and climate change.

**Activity 2.6.3: Preparation of integrated evaluation report on impact of climate change on human health** - The preparation of the assessment report on the impacts of climate change and extreme climate events on human health will be carried out under this activity. The report will include among others, the analysis report on the vulnerability of various areas in the country to

diseases that are somehow influenced or enhanced by climate change, and the distribution of vulnerable areas. The draft report will be reviewed by the relevant stakeholders (e.g., public health offices) to solicit comments and suggestions for follow-up actions. The finalized report is published and shared with the relevant stakeholder.

### **Output 2.7: Integrated assessment report on climate change impacts, vulnerability and adaptation**

**Activity 2.7.1: Preparation of integrated impact assessment, and V&A analyses report** - The impact assessments and V&A analyses that were carried out will be compiled and consolidated into an integrated assessment report on climate change impacts, on agriculture, water resources, natural ecosystems, coastal zones and human health, and vulnerability and adaptation. A summary of the results of the impact assessments and V&A analyses for each sector, including the proposed adaptation measures will be prepared for review/discussions with policy makers.

**Activity 2.7.2: Consultation Workshops and finalization of the impact assessment and V&A analyses report** – The draft report and the summary of the results of impact assessments and V&A analyses will be presented in a stakeholders’ workshop to solicit comments and recommendations from the relevant stakeholders, focusing on high level officials from the sectors addressed in the V&A assessment studies. There will also be an agreement as to the required follow-up work that will be done and the relevant agencies/institutions that will plan and implement such policies, measures and strategies. The pertinent comments and suggestions will be considered in the finalization of the report.

**Component 3: Improving public awareness and informing policy-decision making on climate change** - This project component is intended to improve public awareness and informing policy-decision making on climate change. This will be achieved through various interventions that include: (1) the improvement and enhanced sustainability of the “China Climate Change Info-Net”; (2) compilation and dissemination of information materials on climate change; and (3) design and conduct of climate change education, training and public awareness programs.

### **Output 3.1: Sustainability of China Climate Change Info-Net**

**Activity 3.1.1: Improvement of the China Climate Change Info-Net** – This will involve the review of the performance of the Info-Net during its past 4 years of operation to identify the possible improvements needed to enhance its usefulness and sustainability. In addition, research work will be done to determine and analyze applicable good practices presented in various climate change websites including that of the UNFCCC Secretariat. Identified improvements and/or modifications to the Info-Net will be evaluated for viability and applicability. Other features will be recommended such as the addition of a platform for popular science information about climate change and the upgrading of Info-Net service functions. The Info-Net serves as the system for assisting in the

information needs of local governments in integrating climate change into their development plans and programs.

**Activity 3.1.2: Routine operation and maintenance of the China Climate Change Info-Net** - This will involve the updating and enhancement of the needed information in the website; improvement of the English version of the website; and the organization of the translation of important information. The target is to simultaneously issue both the Chinese and English versions of the website. In cooperation with PMO, the website operator will take responsibility for collecting relevant information and strengthening the publicity on the SNC. With a full- Time staff taking charge of the website, this website will be well administered and maintained.

### **Output 3.2: Compilation and dissemination of publication series on China's efforts to address climate change**

**Activity 3.2.1:** Design of a climate change awareness program – This activity will involve the development of an extensive program for promoting China's efforts in addressing climate change. It will also involve the review of the experience gained in the public awareness campaigns during the implementation of the INC project, as well as in other climate change/energy-related promotional programs in the country to learn and apply best practices. The publication series will include technical and policy materials targeting specific groups of stakeholders and institutions to enhance the effectiveness of the climate change awareness programme. Lessons learned and best practices in other countries will also be reviewed and applied/adopted where feasible. A workshop will be organized to promote the program, which will consists of information, communication and education activities that will be conducted during the project implementation period.

**Activity 3.2.2: Design and publication of promotional brochures** - This will involve the review of the experience and lessons learned from similar activities conducted during the INC project. The brochures that will be prepared will take into consideration the impacts of the brochures and other promotional printed materials after the INC project. About 2 brochures or booklets will be design and published each year during the SNC project and hopefully this activity will become a regular task of the NDRC.

### **Output 3.3: Summary report on education, training and public awareness**

**Activity 3.3.1: Agreement on the contents of the Report on education, training and public awareness** – A review of the experienced gained and lessons learned in the area “Education, Training and Public Awareness” in the INC will be carried out, along with the evaluation of the results and impacts of the activities in this area during the SNC. A stakeholders’ workshop will be carried out to agree on the items that need to be elaborated on and reported in the description of the Education, Training and Public Awareness component of the SNC Report. There will also be an agreement as to the required work that will be done and who will be doing these to prepare a comprehensive

evaluation report on Education, Training and Public Awareness on climate change in China.

**Activity 3.3.2: Evaluation of Education, Training and Public Awareness activities** – This will involve the comprehensive review of the latest developments in the country’s education policies and programs, publicity and public awareness enhancement in the area of climate change. The review will cover the analysis of present and planned government’s actions to facilitate and implement information, communication and education (ICE) activities to promote and improve public awareness on climate change issues. Moreover, major problems in the implementation of the ICE activities will also be identified and evaluated to explore appropriate approaches to raise public awareness in climate change. The evaluation is also expected to generate new data (from researches and consultations with experts) on various issues/parameters as these relate to climate change such as: current socio-economic developments, developments of major industries like the energy sector, and, strategies and goals for future developments.

**Activity 3.3.3: Preparation of the Education, Training and Public Awareness component of the SNC Report** - This will involve the rewriting of the Education, Training and Public Awareness component (Chapter) of INC Report for incorporation into the SNC Report. The chapter write-up will make use of the findings and recommendations of the evaluations that will be gathered from experts about the latest development in the country’s education policies and programs, publicity and public awareness enhancement in the area of climate change. A draft manuscript of the Chapter will be reviewed by the relevant stakeholders (e.g., NDRC, academia) to solicit comments and suggestions for follow-up actions. The finalized Chapter will also be printed as a separate report and shared with the relevant stakeholders.

**Component 4: Inventory of GHG emissions and other relevant information on climate change for Hong Kong and Macao SAR** – This project component focuses on the inventory of GHG emissions and other relevant information on climate change for the Special Administrative Regions of Hong Kong and Macao. This is the first time that the Chinese central government will include GHG emissions inventory and information on climate change of Hong Kong and Macao SARs in its national communications process.

#### **Output 4.1: GHG Inventory of Hong Kong SAR**

**Activity 4.1.1: Preparation of the Hong Kong SAR 2005 GHG inventory** - Experts will be organized to assist the relevant departments of the Hong Kong SAR in analyzing data related to GHG emissions. These data include energy consumption, industrial production, agriculture production, land use changes and forestry and municipal waste generation. The work will involve conduct of research, modeling and measurements of local emission factors for the activity data in each of the GHG-emitting sectors. Preliminary analysis will be made on the uncertainties of emission inventory.

**Activity 4.1.2: Consultation Workshops and finalization of the Hong Kong SAR 2005 GHG Inventory** - The results of the GHG emissions inventory will be presented in a stakeholders' workshop to solicit comments and recommendations from the relevant stakeholders in the Hong Kong SAR government and civil society. There will also be an agreement as to the required follow-up work that will be done and the relevant agencies/institutions that will carry them out. These include, among others, the agreed framework for the GHG emissions inventory work (e.g., institutions that will gather and/or generate the data that will be needed for the inventory; the inventory plan; and, responsibilities of all the institutions that will be involved in the inventory). The pertinent comments and suggestions will be considered in the finalization of the report. Among the workshops that will be carried out will be those that will train the stakeholders on the inventory methodologies, quantification of activity data, establishing emission factors, as well as sharing of ideas and best practices.

#### **Output 4.2: Report of information on climate change in Hong Kong SAR**

**Activity 4.2.1: Gathering, processing and assessment of climate change information on HK SAR** - With reference to the SNC Report, the outline of the climate change information report of HK SAR will be developed. On the basis of such outline, experts that will be organized will assist the HK SAR authorities in analyzing basic information on climate change that are available and that are needed for the report. A workshop will be conducted to solicit comments from stakeholders on the requirements of the report and for the stakeholders to agree on the delineation of responsibilities for the provision/production of the information required.

**Activity 4.2.2: Preparation of the report on Hong Kong SAR's climate change information –** This will involve the provision of assistance/guidance to the relevant stakeholders in Hong Kong SAR's government and civil society in preparing the report on climate change information, as per prescribed format by the UNFCCC. This activity will also involve the organization of experts that will assist in gathering, processing and evaluating the relevant information needed in the report. These include: background information (e.g., geographical/topographical, political, economic, social, etc) about the Hong Kong SAR; identified and observed impacts of climate change; policies and measures adopted to adapt to climate change; climate change mitigation policies and measures; ongoing and planned programs on scientific observation on climate system; ICE activities on climate change; funding requirements for climate change mitigation and adaptation actions; and, technology applications and capacity building. The draft report will be prepared and presented in a stakeholders' workshop to solicit comments and recommendations from the relevant stakeholders. There will also be an agreement as to the required follow-up work that will be done and the relevant agencies/institutions that will do these. The pertinent comments and suggestions will be considered in the finalization of the report.

### **Output 4.3: Macao SAR's GHG Inventory**

**Activity 4.3.1: Preparation of the Macau SAR 2005 GHG inventory** - Experts will be organized to assist the relevant departments of the Macau SAR in analyzing data related to GHG emissions. These data include energy consumption, industrial production, agriculture production, land use changes and forestry and municipal waste generation. The work will involve conduct of research, modeling and measurements of local emission factors for the identified activity data in each of the GHG-emitting sectors. Preliminary analysis will be made on the uncertainties of emission inventory.

**Activity 4.3.2: Consultation Workshops and finalization of the Macau SAR 2005 GHG Inventory** - The results of the GHG emissions inventory will be presented in a stakeholders' workshop to solicit comments and recommendations from the relevant stakeholders in the Macau SAR government and civil society. There will also be an agreement as to the required follow-up work that will be done and the relevant agencies/institutions that will carry them out. These include, among others, the agreed framework for the GHG emissions inventory work (e.g., institutions that will gather and/or generate the data that will be needed for the inventory; the inventory plan; and, responsibilities of all the institutions that will be involved in the inventory). The pertinent comments and suggestions will be considered in the finalization of the report. Among the workshops that will be carried out will be those that will train the stakeholders on the inventory methodologies, quantification of activity data, establishing emission factors, as well as sharing of ideas and best practices.

### **Output 4.4: Report of information on climate change in Macau SAR**

**Activity 4.4.1: Gathering, processing and assessment of climate change information on HK SAR** - With reference to the SNC Report, the outline of the climate change information report of HK SAR will be developed. On the basis of such outline, experts that will be organized will assist the HK SAR authorities in analyzing basic information on climate change that are available and that are needed for the report. A workshop will be conducted to solicit comments from stakeholders on the requirements of the report and for the stakeholders to agree on the delineation of responsibilities for the provision/production of the information required.

**Activity 4.4.2: Preparation of the report on Macau SAR's climate change information** – This will involve the provision of assistance/guidance to the relevant stakeholders in Macau SAR's government and civil society in preparing the report on climate change information, as per prescribed format by the UNFCCC. This activity will also involve the organization of experts that will assist gathering, processing and evaluating the relevant information needed in the report. These include: (1) Background information (e.g., geographical/topographical, political, economic, social, etc) about the Macau SAR; identified and observed impacts of climate change; policies and measures adopted to adapt to climate change; climate change mitigation policies and measures; ongoing and planned programs on scientific observation on climate system; ICE activities on climate change; funding



requirements for climate change mitigation and adaptation actions; and, technology applications and capacity building. The draft report will be prepared and presented in a stakeholders' workshop to solicit comments and recommendations from the relevant stakeholders. There will also be an agreement as to the required follow-up work that will be done and the relevant agencies/institutions that will do these. The pertinent comments and suggestions will be considered in the finalization of the report.

**Component 5: Supplementary support for achieving Convention objectives** – This project component focuses on supplementary activities that will support the implementation of the UNFCCC in China. It is expected that the outputs of the activities under this component will bring about improved capacity and technical inputs for climate change-integrated development planning both at the local and national levels.

### **Output 5.1: National circumstances**

**Activity 5.1.1: Agreement on the contents of the Report on national circumstances** – A stakeholders' workshop will be carried out to agree on the items that need to be elaborated on and reported in the description of the country's national circumstances. There will also be an agreement as to the required work that will be done and who will be doing these (e.g., researches, supplementary data gathering, etc.) to prepare a robust national circumstances report.

**Activity 5.1.2: Preparation of the National Circumstances Report** – This will involve the updating of the information on China's national circumstances in the INC Report. The report will make use of the new data that will be researched and gathered on various issues/parameters as these relate to climate change. These include, among others, current socio-economic developments, developments of major industries like the energy sector, strategies and goals for future developments.

**Activity 5.1.3: Consultation Workshops and finalization of the National Circumstances Report** – The draft report will be presented in a workshop to solicit comments and recommendations from the relevant stakeholders. The pertinent comments and suggestions will be considered in the finalization of the report.

### **Output 5.2: Formulated policies and measures for climate change mitigation**

**Activity 5.2.1: Development of climate change mitigation policies, measures and strategies** - Based on the results of the GHG emissions inventory, a study will be carried out to propose and analyze feasible mitigation measures and policies. It will conduct specific studies to assess the technology options that the country will need for application, research and development in mitigating climate change. The results of the studies (i.e., proposed climate change mitigation measures, technologies and policies as well as associated costs) will be documented in a report that will be presented to the relevant stakeholders for comments and further inputs.

**Activity 5.2.2: Agreement on the contents of the Report on climate change mitigation policies and measures** –The relevant stakeholders will be consulted for comments and recommendations on the items that need to be elaborated on and described in detail in the national climate change mitigation report (policies, measures and strategies). There will also be an agreement as to the required work that will be done and who will be doing these (e.g., studies, supplementary data gathering, etc.) to prepare a robust national climate change mitigation strategy report.

**Activity 5.2.3: Preparation of the Climate Change Mitigation Strategy Report** – The experts that will be engaged to carry out the climate change mitigation study will evaluate existing plans, policies and programs of the country on building the country into a resource-efficient and environmentally friendly society, including the aspects of industrial restructuring, sustainable economic development, and energy development to integrate with these the proposed measures, policies and strategies to for mitigating climate change. The proposed climate change mitigation measures will be based on the GHG emission inventories that were carried out in the major sectors of the country (Component 1).

**Activity 5.2.4: Consultation Workshops and finalization of the National Climate Change Mitigation Strategy Report** – The results of the study (i.e., proposed climate change mitigation measures and policies) will be presented in a stakeholders’ workshop to solicit comments and recommendations from the relevant stakeholders. There will also be an agreement as to the required follow-up work that will be done and the relevant agencies/institutions that will plan and implement such policies, measures and strategies. The pertinent comments and suggestions will be considered in the finalization of the report.

### **Output 5.3: Overview of policies and measures for climate change adaptation**

**Activity 5.3.1: Development of climate change adaptation policies, measures and strategies** - Based on the results of the impact assessments and vulnerability and adaptation assessments of the major sectors in China, a study will be carried out to propose and analyze applicable and feasible adaptation measures and policies. Part of this activity is the conduct specific studies to assess the applicable and feasible technologies that the country will need for application, research and development in adapting to the negative impacts of climate change. The results of the studies (i.e., proposed climate change adaptation measures, technologies and policies, as well as associated costs) will be documented in a report that will be presented to the relevant stakeholders for comments and further inputs.

**Activity 5.3.2: Agreement on the contents of the Report on climate change adaptation policies and measures** –The relevant stakeholders in the central and local governments as well as in the affected sectors will be consulted for comments and recommendations on the items that need to be elaborated on and described in detail in the national climate change adaptation report (policies, measures and strategies). There will also be an agreement as to the required work that will be done

and who will be doing these (e.g., studies, supplementary data gathering, etc.) to prepare a robust national climate change adaptation strategy report.

**Activity 5.3.3: Preparation of the Climate Change Adaptation Strategy Report** – The experts that will be engaged to carry out the climate change adaptation study will evaluate existing national and local social and economic development plans, policies and programs to integrate with these the proposed measures, policies and strategies for climate change adaptation. The proposed adaptation measures will be based on the impact analyses, as well as vulnerability and adaptation assessments that were carried out in the major sectors of the country (Component 2).

**Activity 5.3.4: Consultation Workshops and finalization of the National Climate Change Adaptation Strategy Report** –The results of the study (i.e., proposed climate change adaptation measures and policies) will be presented in a stakeholders’ workshop to solicit comments and recommendations from the relevant stakeholders. There will also be an agreement as to the required follow-up work that will be done and the relevant agencies/institutions that will plan and implement such policies, measures and strategies. The pertinent comments and suggestions will be considered in the finalization of the report.

#### **Output 5.4: Overview of research and systematic observation**

**Activity 5.4.1: Analysis of previous and current research work on systematic observations** – This will involve the conduct of a study to assess the progress made by the country in the area of systematic climate/weather observations. Gaps will be identified as well as recommended improvements. Based on the proposed policies on climate change mitigation and adaptation, requirements for enhancing systematic climate observation will be identified and proposed. Furthermore, a review of best practices in other countries having similar circumstances as China will also be done to learn about their best practices. The feasibility of adopting the same practices in China with the aim of providing more accurate indications of near term climate changes and variability that will help provide more scientific and reliable inputs for climate change policy and decision making.

**Activity 5.4.2: Preparation of the Status Report on Systematic Climate Observations** – This activity will, among others, involve the conduct of detailed analysis on enhancing the country’s climate observing systems, as well as the country’s cooperation in regional and global observing systems. Capacity building on needs assessment for climate observing systems and ways to establish partnerships and financing for such systems will also be carried out. The experts that will be engaged to carry out these assessments of the country’s efforts in advancing/enhancing the systematic climate observation will report on their findings and recommendations. This will include information on the latest developments in climate system observations (e.g., ground observation and remote sensing), problem detection and approaches and instruments to use to improve systematic observation and the potential collaboration with global observation systems. More importantly, the gaps and

recommendations and the follow-up plans will be included in the report.

**Activity 5.3.4: Consultation Workshop and finalization of the Systematic Climate Observation**

– The results of the study (i.e., status, gaps and recommendations) will be presented in a stakeholders’ workshop to solicit comments and recommendations from the relevant stakeholders. There will also be an agreement as to the required follow-up work that will be done and the relevant agencies/institutions that will plan and implement such policies, measures and strategies. The pertinent comments and suggestions will be considered in the finalization of the report.

**Output 5.5: Technology transfer and cooperation for the implementation of the Convention**

**Activity 5.5.1: Review of previous and current programs on technology transfer and international cooperation on climate change**

– This will involve the conduct of a study to assess the progress made by the country in the area of climate change technology transfer and cooperation. The review will also cover availability of environmentally sound technologies and extent of technical know-how and advancement in China in the area of climate change mitigation and adaptation. Gaps (as per the set policies and targets) will be identified as well as feasible recommendations for improvements. A capacity needs assessment for technology transfer and ways to establish partnerships and financing to achieve goals will also be carried out. Based on the proposed policies and plans on climate change mitigation and adaptation, requirements for technology transfer and cooperation will be identified and proposed. Furthermore, a review of best practices on the implementation of technology transfer and cooperation in other countries having similar circumstances as China will also be carried out to learn about their best practices. The feasibility of adopting the same practices in China will also be evaluated. Moreover, major barriers to technology transfer will be identified (including those from other countries) and come up with guidance for addressing them.

**Activity 5.5.2: Preparation of guidelines and plan of action on technology transfer and cooperation in China**

– Based on the results of the review that will be carried out in Activity 5.5.1, guidelines and action framework for future technology transfer and cooperation in China will be developed. An analysis of future development orientations for technology transfer and cooperation in the field of climate change in China and channels for strengthening technology transfer and cooperation will be done. The results of the analysis will be used in the preparation of the guidelines and action plan. A report on China’s technology transfer and cooperation in the area of climate change will be prepared, which will include the proposed guidelines and action plan.

**Activity 5.3.3: Consultation workshop and finalization of the technology transfer and cooperation report**

– The draft report, particularly the main components (i.e., proposed guidelines and action plan for technology transfer and cooperation) will be presented in a stakeholders’ workshop to solicit comments and recommendations from the relevant stakeholders. There will also be an agreement as to the required follow-up work that will be done and the relevant

agencies/institutions that will implement the guidelines and action plan for technology transfer and cooperation. The comments and suggestions will be considered in the finalization of the report.

## **Output 5.6: Capacity Building Activities**

**Activity 5.6.1: Assessment of capacity development need & requirements** – This involves the evaluation of the existing capacity development needs in the country in carrying out national communications work and climate change integrating activities. The identified gaps and requirements will be evaluated to come up with recommendations to address squarely the areas that need necessary capacity development. The study will also analyze the capacity-building activities that are currently being implemented at national and, where appropriate, at sub-regional and/or regional levels. The needs will be prioritized and options to address these will be identified and recommended. Also included is the analysis of the involvement of stakeholders in capacity-building, coordination and sustainability of capacity-building activities, and the dissemination and sharing of information on capacity-building activities.

**Activity 5.6.2: Conduct of special GHG inventory capacity development activities for China** – This will involve the design, organization and implementation of specific local and international training courses, workshops and study visits to enhance the capacity of the relevant government agencies and enable them to carry out effectively and efficiently the GHG emission inventories under this SNC project and in the succeeding years and national communications reporting. These include:

- GHG Emission Inventory in Energy Sector – (1) Domestic workshops and training on the methodology of energy sector GHG inventory and the methodology of quantitative uncertainties assessment suggested by *IPCC*, experience and lessons learnt during 1994 GHG emission inventory in energy sector, as well as the characteristic of energy activities of China in 2005; (2) International training or study tour for selected research personnel on activity data collection, determination of emission factors, data quality control and methodology of quantitative uncertainties assessment in order to improve the local personnel's theoretical and practical capability in the field of inventory compilation.
- GHG Emissions Inventory in Industrial Sector – (1) Domestic training seminars and workshops on the *IPCC guidelines*, good practice and relevant approaches to collect activity data and emission factors in industrial processes; (2) International training, investigation and academic exchanges activities on the management of the uncertainties of the industrial processes inventory.
- GHG Emissions Inventory in Agricultural Sector – (1) Domestic training workshop to train data collectors from typical counties, such as national and local animal experts, and governmental officers on basic information data requirement, data collection methods, quality control, methods of estimating methane emissions from enteric fermentation of livestock; (2) Overseas training or study tour in Germany and America to study advanced methodologies on

measuring emission factor, preparing the inventory, and also to study advanced methods and experiences on how to build process-based models, and validation, application and assessment of the uncertainty.

- GHG Emissions Inventory in LUCF – (1) Training course on the objectives, tasks and approaches of LUCF inventory, methods for data collection and analysis including quality assurance and quality control; (2) Local training on LUCF GHG inventory and/or soil carbon modeling specifically on guidance on data collection and measurement, inventory calculation and review report; and, (3) International training, study tour and conferences to study LUCF inventory methodology including inventory methods, application of models and tools, methods for collection and measurement of activity data and parameters, in particular techniques for measuring and modeling of soil carbon, and uncertainties assessment method.
- GHG Emissions Inventory in Waste – (1) Methodology (IPCC First-Order Dynamic Method - Tier 2) training with adaptation to country specific factors and parameters, as well as quality control, comprehensive research methodology and general objectives for the inventory preparation; (2) Workshops on GHG emissions from waste aimed at information exchange between China and other countries in the Asian region on waste-related GHG emission trends and capture/recovery for reuse, and inventory experiences; and, (3) Overseas training or study tour on GHG inventory from waste in the USA focusing on advanced methodologies on measuring emission factor, inventory preparation, advanced methods and experiences on developing process-based models, and validation, application and assessment of the uncertainty.
- GHG Emission Inventory Database – Overseas training and study tour on design and development of GHG emission inventory database.
- GHG Emissions Projection Methodology – Overseas training of experts from relevant research institutions and government departments responsible for GHG emission projection on how to select and set the organization procedures, management mechanisms and modeling methods to project national GHG emission.

Individuals who were beneficiaries of the special capacity development activities will be required to prepare and submit their recommendations in the application of what they have learned and will be required to contribute inputs to the GHG inventory activities.

**Activity 5.6.3: Preparation and presentation of the Capacity Needs Assessment Report** – The findings and recommendations of the capacity needs assessment will be documented in a report to be submitted to the SNC Team. Included in the report (as annexes) are the individual reports prepared by the capacity development trainees (particularly the international trainees and study tour participants). The report will be presented in a workshop, which will also solicit further comments and recommendations from stakeholders.

**Component 6: Publication and dissemination of the SNC Document** – This project component focuses on the completion of the formulation and documentation of China’s Second national Communications to the UNFCCC.

### **Output 6.1: Draft SNC Report**

**Activity 6.1.1: Preparation and Presentation of the SNC Report** – Based on the specific outputs of the various components of the SNC project, the SNC Report will be prepared. These would include: (1) National circumstances; (2) National GHG report; (3) Steps taken/planned to implement Convention (mitigation and adaptation); and, (4) Other relevant info on achievement of Convention objective. The report on Hong Kong SAR’s climate change information and the report on Macau SAR’s climate change information will be included in the SNC report as independent chapters. Experience gained from the INC report preparation will be considered in preparing the SNC report. The SNC Team will ensure that the report fully complies with the required information stipulated by the UNFCCC, which will present latest developments of China’s effort to fulfill its commitments as a developing country under the Convention and actions to address climate change.

**Activity 6.1.2: Review of Draft SNC Report** - The SNC Report will be reviewed by the local citizens in a participatory manner through sub-national workshops. The review will be carried out through various means such as peer reviews and sub-national workshops, which will be carried out under this SNC project, and in co-sponsored workshops, programs and events. A team of government and civil society representatives, including the private sector, will review the SNC Report. Solicitation of advice from the UNDP-GEF/NCSP will also be considered. After each consultation, the draft is revised accordingly

In addition, through the various local government entities, the draft SNC Report will be reviewed in a participatory manner through citizen/public meetings. The SNC Team will also carry out one-on-one consultations and listen to the concerns and goals of relevant groups and organizations. It will meet with key leaders of businesses, utilities, and interest groups to tie their specific needs to the SNC Report.

### **Output 6.2: Final report of the SNC in both Chinese and English**

The SNC Team will finalize the SNC Report considering all inputs from the consultations. The SNC Report will then be presented in a workshop with national and international stakeholders, and with good media coverage to provide an overall wrap up of the consensus building process. The finalized SNC Report will be submitted to and approved by concerned Ministers. The national climate change focal point will provide the UNFCCC and UNDP-GEF, copies of the SNC Report.

**Activity 6.2.1:** Organization of a workshop to discuss the draft SNC Report - This involves the conduct some exchanges and discussions among stakeholders, including representatives from government, research institutes, colleges and universities, enterprises, social organizations and non-governmental organizations, on concrete comments and inputs for improving the draft versions of the SNC.

**Activity 6.2.2:** Finalization of the SNC Report – The experts organized by the SNC Team to draft the SNC Report will revise and finalize the report considering all the relevant comments and suggestions provided by stakeholders on the draft SNC Report. The finalized SNC Report will then be officially translated in English.

**Activity 6.2.3:** Dissemination of the SNC Report – The finalized report will be distributed to national and local government agencies and target groups that are specifically impacted on by adverse effects of climate change. To ensure effective dissemination, awareness raising, and “buy in” of the local citizenry, the SNC Team will employ various strategies such as: (1) Use Public Relations and Media Events; (2) Use of Climate Change Champions; and, (3) Utilization of the Climate Change Info-Net for wider promotion. Media campaigns and awareness raising workshops will also be conducted, making use of key players and opinion leaders to convey key messages and provide a constructive enabling environment for the ultimate implementation of the proposed urgent and immediate climate change mitigation and adaptation activities

### **2.3. PROJECT INDICATORS, RISKS AND ASSUMPTIONS**

The project success indicators are shown in the Project Planning Matrix (PPM) in Section II, Part II. The target values for these indicators based on the PPM, which will be monitored during the course of this SNC project implementation, are summarized in Section IV, Part VI.

The effective implementation of this project is based on the following three assumptions. Firstly, there is a need for a capable and standing institution for project organization, which may, during the implementation period, mobilize all participants to fulfill their tasks in accordance with their respective functions. Secondly, a sustained and standing mechanism for financial support is necessary, including funding from GEF and domestic in-kind contributions, to ensure all activities concerned are carried out in an adequate and timely fashion. Thirdly, only a project team with high responsibility, efficiency and stability will be able to secure the effective process of all activities concerned. While all possible efforts have been made to ensure the effective design and implementation of the project activities in the project design phase, there are inevitably some unavoidable residual risks that will have to be carefully monitored and managed during the project to ensure its success. Among the risks that can hamper the smooth implementation of this project are: (1) potential delays in project execution; (2) drastic negative changes in international climate negotiations and (3) domestic institutional adjustments that may have negative impacts on China’s climate change response. These however are considered relatively low.



For ensuring timely implementation of project activities, NDRC and UNDP/GEF will continue working and cooperating closely with each other. Timely exchange of ideas to promote the procedure and ensure “on- Track” implementation of planned activities will be carried out.

Concerning issues on domestic institutional adjustments, the Chinese government has attached great importance to climate change issue, when declaring in a very important national policy document, the 11th Five-year Plan for National Economic and Social Development, that it will make achievements in controlling GHG emissions. A high level coordination mechanism, the NLGCC and its office, has been established, which plays very important and active role in China’s climate change related decision-making processes. In addition, the committee has promulgated Measures for Operation and Management of Clean Development Mechanism Projects in China and recently established a CDM Project Management Centre. It is clear that the Chinese government will continue to attach great importance to climate change issue and strengthen the relevant work, including further gaining its capacity through this capacity building project, and make new contribution on the protection of global climate.

#### **2.4. EXPECTED GLOBAL, NATIONAL AND LOCAL BENEFITS**

The proposed project will enable China to fulfill its obligations under the UNFCCC. It will strengthen China’s capacity to compile national communications, and further facilitate the China’s capacity building on tackling climate change. The project will assist China to make new contributions to protect global climate. The project is expected to further enhance the capacity of China’s government in integrating climate change into socio-economic development planning and policy making processes. The project will also support strategic partnerships among the participatory governmental and academic agencies on national GHG reporting, taking advantage of and strengthening the technical and managerial capacities already built in INC.

The project will also help NLGCC obtain more information and be more capable in decision-making, promoting public awareness on climate change by linking the means to combat climate change with their daily life and work, and build up the capacity of project stakeholders and players in preparing GHG emission inventories, establishing models for GHG emissions projection and analysis, as well as developing and managing database.

#### **2.5. COUNTRY OWNERSHIP: COUNTRY ELIGIBILITY AND COUNTRY DRIVENNESS**

China is a Party to the UNFCCC. On June 11, 1992, Premier Li Peng signed the UNFCCC on behalf of the Chinese Government at the UN Conference on Environment and Development in Rio de Janeiro, Brazil. On January 5, 1993, the Standing Committee of the National People’s Congress ratified the UNFCCC. As a non-Annex I Party to the UNFCCC and for the purpose of effective implementation of its commitments under the Convention, China prepared its INC in July 2001 and

officially submitted its INC during the UNFCCC's COP10 in December 2004.

China is a developing country with a huge population and relatively low level of economic development, and vulnerable to the adverse impacts of climate change. The Chinese Government attaches great importance to the issue of climate change. The Chinese Government set up the National Coordination Committee on Climate Change under the then Environmental Protection Committee of the State Council as early as 1990. In 1998 the National Coordination Committee on Climate Change was restructured and based in NDRC. Under the coordination of this Committee, the Chinese Government actively participated in international negotiations on global climate change and in the work of the IPCC, which has made great contribution to the effective implementation of China's strategy on sustainable development and to the mitigation of and adaptation to global climate change.

The proposed project will contribute to China's efforts to control GHG emissions and enhance its capacity in sustainable development. The project is in concordance with the Chinese Government's Outline of the 11th Five-Year Plan of China for National Economic and Social Development and Outline of Mid and Long- Term National Development Plan for Science and Technology. It is also noted that there is a close linkage between certain contents of the National Communication and other relevant development plans and policies of the Chinese Government, such as the *Program of Action for Sustainable Development in China in the Early 21<sup>st</sup> Century*, *Outline of the Medium and Long-Term Energy Development Program in China*, *Medium and Long-Term Special Plan on Energy Saving*, and policies regarding poverty eradication, the Grain for Green program, power supply for villages, development of circular economy and the efforts to build a resource conservation society. The project will also both benefit from, and contribute to, China's National Climate Change Program, which puts forward the guiding principles of the country in addressing climate change.

Much as the mitigation aspects are addressed, China also aims to continuously enhance its capacity to adapt to climate change. The SNC will report the information of the capacity of adaptation to climate change, new progress in climate change science and technology, improvement of public awareness in climate change and further enhancement of the development of institutions in relevant areas.

## **2.6. SUSTAINABILITY**

As in other GEF-funded projects, sustainability is an integral element of the proposed SNC project activities and is ensured through the outputs of most of the project components. The sustainability of the institutional elements of the project will be ensured through the adoption of collaborative approaches and strategies that seek to establish and improve the long- Term sustainability of existing institutional and coordination structures that have been established and are operational at both the national and regional levels. This means that the SNC will maintain strategic partnerships and agreements with the all stakeholders, taking advantage of and strengthening the technical and

managerial capacities already built.

Social sustainability will be ensured by applying learning-by-doing processes and broad but focused participation mechanisms, making stakeholders understand from the beginning the importance of the NC, what is expected from them, the use of information for their own purposes, and the mechanisms that are to be implemented to ensure their active participation.

Environmental sustainability is to be achieved through generating methodologies and information on climate change that influences decision making processes. Efforts will be focused on ongoing processes in the areas of environmental Quality, Risk Management Planning, and the Biodiversity and Desertification Conventions etc.

The capacity development activities in all aspects of the formulation of the national communications lead to a more sustainable future climate change policy making and programming for China (both at the national and local levels). A solid and official institutional framework for addressing climate change issues; and properly designed and implemented climate change mitigation and adaptation programs, which will result from this project can effectively help achieve the country's climate-considerate sustainable development objectives.

Since this SNC Project is designed with a strong capacity-building emphasis, one of the main activities will help the NDRC and the Office of NLGCC to play a significant role in the implementation of the SNC activities, and strengthen the leading and coordination capacity of these agencies in order to maintain and support project activities after project cycle and be continued in the succeeding national communications. This will also bring sustainability of the project with desired benefits in the long run.

## **2.7. REPLICABILITY**

As the formulation of national communications such as the SNC is a continuous process for a country in conjunction with meeting its obligation to the UNFCCC, the replication of the project activities and approaches are ensured. The project proposes to cover a wide range of representative national conditions and could create replicable assets including: inventory development, the methodological frameworks for V&A and mitigation assessments, participatory strategies and experiences, and activities to integrate climate change into regional and sector development processes. The efforts to develop a National GHG Inventory System, to demonstrate the benefit of incorporating Climate Change into development planning and evaluating its impacts before making investments, and indicators to evaluate the impact of NC into national policies, are tools designed to be used nationwide on a continuous basis, and as an example for other environmental issues.

Replicability of the proposed project components will be further ensured through the documentation of the package of activities/inputs that went into each components of the national communications formulation. Results from some of the activities that will be carried out, particularly under the GHG

emission inventory can be used and/or replicated by other countries in the region, especially those which have similar circumstances as China. All the information generated and collected with the SNC will be systematized, diffused and made publicly available, and become an input for national and regional policies.

### **PART III: MANAGEMENT ARRANGEMENTS**

UNDP-China will be responsible to the GEF for this proposed SNC project. The project will be executed under UNDP National Execution (NEX) procedures. NDRC will be in charge of executing this project, and provide the necessary counterpart resources in addition to the GEF funding, to support its implementation. The duration of this project is four years. The project will begin in the third quarter of 2008 and will be completed by the end of 2012.

#### **3.1. INSTITUTIONAL ARRANGEMENT**

**Project Steering Committee (PSC)** - In order to enhance the overall planning of, and guidance for the project implementation, a Project Steering Committee will be established, which will be responsible for ensuring that the project is carried out in accordance with the activities/outputs and outcomes as outlined in this project. The members of the PSC will include the Department of Resource Conservation and Environmental Protection under the NDRC, the Department of Treaty and Law of MOFA, the Department of International Cooperation of MOF, the Department of Social Development of MOST, the Department of International Cooperation of SEPA, the Department of Science and Technology of China Meteorological Administration, and UNDP Resident Coordinator in China. A Director-General from Office of NLGCC will serve as the Director of PSC.

**National Project Director (NPD)** - NDRC will appoint an official at Director-General level to serve as the National Project Director (NPD), and the NPD will be in charge of the project on behalf of NDRC. He/She will mainly be responsible for ensuring that the outputs of the project comply with what are stated in this project document; supervising the implementation process; and, ensuring that the activities are completed on time, and in coordination with other relevant government departments and stakeholders.

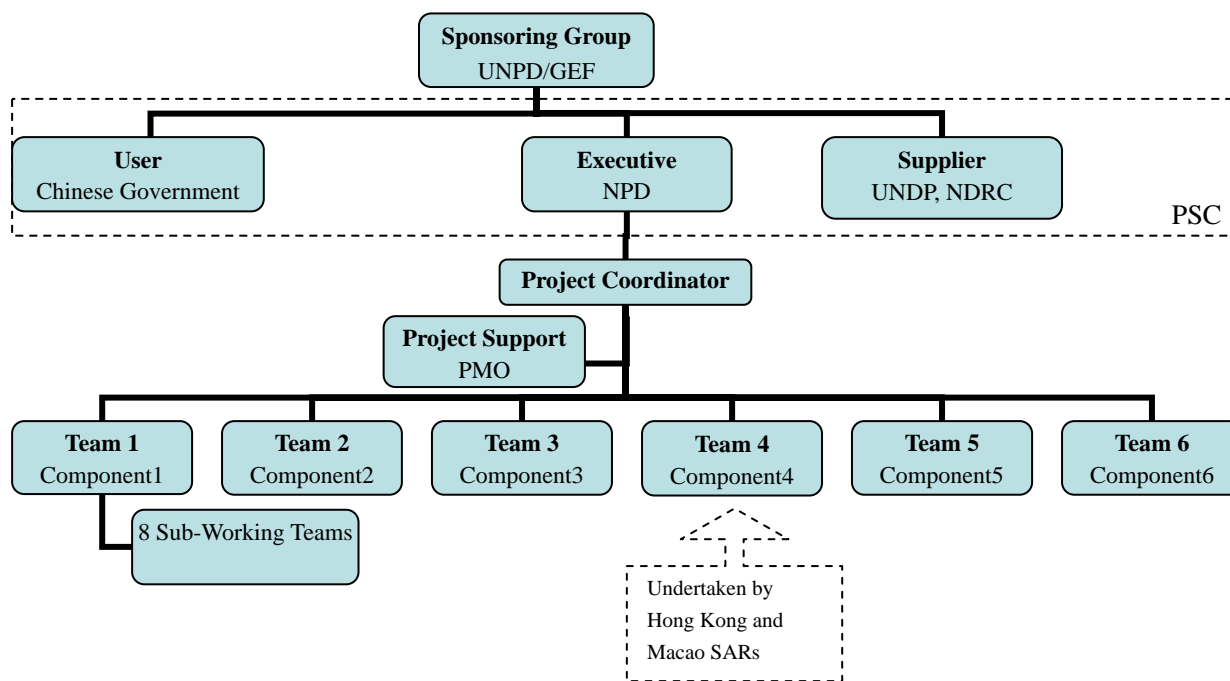
**Project Management Office (PMO)** - A PMO will be created under NDRC and will be headed by a Project Coordinator (PC). The PC will work under the direction of the PSC. He/she will assist NPD in the application of all UNDP administrative and financial procedures and the use of UNDP/GEF funds. The PC will have a small support staff (secretary/administrative assistant, etc.). The PMO will be responsible for routine project management, intensifying the communications and coordination among the institutions undertaking activities on various topics, for supervising and managing the implementation of the project together with UNDP, and for engaging in the daily management of project documents, records, files and office apparatus. It will manage the selection process for sub-contractors and recruitment of project consultants. This will include preparation of TOR, call for

bids and organization of the selection process and recruitment.

**Implementing Agency** – The implementing agency for this project is UNDP. The UNDP China country office and the UNDP-GEF Asia-Pacific Regional Coordination Unit will supervise this project independently, on behalf of the GEF. UNDP will manage the disbursement of the GEF funds for this project in a timely manner, ensuring that the required reporting of expenditure and audit of the project funds comply with national laws and regulations as well as UNDP rules and procedures.

**Support Services** – Where necessary, some of the project activities will be sub-contracted to service providers that will be evaluated and selected through a competitive bidding process in compliance with the UNDP procurement rules and requirements. The China International Center for Economic and Technical Exchanges (CICETE) is a public institution affiliated to the Ministry of Commerce. As entrusted by relevant departments of the Chinese Government, this Center is the focal point of the cooperation between China and UNDP, UNIDO and other UN organs. In line with the experience gained from implementing the Project on Enabling China to Prepare its INC, this Center will be entrusted to provide support services such as financial management, contracts and procurement of equipment, so that the management of the project complies with UNDP rules and procedures.

The diagram below shows the organizational set-up for the implementation of the proposed China SNC Project.



**Fig. 1: China SNC Project Implementation Arrangement**

### **3.2. CROSS-CUTTING COORDINATION**

The project will make full use of the existing networks with government agencies and experts in the implementation of the INC project. Such network includes government agencies, research institutes, universities, social groups, industrial sectors and NGOs, such as MOFA, MOST, MOF, SEPA, China Meteorological Administration, National Bureau of Statistics, Energy Research Institute of NDRC, Institute of Atmospheric Physics of CAS, the Research Institute of Forest Ecology, Environment and Protection of Chinese Academy of Forestry, Center of Climate Impact of Chinese Research Institute of Environmental Sciences, Institute of Environment and Sustainable Development in Agriculture of Chinese Academy of Agricultural Sciences, the Administrative Center of China's Agenda 21, Tsinghua University, Beijing Forestry University, China Iron and Steel Association, China Cement Association, State Grid Corporation, China National Petroleum Corporation, and China Economic Information Network that are involved in the Initial National Communication. Moreover, with the expanded scope of this project, consultation, collaboration and coordination will be carried out with new government departments, research institutes, social groups and NGOs, such as the Government of Hong Kong SAR, Macao SAR, Ministry of Land and Resources, China Association for Science and Technology, Global Village of Beijing, etc. The project will also engage provincial governments and their research institutes during project implementation.

This proposed enabling activity project involves close coordination with other projects and institutions that are currently planning projects/programs and/or that are relevant to the formulation of China's SNC to the UNFCCC. This includes The EU-China Energy Environment Programme (EEP), Climate Change Research sponsored by the UK's Department for Environment, Food and Rural Affairs (Defra) and the Chinese Ministry of Science and Technology (MOST) for assessing the impact of climate change on agriculture in China using advanced computer models developed in the UK. The SNC formulation will be carried out in partnership with the country's recently approved Millennium Development Goals (MDG) Programme sponsored by the UNDP/Spain MDG Achievement Fund. That program includes various activities that are relevant to the SNC project. These include conduct of studies on renewable energy development and utilization, energy efficiency applications, formulation of a new energy law, south-south cooperation and adaptation to climate change, and establishment of an International Climate Change Centre. Moreover, the SNC project will also coordinate with the recently approved SCCF Adaptation project on "Mainstreaming Adaptation to Climate Change into Water Resources Management and Rural Development", which focuses on a study of improved irrigation schemes in agriculture as a means of adapting to the impacts of climate change. Strengthening these linkages will help to ensure more focused and regular consultations with the various stakeholders of the projects both at the national and local government levels.

In order to accord proper acknowledgement to GEF for providing the funding for this project, the GEF logo will appear on all relevant project publications, including among others, any project hardware purchased with GEF funds. Any citation on publications regarding projects funded by GEF

will also accord proper acknowledgment to GEF. Where UN visibility is necessary for security purposes, the UNDP logo will be more prominent and separated from the GEF logo where possible. Logos of the IA and EA will also appear on all publications.

### **3.3. FUND FLOW ARRANGEMENTS**

UNDP and NDRC will be jointly in charge of the financial management of this project under the guidance of MOF, and China International Center for Economic and Technical Exchanges (CICETE) and/or other qualified and capable organizations will carry out the specific work relating to the implementation of the project. The project fund shall be allocated and disbursed according to the project's annual work plan. UNDP will allocate/disburse the funds on a quarterly basis in line with the annual work plan adopted in the previous year, and at the end of each November. PMO will submit the next year's annual work plan to UNDP which will allocate/disburse funds according to the received work plan.

CICETE and/or other qualified and capable organizations will, based on the financial management requirements of the Chinese Government and UNDP rules and procedures, manage the financial affairs of the project. Among others, it will allocate funds on a quarterly basis and according to UNDP conditions and procedures, prepare the quarterly financial report and revises the budgets.

## **PART IV: MONITORING AND EVALUATION PLAN AND BUDGET**

### **4.1. MONITORING AND EVALUATION**

Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures and will be provided by the project team and the UNDP China Country Office (UNDP-CO) with support from the UNDP/GEF Asia-Pacific Regional Coordination Unit (AP-RCU) in Bangkok.

UNDP will supervise the progress of this project regularly so as to find and solve problems in time and ensure the smooth implementation. The following sections outline the main components of the Monitoring and Evaluation Plan and indicative cost estimates related to M&E activities. The project's Monitoring and Evaluation Plan will be presented and finalized at the Project's Inception Workshop and documented in the Project Inception Report following a collective fine- Tuning of indicators, means of verification, and the full definition of project staff M&E responsibilities.

#### **4.1.1. Project Inception Phase**

A Project Inception Workshop will be conducted with the full project team, relevant government counterparts, co-financing partners, the UNDP-CO and representation from the UNDP-GEF AP-RCU, as well as UNDP-GEF (HQ) as appropriate.

A fundamental objective of this Inception Workshop will be to assist the project team to understand and take ownership of the project's goals and objectives, as well as finalize preparation of the project's first annual work plan on the basis of the project's log frame matrix. This will include reviewing the log frame (indicators, means of verification, assumptions), imparting additional detail as needed, and on the basis of this exercise finalize the Annual Work Plan (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project.

Additionally, the purpose and objective of the Inception Workshop (IW) will be to: (i) introduce project staff with the UNDP-GEF expanded team which will support the project during its implementation, namely the CO and responsible AP-RCU staff; (ii) detail the roles, support services and complementary responsibilities of UNDP-CO and AP-RCU staff as well as the project team; (iii) provide a detailed overview of UNDP-GEF reporting and monitoring and evaluation (M&E) requirements, with particular emphasis on the Annual Project Implementation Reviews (PIRs) and related documentation, the Annual Project Report (APR), Tripartite Review Meetings, as well as mid- Term and final evaluations. Equally, the IW will provide an opportunity to inform the project team on UNDP project related budgetary planning, budget reviews, and mandatory budget re-phasing.

The IW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and decision-making structures will be discussed again, as needed in order to clarify for all, each party's responsibilities during the project's implementation phase.

#### **4.1.2. Monitoring responsibilities and events**

A detailed schedule of project review meetings will be developed by the project management, in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Report. Such a schedule will include: (i) tentative time frames for Tripartite Reviews, Steering Committee Meetings, (or relevant advisory and/or coordination mechanisms) and (ii) project related Monitoring and Evaluation activities.

Day- To-day monitoring of implementation progress will be the responsibility of the National Project Coordinator based on the project's Annual Work Plan and its indicators. The Project Team will inform the UNDP-CO of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion.

At the Inception Workshop, the IP, UNDP-CO and UNDP-GEF AP-RCU, will fine tune the progress and performance/impact indicators of the project in consultation with the full project team. Specific



targets for the first year implementation progress indicators together with their means of verification will be developed at this Workshop. These will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the Annual Work Plan. The local implementing agencies will also take part in the Inception Workshop in which a common vision of overall project goals will be established. Targets and indicators for subsequent years would be defined annually as part of the internal evaluation and planning processes undertaken by the project team.

Periodic monitoring of implementation progress will be undertaken by the UNDP-CO through quarterly meetings with the project proponent, or more frequently if necessary. This will allow parties to take stock of and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

The UNDP CO and UNDP-GEF AP-RCU as appropriate, will conduct yearly visits to projects that have field sites, or more often based on an agreed upon schedule to be detailed in the project's Inception Report/Annual Work Plan to assess first hand project progress. Any other member of the Steering Committee can also accompany, as decided by the SC. A Field Visit Report will be prepared by the CO and circulated no less than one month after the visit to the project team, all SC members, and UNDP-GEF.

Annual monitoring will occur through the Tripartite Review (TPR). This is the highest policy-level meeting of the parties directly involved in a project's implementation. The project will be subject to Tripartite Review (TPR) at least once every year. The first such meeting will be held within the first twelve months of the start of full implementation. The project proponent will prepare an Annual Project Report (APR) and submit it to UNDP-CO and the UNDP-GEF regional office at least two weeks prior to the TPR for review and comments.

The APR will be used as one of the basic documents for discussions in the TPR meeting. The project proponent will present the APR to the TPR, highlighting policy issues and recommendations for the decision of the TPR participants. The project proponent also informs the participants of any agreement reached by stakeholders during the APR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary.

Terminal Tripartite Review (TTR) - The Terminal Tripartite Review is held in the last month of project operations. The project proponent is responsible for preparing the Terminal Report and submitting it to UNDP-CO and UNDP-GEF AP-RCU. It shall be prepared in draft at least two months in advance of the TTR in order to allow review, and will serve as the basis for discussions in the TTR. The Terminal Tripartite Review considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learned can be

captured to feed into other projects under implementation or formulation.

The TPR has the authority to suspend disbursement if project performance benchmarks are not met. Benchmarks will be developed at the Inception Workshop, based on delivery rates, and qualitative assessments of achievements of outputs.

#### **4.1.3. Project Monitoring Reporting**

The Project Coordinator in conjunction with the UNDP-GEF extended team will be responsible for the preparation and submission of the following reports that form part of the monitoring process. Items (a) through (f) are mandatory and strictly related to monitoring, while (g) through (h) have a broader function and their project specific frequency and nature will be gradually defined throughout implementation.

Inception Report (IR) - A Project Inception Report will be prepared immediately following the Inception Workshop. It will include a detailed First Year/ Annual Work Plan divided in quarterly timeframes detailing the activities and progress indicators that will guide implementation during the first year of the project. This Work Plan would include the dates of specific field visits, support missions from the UNDP-CO or the AP-RCU or consultants, as well as time-frames for meetings of the project's decision making structures. The Report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12 months timeframe.

The Inception Report will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project-related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may effect project implementation.

When finalized, the report will be circulated to project counterparts who will be given a period of one calendar month in which to respond with comments or queries. Prior to this circulation of the IR, the UNDP Country Office and UNDP-GEF AP-RCU will review the document.

Annual Project Report (APR) - The APR is a UNDP requirement and part of UNDP's Country Office central oversight, monitoring and project management. It is a self-assessment report by project management to the CO and provides input to the country office reporting process and the ROAR, as well as forming a key input to the Tripartite Project Review. An APR will be prepared on an annual basis prior to the Tripartite Project Review, to reflect progress achieved in meeting the project's Annual Work Plan and assess performance of the project in contributing to intended outcomes through outputs and partnership work.

The format of the APR is flexible but should include the following: (1) An analysis of project

performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome; (2) The constraints experienced in the progress towards results and the reasons for these; (3) The three (at most) major constraints to achievement of results; (4) AWP, CAE and other expenditure reports (ERP generated); (5) Lessons learned; and, (6) Clear recommendations for future orientation in addressing key problems that result in lack of progress

Project Implementation Review (PIR) - The PIR is an annual monitoring process mandated by the GEF. It has become an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from ongoing projects. Once the project has been under implementation for a year, a Project Implementation Report must be completed by the CO together with the project. The PIR can be prepared at any time during the year (July-June) and ideally prior to the TPR. The PIR should then be discussed in the TPR so that the result would be a PIR that has been agreed upon by the project, the executing agency, UNDP CO and the concerned Regional technical Advisor from the UNDP-GEF AP-RCU.

The annual PIRs are collected, reviewed and analyzed each year by the UNDP-GEF AP-RCU prior to sending them to the focal area clusters at the UNDP/GEF headquarters. The focal area clusters supported by the UNDP/GEF M&E Unit analyze the PIRs by focal area, theme and region for common issues/results and lessons. The TAs and PTAs play a key role in this consolidating analysis.

The focal area PIRs are then discussed in the GEF Interagency Focal Area Task Forces in or around November each year and consolidated reports by focal area are collated by the GEF Independent M&E Unit based on the Task Force findings.

The GEF M&E Unit provides the scope and content of the PIR. In light of the similarities of both APR and PIR, UNDP/GEF has prepared a harmonized format for reference.

Quarterly Progress Reports (QPRs) - Short reports outlining main updates in project progress will be provided quarterly to the local UNDP Country Office and the UNDP-GEF regional office by the project team.

Periodic Thematic Reports - As and when called for by UNDP, UNDP-GEF or the Implementing Partner, the project team will prepare Specific Thematic Reports, focusing on specific issues or areas of activity. The request for a Thematic Report will be provided to the project team in written form by UNDP and will clearly state the issue or activities for which a report is needed. These reports can be used as a form of lessons-learned exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered. UNDP is requested to minimize its requests for Thematic Reports, and when such are necessary, it will allow the project team reasonable timeframes for their preparation.

Project Terminal Report - During the last three months of the project the project team will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the Project, lessons learned, objectives met, or not achieved structures and systems implemented, etc. and will be the definitive statement of the Project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the Project's activities.

Technical Reports (*project specific - optional*) - Technical Reports are detailed documents covering specific areas of analysis or scientific specializations within the overall project. As part of the Inception Report, the project team will prepare a draft Reports List, detailing the technical reports that are expected to be prepared on key areas of activity during the course of the Project, and tentative due dates. Where necessary this Reports List will be revised and updated, and included in subsequent APRs. Technical Reports may also be prepared by external consultants and should be comprehensive, specialized analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels.

Project Publications (*project specific - optional*) - Project Publications will form a key method of crystallizing and disseminating the results and achievements of the Project. These publications may be scientific or informational texts on the activities and achievements of the Project, in the form of journal articles, multimedia publications, etc. These publications can be based on Technical Reports, depending upon the relevance, scientific worth, etc. of these Reports, or may be summaries or compilations of a series of Technical Reports and other research. The project team will determine if any of the Technical Reports merit formal publication, and will also (in consultation with UNDP, the government and other relevant stakeholder groups) plan and produce these publications in a consistent and recognizable format. Project resources will need to be identified and allocated for these activities as appropriate and in a manner commensurate with the project's budget.

#### **4.2. INDEPENDENT EVALUATION**

The project will be subjected to at least two independent external evaluations as follows:

Mid- Term Evaluation - An independent Mid- Term Evaluation will be undertaken at the end of the second year of implementation. The Mid- Term Evaluation will determine progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid- Term evaluation will be decided after consultation between the parties to the

project document. The Terms of Reference for this Mid- Term evaluation will be prepared by the UNDP CO based on guidance from the UNDP-GEF AP-RCU.

Final Evaluation - An independent Final Evaluation will take place three months prior to the terminal tripartite review meeting, and will focus on the same issues as the mid- Term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the UNDP-GEF AP-RCU.

Audit Clause - The Government will provide the UNDP Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

#### **4.3. LEARNING AND KNOWLEDGE SHARING**

Results from the project will be disseminated within and beyond the project intervention zone through a number of existing information sharing networks and forums. In addition:

- The project will participate, as relevant and appropriate, in UNDP/GEF sponsored networks, organized for Senior Personnel working on projects that share common characteristics. UNDP/GEF shall establish a number of networks. This is in order to extend the project's influence, disseminate its output, promote the exchanges with similar international projects, and enhance public awareness on climate change.
- The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation through lessons learned.
- The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Identify and analyzing lessons learned is an on-going process, and the need to communicate such lessons as one of the project's central contributions is a requirement to be delivered not less frequently than once every 12 months. UNDP/GEF shall provide a format for and assist the project team in categorizing, documenting and reporting on lessons learned. A percentage of project resources will be allocated to these activities.

#### **4.4. MONITORING AND EVALUATION BUDGET**

See Table 5 in Part V. Section IV.

## **PART V: PARTNERSHIPS STRATEGY**

The success in implementing the SNC depends on the engagement of eligible partners at all levels. The target partners include relevant domestic institutions and other international agencies located in China. Two aspects will be taken into consideration while shaping the partnership strategy for this project. The first is to enhance the coordination and implementation capacity, and the second is to give full play to the technical support capacity and services of each partner.

The key partners of the SNC are the members of NLGCC and institutions providing technical services as identified in the project components. The activities of this project will ensure that it contributes to enhancing the capacity of partners at all levels on decision-making, analysis, research and public awareness. The following are the roles of the stakeholders in the project:

<b>Organization</b>	<b>Role in the SNC Project</b>
<b>The State Council, PRC</b>	<b>Approving the final report</b>
<b>NLGCC</b>	<b>Adopting the final report, PSC member</b>
<b>NDRC</b>	<b>Project Executing Agency</b>
<b>MOFA</b>	<b>PSC member</b>
<b>MOST</b>	<b>PSC member</b>
<b>MOF</b>	<b>PSC member</b>
<b>Ministry of Land and Resources</b>	<b>Participating in the discussions of major issues</b>
<b>Ministry of Construction</b>	<b>Participating in the discussions of major issues</b>
<b>Ministry of Communications</b>	<b>Participating in the discussions of major issues</b>
<b>Ministry of Water Resources</b>	<b>Participating in the discussions of major issues</b>
<b>Ministry of Agriculture</b>	<b>Participating in the discussions of major issues</b>
<b>Ministry of Health</b>	<b>Participating in the discussions of major issues</b>
<b>SEPA</b>	<b>PSC member</b>
<b>CAAC</b>	<b>Participating in the discussions of major issues</b>
<b>National Bureau of Statistics</b>	<b>PSC member</b>
<b>State Forestry Administration</b>	<b>Participating in the discussions of major issues</b>
<b>Chinese Academy of Sciences</b>	<b>Participating in the discussions of major issues</b>
<b>China Meteorological Administration</b>	<b>PSC member</b>
<b>State Oceanic Administration</b>	<b>Participating in the discussions of major issues</b>
<b>Research institutes, colleges and universities</b>	<b>Responsible for research activities, e.g., national GHG inventory and assessment of the impact of and vulnerability to climate change</b>
<b>Social groups</b>	<b>Participating in the publicity of the project</b>
<b>Others</b>	<b>Participating in the research and publicity of the project</b>
<b>UNDP Beijing Office</b>	<b>As the Implementing Agency of GEF, carrying out overall supervision on the project on behalf of GEF</b>
<b>Supporting institutions of GEF and UNDP</b>	<b>On behalf of GEF and UNDP, providing technical guidance to the implementation of the project</b>

## **PART VI: LEGAL CONTEXT**

This project document is formulated in accordance with Chapter One of the Standard Basic Assistance Agreement signed between the Chinese Government and UNDP on 29 June 1979. To achieve the goal of the Standard Basic Assistance Agreement (SBAA), the Implementing Agency and Executing Agency should be those designated by this Agreement.

Representatives of the UNDP China may have the project document verified by the supporting agencies of GEF-UNDP project, and propose amendments in the following way, provided that other signatories to the document have no divergent views on the proposed revisions:

1. Amendment of and addition to some annexes to this document;
2. No substantial changes to the direct objectives, outputs and activities of this project, just a redistribution of the inputs or an increase in the cost due to inflation, as agreed upon by all partners.
3. Redistribution of inputs, increase of experts, increasing cost caused by inflation, or changes due to the flexibility of the institutional expenditure.
4. Only the appendix and annexes to the project documents are included.

## **SECTION II: STRATEGIC RESULT FRAMEWORK**

### **PART I: INCREMENTAL COST ANALYSIS**

Not applicable to the project.

### **PART II: LOGICAL FRAMEWORK ANALYSIS (PROJECT PLANNING MATRIX)**

For details, please refer to the logical framework analysis table - Project Planning Matrix (PPM) in Table 1.

**Table 1: Logical Framework Analysis (Project Planning Matrix)**

The project planning matrix (Log frame) was based on a participative process, which involved the Office of NLGCC (NDRC), other members of PSC, UNDP, GEF China and famous experts. A series of workshops and working seminars were held to agree on the project objectives, outputs and activities, etc.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
<b>Goal:</b> Formulation & submission of SNC Report	SNC Report	INC Report	Formulated and submitted SNC Report	SNC Report submitted to the UNFCCC	
<b>Objective:</b> Strengthened capacity to integrate climate change concerns into national and sectoral development priorities while fulfilling obligations to the UNFCCC	Level of technical and institutional capacity on NC formulation	Existing capacity with INC is not sufficient to the new NC formulation requirements	Strengthened capacity to enable China integrate climate change concerns & issues into national & sectoral development priorities through the SNC process	Operational CC framework at the central and local government levels	
<b>COMPONENT 1: Inventory of GHG Emissions, Development of GHG Inventory Database and Forecasting &amp; Modeling Systems</b>					
Output 1.1.2.1: Inventory of GHG emissions from fossil fuel combustion	<ul style="list-style-type: none"> <li>● Activity data for fossil fuel combustion</li> <li>● CO<sub>2</sub> emission factors for fossil fuel combustion</li> <li>● CO<sub>2</sub> emissions for fossil fuel combustion</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for fossil fuel combustion in INC</li> <li>● CO<sub>2</sub> emission factors for fossil fuel combustion used in INC</li> <li>● CO<sub>2</sub> emissions from fossil fuel combustion as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for fossil fuel combustion by Quarter 2;</li> <li>● Improved emission factors for fossil fuel combustion by Quarter 6</li> <li>● Completed inventory of CO<sub>2</sub></li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 CO<sub>2</sub> emissions inventory from fossil fuel combustion.</li> </ul>	National Bureau of Statistics and relevant entities in the coal, oil, and natural gas & electricity sectors fully cooperate in the provision of data fossil fuel consumption



Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
			emissions from fossil fuel combustion by Quarter 9.		
Output 1.1.2.2: Inventory of GHG emissions from biomass energy combustion	<ul style="list-style-type: none"> <li>● Activity data for biomass energy combustion</li> <li>● CH<sub>4</sub> &amp; N<sub>2</sub>O emission factors for biomass energy combustion</li> <li>● CH<sub>4</sub> &amp; N<sub>2</sub>O emissions for biomass energy combustion</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for biomass energy combustion in INC</li> <li>● CH<sub>4</sub> &amp; N<sub>2</sub>O emission factors for biomass energy combustion used in INC</li> <li>● CH<sub>4</sub> &amp; N<sub>2</sub>O emissions from biomass energy combustion as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for biomass energy combustion by Quarter 2;</li> <li>● Improved emission factors for biomass energy combustion by Quarter 6</li> <li>● Completed inventory of CH<sub>4</sub> &amp; N<sub>2</sub>O emissions from biomass energy combustion by Quarter 9.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 CH<sub>4</sub> &amp; N<sub>2</sub>O emissions inventory from biomass energy combustion.</li> </ul>	National Bureau of Statistics and relevant entities in the agriculture and biomass-using companies fully cooperate in the provision of data on biomass energy consumption.
Output 1.1.2.3: Inventory of GHG emissions from coal mining & post mining activities	<ul style="list-style-type: none"> <li>● Activity data for coal mining &amp; post mining activities</li> <li>● CH<sub>4</sub> emission factors for coal mining &amp; post mining activities</li> <li>● CH<sub>4</sub> emissions for coal mining &amp; post mining activities</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for coal mining &amp; post mining activities in INC</li> <li>● CH<sub>4</sub> emission factors for coal mining &amp; post mining activities used in INC</li> <li>● CH<sub>4</sub> emissions from coal mining &amp; post mining activities as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for coal mining &amp; post mining activities by Quarter 2;</li> <li>● Improved emission factors for coal mining &amp; post mining activities by Quarter 6</li> <li>● Completed inventory of CH<sub>4</sub> emissions from coal mining</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 CH<sub>4</sub> emissions inventory from coal mining &amp; post mining activities.</li> </ul>	National Bureau of Statistics and relevant entities in the coal sector fully cooperate in the provision of data for use in the inventory.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
			& post mining activities by Quarter 9.		
Output 1.1.2.4: Inventory of fugitive GHG emissions from oil & gas systems	<ul style="list-style-type: none"> <li>● Activity data for oil &amp; gas systems</li> <li>● CH<sub>4</sub> emission factors for oil &amp; gas systems</li> <li>● Fugitive CH<sub>4</sub> emissions for oil &amp; gas systems</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for oil &amp; gas systems in INC</li> <li>● CH<sub>4</sub> emission factors for oil &amp; gas systems used in INC</li> <li>● Fugitive CH<sub>4</sub> emissions from oil &amp; gas systems as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for oil &amp; gas systems by Quarter 2;</li> <li>● Improved emission factors for oil &amp; gas systems by Quarter 6</li> <li>● Completed inventory of fugitive CH<sub>4</sub> emissions from oil &amp; gas systems by Quarter 9.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 fugitive CH<sub>4</sub> emissions inventory from oil &amp; gas systems.</li> </ul>	National Bureau of Statistics and relevant entities in the oil & gas sector fully cooperate in the provision of data for use in the inventory.
Output 1.1.1.5: Summary analysis and China's GHG inventory of the energy sector	<ul style="list-style-type: none"> <li>● The 2005 GHG inventory from energy activities in China</li> </ul>	<ul style="list-style-type: none"> <li>● Summary of GHG emissions inventory in the INC Report</li> </ul>	<ul style="list-style-type: none"> <li>● Summary of the 2005 GHG emissions inventory in the energy sector in China by Quarter 12.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed summary document of the 2005 GHG emission inventory in the energy sector</li> </ul>	
Output 1.1.2.1: Inventory of GHG emissions in cement production	<ul style="list-style-type: none"> <li>● Activity data for cement production</li> <li>● CO<sub>2</sub> emission factors in cement production</li> <li>● CO<sub>2</sub> emissions from cement production</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for cement production in INC</li> <li>● CO<sub>2</sub> emission factors in cement production used in INC</li> <li>● CO<sub>2</sub> emissions from cement production as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for cement production by Quarter 2;</li> <li>● Improved emission factors for cement production by Quarter 6</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 CO<sub>2</sub> emissions inventory in cement production.</li> </ul>	Cement plants cooperate in the provision of data required in the surveys.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
			<ul style="list-style-type: none"> <li>Completed inventory of CO<sub>2</sub> emissions from cement production by Quarter 9.</li> </ul>		
Output 1.1.2.2: Inventory of GHG emissions in lime production	<ul style="list-style-type: none"> <li>Activity data for lime production</li> <li>CO<sub>2</sub> emission factors in lime production</li> <li>CO<sub>2</sub> emissions from lime production</li> </ul>	<ul style="list-style-type: none"> <li>Activity data for lime production in INC</li> <li>CO<sub>2</sub> emission factors in lime production used in INC</li> <li>CO<sub>2</sub> emissions from lime production as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>Improved activity data collection and quantification methods, and completed activity data for lime production by Quarter 2;</li> <li>Improved emission factors for lime production by Quarter 6</li> <li>Completed inventory of CO<sub>2</sub> emissions from lime production by Quarter 9.</li> </ul>	<ul style="list-style-type: none"> <li>Completed 2005 CO<sub>2</sub> emissions inventory in lime production.</li> </ul>	Lime plants cooperate in the provision of data required in the surveys.
Output 1.1.2.3: Inventory of GHG emissions in iron & steel production	<ul style="list-style-type: none"> <li>Activity data for iron &amp; steel production</li> <li>CO<sub>2</sub> emission factors in iron &amp; steel production</li> <li>CO<sub>2</sub> emissions from iron &amp; steel production</li> </ul>	<ul style="list-style-type: none"> <li>Activity data for iron &amp; steel production in INC</li> <li>CO<sub>2</sub> emission factors in iron &amp; steel production used in INC</li> <li>CO<sub>2</sub> emissions from iron &amp; steel production as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>Improved activity data collection and quantification methods, and completed activity data for iron &amp; steel production by Quarter 2;</li> <li>Improved emission factors for iron &amp; steel production by Quarter 6</li> <li>Completed inventory of CO<sub>2</sub> emissions from iron &amp; steel production by Quarter 9.</li> </ul>	<ul style="list-style-type: none"> <li>Completed 2005 CO<sub>2</sub> emissions inventory in iron &amp; steel production.</li> </ul>	Iron & steel plants cooperate in the provision of data required in the surveys.
Output 1.1.2.4: Inventory of GHG	<ul style="list-style-type: none"> <li>Activity data for calcium carbide</li> </ul>	<ul style="list-style-type: none"> <li>Activity data for calcium carbide production in</li> </ul>	<ul style="list-style-type: none"> <li>Improved activity data collection and quantification</li> </ul>	<ul style="list-style-type: none"> <li>Completed 2005 CO<sub>2</sub> emissions inventory in</li> </ul>	Calcium carbide plants cooperate in the provision

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
emissions in calcium carbide production	<ul style="list-style-type: none"> <li>production</li> <li>● CO<sub>2</sub> emission factors in calcium carbide production</li> <li>● CO<sub>2</sub> emissions from calcium carbide production</li> </ul>	INC <ul style="list-style-type: none"> <li>● CO<sub>2</sub> emission factors in calcium carbide production used in INC</li> <li>● CO<sub>2</sub> emissions from calcium carbide production as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>methods, and completed activity data for calcium carbide production by Quarter 2;</li> <li>● Improved emission factors for calcium carbide production by Quarter 6</li> <li>● Completed inventory of CO<sub>2</sub> emissions from calcium carbide production by Quarter 9.</li> </ul>	calcium carbide production.	of data required in the surveys.
Output 1.1.2.5: Inventory of GHG emissions in adipic acid production	<ul style="list-style-type: none"> <li>● Activity data for adipic acid production</li> <li>● N<sub>2</sub>O emission factors in adipic acid production</li> <li>● N<sub>2</sub>O emissions from adipic acid production</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for adipic acid production in INC</li> <li>● N<sub>2</sub>O emission factors in adipic acid production used in INC</li> <li>● N<sub>2</sub>O emissions from adipic acid production as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for adipic acid production by Quarter 2;</li> <li>● Improved emission factors for adipic acid production by Quarter 6</li> <li>● Completed inventory of N<sub>2</sub>O emissions from adipic acid production by Quarter 9.</li> </ul>	● Completed 2005 N <sub>2</sub> O emissions inventory in adipic acid production.	Adipic acid plants cooperate in the provision of data required in the surveys.
Output 1.1.2.6: Inventory of GHG emissions in nitric acid production	<ul style="list-style-type: none"> <li>● Activity data for nitric acid production</li> <li>● N<sub>2</sub>O emission factors in nitric acid production</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for nitric acid production in INC</li> <li>● N<sub>2</sub>O emission factors in nitric acid production used in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for nitric acid production by Quarter 2;</li> </ul>	● Completed 2005 N <sub>2</sub> O emissions inventory in nitric acid production.	Nitric acid plants cooperate in the provision of data required in the surveys.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
	<ul style="list-style-type: none"> <li>● N<sub>2</sub>O emissions from nitric acid production</li> </ul>	<ul style="list-style-type: none"> <li>● N<sub>2</sub>O emissions from nitric acid production as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved emission factors for nitric acid production by Quarter 6</li> <li>● Completed inventory of N<sub>2</sub>O emissions from nitric acid production by Quarter 9.</li> </ul>		
Output 1.1.2.7: Inventory of GHG emissions in aluminum production	<ul style="list-style-type: none"> <li>● Activity data for aluminum production</li> <li>● PFC emission factors in aluminum production</li> <li>● PFC emissions from aluminum production</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for aluminum production in INC</li> <li>● PFC emission factors in aluminum production used in INC</li> <li>● PFC emissions from aluminum production as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for aluminum production by Quarter 2;</li> <li>● Improved emission factors for aluminum production by Quarter 6</li> <li>● Completed inventory of PFC emissions from aluminum production by Quarter 9.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 PFC emissions inventory in aluminum production.</li> </ul>	Aluminum plants cooperate in the provision of data required in the surveys.
Output 1.1.2.8: Inventory of GHG emissions in magnesium production	<ul style="list-style-type: none"> <li>● Activity data for magnesium production</li> <li>● SF<sub>6</sub> emission factors in magnesium production</li> <li>● SF<sub>6</sub> emissions from magnesium production</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for magnesium production in INC</li> <li>● SF<sub>6</sub> emission factors in magnesium production used in INC</li> <li>● SF<sub>6</sub> emissions from magnesium production as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for magnesium production by Quarter 2;</li> <li>● Improved emission factors for magnesium production by Quarter 6</li> <li>● Completed inventory of SF<sub>6</sub> emissions from magnesium</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 SF<sub>6</sub> emissions inventory in magnesium production.</li> </ul>	Magnesium plants cooperate in the provision of data required in the surveys.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
			production by Quarter 9.		
Output 1.1.2.9: Inventory of GHG emissions in electrical equipment production	<ul style="list-style-type: none"> <li>● Activity data for electrical equipment production</li> <li>● SF<sub>6</sub> emission factors in electrical equipment production</li> <li>● SF<sub>6</sub> emissions from electrical equipment production</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for electrical equipment production in INC</li> <li>● SF<sub>6</sub> emission factors in electrical equipment production used in INC</li> <li>● SF<sub>6</sub> emissions from electrical equipment production as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for electrical equipment production by Quarter 2;</li> <li>● Improved emission factors for electrical equipment production by Quarter 6</li> <li>● Completed inventory of SF<sub>6</sub> emissions from electrical equipment production by Quarter 9.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 SF<sub>6</sub> emissions inventory in electrical equipment production.</li> </ul>	Electrical equipment plants cooperate in the provision of data required in the surveys.
Output 1.1.2.10: Inventory of GHG emissions in semiconductors production	<ul style="list-style-type: none"> <li>● Activity data for semiconductors production</li> <li>● SF<sub>6</sub>, PFC &amp; HFC emission factors in semiconductors production</li> <li>● SF<sub>6</sub>, PFC &amp; HFC emissions from semiconductors production</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for semiconductors production in INC</li> <li>● SF<sub>6</sub>, PFC &amp; HFC emission factors in semiconductors production used in INC</li> <li>● SF<sub>6</sub>, PFC &amp; HFC emissions from semiconductors production as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for semiconductors production by Quarter 2;</li> <li>● Improved emission factors for semiconductors production by Quarter 6</li> <li>● Completed inventory of SF<sub>6</sub>, PFC &amp; HFC emissions from semiconductors production by Quarter 9.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 SF<sub>6</sub>, PFC &amp; HFC emissions inventory in semiconductors production.</li> </ul>	Semiconductors plants cooperate in the provision of data required in the surveys.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
Output 1.1.2.10: Inventory of GHG emissions in ODS production	<ul style="list-style-type: none"> <li>● Activity data for semiconductors production</li> <li>● PFC &amp; HFC emission factors in ODS production</li> <li>● PFC &amp; HFC emissions from ODS production</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for ODS production in INC</li> <li>● PFC &amp; HFC emission factors in ODS production used in INC</li> <li>● PFC &amp; HFC emissions from ODS production as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for ODS production by Quarter 2;</li> <li>● Improved emission factors for ODS production by Quarter 6</li> <li>● Completed inventory of PFC &amp; HFC emissions from ODS production by Quarter 9.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 PFC &amp; HFC emissions inventory in ODS production.</li> </ul>	<p>ODS plants cooperate in the provision of data required in the surveys.</p>
Output 1.1.2.12: Summary analysis and China's GHG inventory of the industry sector	<ul style="list-style-type: none"> <li>● The 2005 GHG inventory from industry activities in China</li> </ul>	<ul style="list-style-type: none"> <li>● Summary of GHG emissions inventory in the industry sector in the INC Report</li> </ul>	<ul style="list-style-type: none"> <li>● Summary of the 2005 GHG emissions inventory in the industry sector in China by Quarter 12.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed summary document of the 2005 GHG emission inventory in the industry sector</li> </ul>	
Output 1.1.3.1: Inventory of GHG emissions in rice paddies	<ul style="list-style-type: none"> <li>● Activity data for rice paddies</li> <li>● CH<sub>4</sub> emission factors in rice paddies</li> <li>● CH<sub>4</sub> emissions from rice paddies</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for rice paddies in INC</li> <li>● CH<sub>4</sub> emission factors in rice paddies in INC</li> <li>● CH<sub>4</sub> emissions from rice paddies as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for rice paddies by Quarter 4;</li> <li>● Improved emission factors for rice paddies by Quarter 9</li> <li>● Completed inventory of CH<sub>4</sub> emissions from rice paddies Quarter 13.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 CH<sub>4</sub> emissions inventory in rice paddies</li> </ul>	<p>Survey respondents fully cooperate in the provision of data required in the surveys.</p>
Output 1.1.3.2:	<ul style="list-style-type: none"> <li>● Activity data for</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 N<sub>2</sub>O</li> </ul>	<p>Survey respondents fully</p>

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
Inventory of GHG emissions in croplands	<ul style="list-style-type: none"> <li>croplands</li> <li>● N<sub>2</sub>O emission factors in croplands</li> <li>● N<sub>2</sub>O emissions from croplands</li> </ul>	<ul style="list-style-type: none"> <li>croplands in INC</li> <li>● N<sub>2</sub>O emission factors in croplands used in INC</li> <li>● N<sub>2</sub>O emissions from croplands as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>collection and quantification methods, and completed activity data for croplands by Quarter 4;</li> <li>● Improved emission factors for croplands by Quarter 9</li> <li>● Completed inventory of N<sub>2</sub>O emissions from croplands by Quarter 13.</li> </ul>	emissions inventory in croplands	cooperate in the provision of data required in the surveys.
Output 1.1.3.3: Inventory of GHG emissions from enteric fermentation	<ul style="list-style-type: none"> <li>● Activity data for enteric fermentation</li> <li>● CH<sub>4</sub> emission factors for enteric fermentation</li> <li>● CH<sub>4</sub> emissions from enteric fermentation</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for enteric fermentation in INC</li> <li>● CH<sub>4</sub> emission factors for enteric fermentation used in INC</li> <li>● CH<sub>4</sub> emissions from enteric fermentation as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for enteric fermentation by Quarter 4;</li> <li>● Improved emission factors for enteric fermentation by Quarter 9</li> <li>● Completed inventory of CH<sub>4</sub> emissions from enteric fermentation by Quarter 13.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 CH<sub>4</sub> emissions inventory from enteric fermentation</li> </ul>	Survey respondents fully cooperate in the provision of data required in the surveys.
Output 1.1.3.4: Inventory of GHG emissions in animal waste management systems	<ul style="list-style-type: none"> <li>● Activity data for animal waste management systems</li> <li>● CH<sub>4</sub> &amp; N<sub>2</sub>O emission factors in animal waste management systems</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for animal waste management systems in INC</li> <li>● CH<sub>4</sub> &amp; N<sub>2</sub>O emission factors in animal waste management systems used in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for animal waste management systems by Quarter 4;</li> <li>● Improved emission factors</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 CH<sub>4</sub> &amp; N<sub>2</sub>O emissions inventory in animal waste management systems.</li> </ul>	Calcium carbide plants cooperate in the provision of data required in the surveys.



Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
	<ul style="list-style-type: none"> <li>● CH<sub>4</sub> &amp; N<sub>2</sub>O emissions from animal waste management systems</li> </ul>	<ul style="list-style-type: none"> <li>● CH<sub>4</sub> &amp; N<sub>2</sub>O emissions from animal waste management systems as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>for animal waste management systems by Quarter 9</li> <li>● Completed inventory of CH<sub>4</sub> &amp; N<sub>2</sub>O emissions from animal waste management systems by Quarter 13.</li> </ul>		
Output 1.1.3.5: Summary analysis and China's GHG inventory of the agriculture sector	The 2005 GHG inventory from agriculture activities in China	Summary of GHG emissions inventory in the agriculture sector in the INC Report	Summary of the 2005 GHG emissions inventory in the agriculture sector in China by Quarter 13.	Completed summary document of the 2005 GHG emission inventory in the agriculture sector	
Output 1.1.4.1: Inventory of carbon stocks in forests and other woody biomass	<ul style="list-style-type: none"> <li>● Activity data for forests and other woody biomass</li> <li>● Carbon stock from forest and other woody biomass</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for forest and other woody biomass in INC</li> <li>● Carbon stock from forest and other woody biomass as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for forest and other woody biomass by Quarter 7;</li> <li>● Completed inventory of carbon stocks from forest and other woody biomass by Quarter 13.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 carbon stocks inventory in forest and other woody biomass.</li> </ul>	Relevant government agencies fully cooperate in the provision of data required in the inventory.
Output 1.1.4.2: Inventory of GHG emissions from forest conversions	<ul style="list-style-type: none"> <li>● Activity data for forest conversions</li> <li>● CO<sub>2</sub> &amp; non-CO<sub>2</sub> emission factors in forest conversions</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for forest conversions in INC</li> <li>● CO<sub>2</sub> &amp; non-CO<sub>2</sub> emission factors in forest conversions used in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for forest conversions by Quarter 4;</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 CO<sub>2</sub> &amp; non-CO<sub>2</sub> emissions inventory in forest conversions.</li> </ul>	Relevant government agencies fully cooperate in the provision of data required in the inventory.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
	<ul style="list-style-type: none"> <li>● CO<sub>2</sub> &amp; non-CO<sub>2</sub> emissions from forest conversions</li> </ul>	<ul style="list-style-type: none"> <li>● CO<sub>2</sub> &amp; non-CO<sub>2</sub> emissions from forest conversions as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved emission factors for forest conversions by Quarter 8</li> <li>● Completed inventory of CO<sub>2</sub> &amp; non-CO<sub>2</sub> emissions from forest conversions by Quarter 12.</li> </ul>		
Output 1.1.4.3: Inventory of changes in soil organic carbon	<ul style="list-style-type: none"> <li>● Activity data for changes in soil organic carbon</li> <li>● Carbon stock in the form of soil organic carbon</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for soil organic carbon in INC</li> <li>● Carbon stock in the form of soil organic carbon as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for soil organic carbon by Quarter 7;</li> <li>● Completed inventory of changes in soil organic carbon by Quarter 12.</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 inventory of changes in soil organic carbon.</li> </ul>	Relevant government agencies fully cooperate in the provision of data required in the inventory.
Output 1.1.4.4: Summary analysis and China's GHG inventory of the LUCF sector	The 2005 GHG inventory from LUCF sector in China	Summary of GHG emissions inventory in the LUCF sector in the INC Report	Summary of the 2005 GHG emissions inventory in the LUCF sector in China by Quarter 13.	Completed summary document of the 2005 GHG emission inventory in the LUCF sector	
Output 1.1.5.1: Inventory of CO <sub>2</sub> emissions in waste landfills	<ul style="list-style-type: none"> <li>● Activity data for waste landfills</li> <li>● CO<sub>2</sub> emission factors in waste landfills</li> <li>● CO<sub>2</sub> emissions from waste landfills</li> </ul>	<ul style="list-style-type: none"> <li>● Activity data for waste landfills in INC</li> <li>● CO<sub>2</sub> emission factors in waste landfills used in INC</li> <li>● CO<sub>2</sub> emissions from waste landfills as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>● Improved activity data collection and quantification methods, and completed activity data for waste landfills by Quarter 4;</li> <li>● Improved emission factors for waste landfills by Quarter 8</li> </ul>	<ul style="list-style-type: none"> <li>● Completed 2005 CO<sub>2</sub> emissions inventory in waste landfills.</li> </ul>	Relevant government agencies fully cooperate in the provision of data required in the inventory.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
			<ul style="list-style-type: none"> <li>Completed inventory of CO<sub>2</sub> emissions from waste landfills by Quarter 12.</li> </ul>		
Output 1.1.5.2: Inventory of CO <sub>2</sub> emissions in waste incineration treatment	<ul style="list-style-type: none"> <li>Activity data for waste incineration treatment</li> <li>CO<sub>2</sub> emission factors in waste incineration treatment</li> <li>CO<sub>2</sub> emissions from waste incineration treatment</li> </ul>	<ul style="list-style-type: none"> <li>Activity data for waste incineration treatment in INC</li> <li>CO<sub>2</sub> emission factors in waste incineration treatment used in INC</li> <li>CO<sub>2</sub> emissions from waste incineration treatment as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>Improved activity data collection and quantification methods, and completed activity data for waste incineration treatment by Quarter 4;</li> <li>Improved CO<sub>2</sub> emission factors for waste incineration treatment by Quarter 8</li> <li>Completed inventory of CO<sub>2</sub> emissions from waste incineration treatment by Quarter 12.</li> </ul>	<ul style="list-style-type: none"> <li>Completed 2005 CO<sub>2</sub> emissions inventory in waste incineration treatment.</li> </ul>	Relevant government agencies fully cooperate in the provision of data required in the inventory.
Output 1.1.5.3: Inventory of CH <sub>4</sub> emissions in industrial wastewater treatment	<ul style="list-style-type: none"> <li>Activity data for industrial wastewater treatment</li> <li>CH<sub>4</sub> emission factors in industrial wastewater treatment</li> <li>CH<sub>4</sub> emissions from industrial wastewater treatment</li> </ul>	<ul style="list-style-type: none"> <li>Activity data for industrial wastewater treatment in INC</li> <li>CH<sub>4</sub> emission factors in industrial wastewater treatment used in INC</li> <li>CH<sub>4</sub> emissions from industrial wastewater treatment as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>Improved activity data collection and quantification methods, and completed activity data for industrial wastewater treatment by Quarter 4;</li> <li>Improved CH<sub>4</sub> emission factors for industrial wastewater treatment by Quarter 8</li> </ul>	<ul style="list-style-type: none"> <li>Completed 2005 CH<sub>4</sub> emissions inventory in industrial wastewater treatment.</li> </ul>	Relevant government agencies fully cooperate in the provision of data required in the inventory.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
			<ul style="list-style-type: none"> <li>Completed inventory of CH<sub>4</sub> emissions from industrial wastewater treatment by Quarter 12.</li> </ul>		
Output 1.1.5.4: Inventory of GHG emissions in residential wastewater treatment	<ul style="list-style-type: none"> <li>Activity data for residential wastewater treatment</li> <li>CH<sub>4</sub> emission factors in residential wastewater treatment</li> <li>CH<sub>4</sub> emissions from residential wastewater treatment</li> </ul>	<ul style="list-style-type: none"> <li>Activity data for residential wastewater treatment in INC</li> <li>CH<sub>4</sub> emission factors in residential wastewater treatment used in INC</li> <li>CH<sub>4</sub> emissions from residential wastewater treatment as reported in INC</li> </ul>	<ul style="list-style-type: none"> <li>Improved activity data collection and quantification methods, and completed activity data for residential wastewater treatment by Quarter 4;</li> <li>Improved CH<sub>4</sub> emission factors for residential wastewater treatment by Quarter 8</li> <li>Completed inventory of CH<sub>4</sub> emissions from residential wastewater treatment by Quarter 12.</li> </ul>	<ul style="list-style-type: none"> <li>Completed 2005 CH<sub>4</sub> emissions inventory in residential wastewater treatment.</li> </ul>	Relevant government agencies fully cooperate in the provision of data required in the inventory.
Output 1.1.5.5: Inventory of N <sub>2</sub> O emissions in waste and sewage treatment	<ul style="list-style-type: none"> <li>Activity data for waste &amp; sewage treatment</li> <li>N<sub>2</sub>O emission factors in waste &amp; sewage treatment</li> <li>N<sub>2</sub>O emissions from waste &amp; sewage treatment</li> </ul>	<ul style="list-style-type: none"> <li>Activity data for waste &amp; sewage treatment in INC</li> <li>N<sub>2</sub>O emission factors in waste &amp; sewage treatment used in INC</li> <li>N<sub>2</sub>O emissions from waste &amp; sewage treatment as reported in</li> </ul>	<ul style="list-style-type: none"> <li>Improved activity data collection and quantification methods, and completed activity data for waste &amp; sewage treatment by Quarter 4;</li> <li>Improved N<sub>2</sub>O emission factors for waste &amp; sewage treatment by Quarter 8</li> </ul>	<ul style="list-style-type: none"> <li>Completed 2005 N<sub>2</sub>O emissions inventory in waste &amp; sewage treatment.</li> </ul>	Relevant government agencies fully cooperate in the provision of data required in the inventory.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
		INC	<ul style="list-style-type: none"> <li>Completed inventory of N<sub>2</sub>O emissions from waste &amp; sewage treatment by Quarter 12.</li> </ul>		
Output 1.1.5.6: Summary analysis and China's GHG inventory in waste treatment	The 2005 GHG inventory in waste treatment activities in China	Summary of GHG emissions inventory in waste treatment in the INC Report	Summary of the 2005 GHG emissions inventory in waste treatment in China by Quarter 13.	Completed summary document of the 2005 GHG emission inventory in waste treatment	
Output 1.1.6: National GHG Inventory Report	Completing the National GHG Inventory	The 1994 National GHG Inventory has already been reported in the INC.	Completing the Report on National GHG Inventory and reporting the Inventory in SNC, to be finished within Quarter 12~13.	Formulating the outline of the report and the final report to be submitted	Completed by invited experts
Output 1.2: China GHG emissions inventory database	Database for GHG emissions inventory	Database framework developed in INC (5 sub-databases)	<ul style="list-style-type: none"> <li>Completed GHG emission inventory database design by Quarter 9;</li> <li>Completed operating manuals and training on use &amp; maintenance of database by Quarter 10;</li> <li>Established database by Quarter 11</li> </ul>	<ul style="list-style-type: none"> <li>Documentation of the completed GHG emissions inventory database;</li> <li>Database installed, operated and maintained at NDRC</li> </ul>	NDRC to continue funding the maintenance and updating of the database after the SNC.
Output 1.3: GHG Emissions Projection Methodology	GHG emission forecasting tool	None	<ul style="list-style-type: none"> <li>Completed GHG emission projection and analysis model design by Quarter 6;</li> <li>Reviewed model design by</li> </ul>	Documentation of: <ul style="list-style-type: none"> <li>GHG emission projection and analysis model design;</li> </ul>	NDRC to continue enhancing the forecasting model using the updated GHG emission database.

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
			Quarter 8; ● Finalized model design by Quarter 9; ● Forecast 2010 GHG emissions by Quarter 10; ● Verified 2010 GHG emission projections by Quarter 12	● Reviewed model design; ● Finalized model design; ● Forecast 2010 GHG emission levels; ● Verified 2010 GHG emission projections	
<b>COMPONENT 2: Assessment on Impacts of, Vulnerability and Adaptation to, Climate Change</b>					
Output 2.1: Characteristics of climate change and analysis of future trends in China	Bases for future policies and actions on climate change in China	Summary of forecast climate change characteristics and analysis in the INC Report	Summary of the forecast of climate change characteristics and analysis in China by Quarter 4.	Completed summary document of forecast of climate change characteristics and analysis in China	GOC is serious in utilizing the findings and recommendations on CC Adaptation policies
Output 2.2: Assessments of impact and vulnerability of climate change on China's food production	Bases for future policies and actions on climate change adaptation in food production in China	None - V&A in food production sector was not covered in the INC Report	● Climate change V&A report on China's food supply by Quarter 8 ● Climate change impact report on China's agriculture by Quarter 10	● Completed summary document on V&A and impact analyses in China's food production and agriculture.	GOC is serious in utilizing the findings and recommendations on CC Adaptation policies in the country's agriculture & food sectors.
Output 2.3: Impact and vulnerability assessments of climate change on water resources	Bases for future policies and actions on climate change adaptation on water resources in China	Summary of V&A analysis in 7 large rivers in the INC Report	● Climate change V&A report on China's water resources by Quarter 8 ● Climate change impact report on China's water resources by Quarter 10	● Completed summary document on V&A and impact analyses on China's water resources.	GOC is serious in utilizing the findings and recommendations on CC Adaptation policies in the country's water resources
Output 2.4: Impact and	Bases for future policies	Summary of preliminary	● Climate change V&A report	● Completed summary	GOC is serious in utilizing

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
vulnerability assessments of climate change on forests and other natural ecosystems	and actions on climate change adaptation on forests and other natural ecosystems in China	V&A analysis of forests and other natural ecosystems in the INC Report	on China's forests and other natural ecosystems by Quarter 8 <ul style="list-style-type: none"> <li>● Climate change impact report on China's forests and other natural ecosystems by Quarter 10</li> </ul>	document on V&A and impact analyses on China's forests and other natural ecosystems.	the findings and recommendations on CC Adaptation policies in the country's forests and other natural ecosystems.
Output 2.5: Impact and vulnerability assessments of climate change on sea-level rise and coastal social economy	Bases for future policies and actions on climate change adaptation on sea level rise and coastal social economy in China	Summary of preliminary V&A analysis of sea level rise and coastal social economy (Zhujiang River delta inundated area) in the INC Report	<ul style="list-style-type: none"> <li>● Climate change V&amp;A report on sea level rise and coastal social economy by Quarter 8</li> <li>● Climate change impact report on sea level rise and coastal social economy by Quarter 10</li> </ul>	<ul style="list-style-type: none"> <li>● Completed summary document on V&amp;A and impact analyses on sea level rise and coastal social economy.</li> </ul>	GOC is serious in utilizing the findings and recommendations on CC Adaptation policies concerning sea level rise and coastal social economy.
Output 2.6: Impact and vulnerability assessments of climate change on human health	Bases for future policies and actions on climate change adaptation on human health in China	Summary of preliminary V&A analysis of human health in the INC Report	<ul style="list-style-type: none"> <li>● Climate change V&amp;A report on human health by Quarter 8</li> <li>● Climate change impact report on human health by Quarter 10</li> </ul>	<ul style="list-style-type: none"> <li>● Completed summary document on V&amp;A and impact analyses on human health.</li> </ul>	GOC is serious in utilizing the findings and recommendations on CC Adaptation policies concerning human health.
Output 2.7: Integrated assessment report on climate change impacts, vulnerability and adaptation	The 2005 vulnerability & adaptation strategy and plan of China	Summary of results of V&A analyses and impact assessments in the INC Report	Summary of the 2005 report on the results and recommendations of V&A analyses and CC impact assessments in China by Quarter 12.	Completed summary document of the 2005 V&A analyses and CC impact assessments	
<b>COMPONENT 3: Improving Public Awareness and Informing Policy Decision Making on Climate Change</b>					

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
Output 3.1: Sustainability of China Climate Change Info-Net	Established information sharing structure on climate change issues	Initiation of the CC Info-Net design & operation as stated in the INC report	<ul style="list-style-type: none"> <li>Identified and recommended improvements and new features by Quarter 3</li> <li>Fully-staffed and operational Info-Net by Quarter 6</li> </ul>	<ul style="list-style-type: none"> <li>Documented reports on the organization, plans, services and operations of the Info-Net</li> </ul>	<ul style="list-style-type: none"> <li>Existing Info-Net will just be upgraded</li> <li>GOC to continuously finance the operations of the Info-Net even after the SNC.</li> </ul>
Output 3.2: Compilation & dissemination of publications on China's efforts to address climate change	<ul style="list-style-type: none"> <li>Number of publications produced annually</li> <li>No. of promotional materials distributed annually</li> </ul>	<ul style="list-style-type: none"> <li>1500 promotional materials produced during the INC project</li> <li>1500 promotional materials distributed during the INC project</li> </ul>	<ul style="list-style-type: none"> <li>2000 yearly starting from Quarter 9</li> <li>2000 yearly starting from Quarter 12</li> </ul>	<ul style="list-style-type: none"> <li>Publications produced each year</li> <li>Promotional materials distributed each year</li> </ul>	Office of National Leading Group on Combating Climate Change will take lead and sustain the activities.
Output 3.3: Summary report on education, training and public awareness	Bases for future policies and actions on promoting and enhancing public awareness and knowledge on climate change in China	Education, communication and public awareness enhancement activities on climate change as reported in the INC	Summary of the 2005 report on action plans concerning promoting and enhancing public awareness and knowledge on climate change in China by Quarter 13.	Document on the 2005 report on the plans and actions concerning promoting and enhancing public awareness and knowledge on climate change	
<b>COMPONENT 4: Inventory of GHG emissions and other relevant information on climate change for Hong Kong and Macao SARs</b>					
Output 4.1: GHG Inventory of Hong Kong SAR	The 2005 GHG inventory of Hong Kong SAR	None	Summary of the 2005 GHG emissions inventory of Hong Kong SAR by Quarter 13.	Completed document of the 2005 GHG emission inventory of Hong Kong SAR	Relevant HK SAR government agencies fully cooperate in the provision of data required in the inventory.
Output 4.2: Report of information on climate	Bases of future actions and plans on CC	None	Report on the CC information in Hong Kong SAR by Quarter	Completed document on CC information in Hong Kong	Relevant HK SAR government agencies fully



Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
change in Hong Kong SAR	mitigation & adaptation in Hong Kong SAR		13.	SAR	cooperate in the provision of CC information
Output 4.3: GHG Inventory of Macau SAR	The 2005 GHG inventory of Macau SAR	None	Summary of the 2005 GHG emissions inventory of Macau SAR by Quarter 13.	Completed document of the 2005 GHG emission inventory of Macau SAR	Relevant HK SAR government agencies fully cooperate in the provision of data required in the inventory.
Output 4.4: Report of information on climate change in Macau SAR	Bases of future actions and plans on CC mitigation & adaptation in Macau SAR	None	Report on the CC information in Macau SAR by Quarter 13.	Completed document on CC information in Macau SAR	Relevant Macau SAR government agencies fully cooperate in the provision of CC information
<b>COMPONENT 5: Supporting the Implementation of the Convention at Local and National Levels</b>					
Output 5.1: National circumstances	Bases of future actions and plans on CC mitigation & adaptation in the Chinese context	Summary of National Circumstances in the INC Report	Summary of updated national circumstances by Quarter 13.	Document on the updated national circumstances report	GOC, NGO and private sector entities fully cooperate in the provision of data for the updating of the national circumstances
Output 5.2: Overview of policies and measures for climate change mitigation	Climate Change mitigation policies and measures	Climate change mitigation measures (implemented & planned) in the INC Report	Climate Change Mitigation Strategy Report by Quarter 13	Reviewed and GOC-endorsed Climate Change Mitigation Strategy Report	China will continuously update CC mitigation policies and actions as part of NC process
Output 5.3: Overview of policies and measures for climate change adaptation	Climate Change adaptation policies and measures	Climate change adaptation measures (implemented & planned) in the INC Report	Climate Change Adaptation Strategy Report by Quarter 13	Reviewed and GOC-endorsed Climate Change Adaptation Strategy Report	China will continuously update CC adaptation policies and actions as part of NC process
Output 5.4: Overview of research and systematic	Guidance on research and systematic	Basic research work on observation of	Status Report on Systematic Climate Observations by	Reviewed and GOC-endorsed Systematic	China will utilize systematic climate

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
observation	observation of climate	meteorological systems in China in the INC Report	Quarter 13	Climate Observation Report	observations for CC policy making & decisions
Output 5.5: Technology transfer and cooperation for execution of the Convention	Guidance on climate change technology transfer & cooperation	<ul style="list-style-type: none"> <li>● CC technology transfer &amp; cooperation in the INC Report</li> <li>● China Capacity Building Demand Self Evaluation Report</li> </ul>	Guidelines and action framework for future technology transfer and cooperation in China on climate change by Quarter 13	Reviewed and GOC-endorsed guidelines on technology transfer and cooperation in China on climate change.	China will continuously update guidelines on CC technology transfer & cooperation as part of the NC process
Output 5.6: Capacity Building in national communication formulation	<ul style="list-style-type: none"> <li>● Capacity needs assessment on NC formulation</li> <li>● No of trained nationals on NC formulation</li> <li>● No of trained nationals involved in the SNC project</li> <li>● Additional skilled nationals employed for NC-related activities on a regular basis</li> </ul>	<ul style="list-style-type: none"> <li>● China Capacity Building Demand Self Evaluation Report</li> <li>● 20 trained local staff in total 5 training courses, workshops and study tours during INC</li> <li>● 20 trained local staff during INC</li> </ul>	<ul style="list-style-type: none"> <li>● Report on capacity development needs on NC formulation by Quarter 4</li> <li>● 50 trained local staff in total 5 training courses, workshops and study tours by Quarter 6</li> <li>● 30 trained local staff by Quarter 9</li> <li>● 60 local experts employed by Quarter 12</li> </ul>	<ul style="list-style-type: none"> <li>● Summary of report on capacity development needs in the SNC Report</li> <li>● Documentation of training courses, workshops and study tours</li> <li>● Documentation of SNC project personnel (including consultants)</li> <li>● Documentation of employment of trained staff doing NC-related tasks</li> </ul>	GOC will continuously support the NC process and provide the required resources (including manpower) in a sustainable manner.
<b>COMPONENT 6: Publication and Dissemination of the SNC Report</b>					
Output 6.1: Draft SNC Report	Compilation of the SNC Report	● INC Report	<ul style="list-style-type: none"> <li>● Draft SNC report by Quarter 10</li> <li>● Review comments on the SNC Report by Quarter 11</li> </ul>	<ul style="list-style-type: none"> <li>● Draft SNC report for review</li> <li>● Reviewed and commented draft report</li> </ul>	Relevant stakeholders fully cooperate in the review & commenting of the draft report

Strategy	Objectively Verifiable Indicators			Means of Verification	Critical Assumptions
	Indicator	Baseline	Target		
Output 6.2: Final report of the SNC in both Chinese and English	Finalized SNC Report	<ul style="list-style-type: none"> <li>● INC Report</li> </ul>	<ul style="list-style-type: none"> <li>● Proceedings of workshop on SNC Report review by Quarter 11</li> <li>● Final SNC Report (in Chinese &amp; English) by Quarter 12</li> <li>● China SNC Report ready for submission to UNFCCC by Quarter 13</li> </ul>	<ul style="list-style-type: none"> <li>● Proceedings of SNC Report Review workshop</li> <li>● Completed SNC Report (in Chinese and English)</li> </ul>	

### SECTION III: TOTAL BUDGET AND WORK PLAN

**Table 2 Project Budget and Work Plan**

<b>Award ID:</b>	00045777
<b>Award Title:</b>	PIMS 2962 China: Enabling China to Prepare Its Second National Communication to the UNFCCC
<b>Business Unit:</b>	CHN10
<b>Project Title:</b>	PIMS 2962 China: Enabling China to Prepare Its Second National Communication to the UNFCCC
<b>Project ID:</b>	00054162
<b>Implementing Partner (Executing Agency)</b>	National Development and Reform Commission (NDRC)

<b>GEF Outcome/ Component Atlas Activity</b>	<b>Responsible Party / Implementing Agent</b>	<b>Fund ID</b>	<b>Donor Name</b>	<b>Atlas Budgetary Account Code</b>	<b>Atlas Budget Description</b>	<b>Amount Year 1 (USD)</b>	<b>Amount Year 2 (USD)</b>	<b>Amount Year 3 (USD)</b>	<b>Amount Year 4 (USD)</b>	<b>Total (USD)</b>
<b>Outcome/ Component 1: Inventory of GHG Emissions, Development of GHG Inventory and Database and Emission Projection &amp; Modeling Systems</b>	NDRC	62000	GEF	71200	International experts	50,000	15,000	0	0	65,000
				71300	National experts	85,000	67,500	62,500	30,000	245,000
				71400	Cont. Services - Individual	23,500	25,500	28,500	5,000	82,500
				71600	Travel	60,000	37,000	53,000	30,000	180,000
				72100	Cont. Services – Companies: Sub-contracts	874,000	546,500	504,500	150,000	2,075,000
				72200	Equipment	49,000	19,500	10,000	5,000	83,500
				74100	Professional Services	19,450	18,050	30,950	16,350	84,800

GEF Outcome/ Component Atlas Activity	Responsible Party / Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	Atlas Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)		
				74200	Audio Visual & Print Prod. Costs	6,600	7,200	12,600	7,800	34,200		
				74500	Miscellaneous	61,450	38,750	36,950	12,850	150,000		
				<b>Sub-Total</b>					<b>1,229,000</b>	<b>775,000</b>	<b>739,000</b>	<b>257,000</b>
<b>Outcome/ Component 2: Assessment on impact of, vulnerability and adaptation to climate change</b>	NDRC	62000	GEF	71300	National experts	0	0	0	42,500	42,500		
				71400	Cont. Services - Individual	7,500	7,500	9,000	3,000	27,000		
				71600	Travel	5,900	10,450	16,050	13,100	45,500		
				72100	Cont. Services – Companies: Sub-contracts	150,000	75,000	45,000	55,000	325,000		
						72200	Equipment	0	3,000	3,000	3,000	9,000
						74100	Professional Services: Reporting	0	5,700	1,200	8,700	15,600
						74200	Audio Visual & Print Prod. Costs	0	3,800	800	5,800	10,400
						74500	Miscellaneous	8,600	5,550	3,950	6,900	25,000

GEF Outcome/ Component Atlas Activity	Responsible Party / Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	Atlas Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)
	<b>Sub-Total</b>					<b>172,000</b>	<b>111,000</b>	<b>79,000</b>	<b>138,000</b>	<b>500,000</b>
<b>Outcome/ Component 3: Improving public awareness and informing policy-decision making on climate change</b>	NDRC	62000	GEF	71600	Travel	1,350	1,450	3,400	3,300	9,500
				72100	Cont. Service – Companies: Sub-contracts	40,000	22,000	20,000	18,000	100,000
				72200	Equipment	0	0	0	0	0
				74100	Professional Services	9,000	6,000	7,000	11,000	33,000
				74500	Miscellaneous	2,650	1,550	1,600	1,700	7,500
	<b>Sub-Total</b>					<b>53,000</b>	<b>31,000</b>	<b>32,000</b>	<b>34,000</b>	<b>150,000</b>
<b>Outcome/ Component 4: Inventory of GHG emissions and other relevant information on climate change for Hong Kong and Macao</b>	NDRC	62000	GEF	71300	National experts	20,000	20,000	20,000	20,000	80,000
				71600	Travel	12,500	12,500	12,500	12,500	50,000
				72100	Cont. Services - Companies: subcontracts	24,500	5,500	5,500	24,500	60,000
				74500	Miscellaneous	3,000	2,000	2,000	3,000	10,000

GEF Outcome/ Component Atlas Activity	Responsible Party / Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	Atlas Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)
SAR	<b>Sub-Total</b>					<b>60,000</b>	<b>40,000</b>	<b>40,000</b>	<b>60,000</b>	<b>200,000</b>
<b>Outcome 5: Supplementary support for achieving Convention objectives</b>	NDRC	62000	GEF	71300	National experts	105,175	46,475	23,625	23,225	198,500
				71600	Travel	12,500	12,500	12,500	12,500	50,000
				72100	Cont. Service – Companies	25,000	25,000	95,000	95,000	240,000
				72200	Equipment	13,500	14,500	14,500	14,500	57,000
				74100	Professional Services	1,200	9,600	13,800	18,600	43,200
				74200	Audio Visual & Print Prod. Costs	800	6,400	9,200	12,400	28,800
				74500	Miscellaneous	8,325	6,025	8,875	9,275	32,500
				<b>Sub-Total</b>					<b>166,500</b>	<b>120,500</b>
<b>Outcome 6: Publication and dissemination of the SNC Report</b>	NDRC	62000	GEF	71300	National experts	0	0	0	10,000	10,000
				72200	Equipment	0	0	2,000	2,000	4,000
				74100	Professional Services: Reporting	0	0	3,000	6,600	9,600

GEF Outcome/ Component Atlas Activity	Responsible Party / Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	Atlas Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)
				74200	Audio Visual & Print Prod. Costs	0	0	2,000	4,400	6,400
				74500	Miscellaneous	0	0	5,000	15,000	20,000
				<b>Sub-Total</b>		<b>0</b>	<b>0</b>	<b>12,000</b>	<b>38,000</b>	<b>50,000</b>
<b>Project management cost</b>										
<b>Project management and important outreach activities</b>	PMU	62000	GEF	71200	Project Coordinator	30,000	30,000	30,000	30,000	120,000
				71400	Cont. Sv - Individual	12,000	12,000	12,000	12,000	48,000
				72100	Cont. Svc – Companies: Contract management	32,500	32,500	32,500	32,500	130,000
				73100	Maintenance /Office expenses	24,000	24,000	24,000	24,000	96,000
				74500	Miscellaneous	1,000	1,000	1,000	1,000	4,000
<b>Monitoring &amp; Evaluation</b>	PMU	62000	GEF	74100	Professional Services: Audit	900	900	900	900	3,600
				74200	Audio Visual & Print Prod. Costs	600	600	600	600	2,400



GEF Outcome/ Component Atlas Activity	Responsible Party / Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	Atlas Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)
				71300	National experts	0	3,000	0	3,000	6,000
				71200	International experts	0	20000	0	20,000	40,000
<b>Total Project Management Cost</b>						<b>101,000</b>	<b>124,000</b>	<b>101,000</b>	<b>124,000</b>	<b>450,000</b>
<b>Total</b>						<b>1,781,500</b>	<b>1,201,500</b>	<b>1,180,500</b>	<b>836,500</b>	<b>5,000,000</b>

Summary of  
Funds:

GEF		1,781,500	1,201,500	1,180,500	836,500	5,000,000
Donor 2 in-kind		162,500	162,500	162,500	162,500	650,000
<b>TOTAL</b>		<b>1,944,000</b>	<b>1,364,000</b>	<b>1,343,000</b>	<b>999,000</b>	<b>5,650,000</b>

**Table 3 Project Budget by Activity**

Component/Activity	Fund Source	Annual Expenses, US\$				Total
		Year 1	Year 2	Year 3	Year 4	
<b>Component 1: Inventory of GHG Emissions, Development of GHG Inventory and Database and Emission Projection &amp; Modeling Systems</b>	<b>GEF</b>	<b>1,229,000</b>	<b>775,000</b>	<b>739,000</b>	<b>257,000</b>	<b>3,000,000</b>
1.1: Inventory of GHG Emissions		1,085,000	690,000	625,000	230,000	2,630,000
1.2: China's GHG inventory database		122,000	42,000	67,000	9,000	240,000
1.3: China's GHG projection methodology		22,000	43,000	47,000	18,000	130,000
<b>Component 2: Assessment on impact of, vulnerability and adaptation to climate change</b>	<b>GEF</b>	<b>172,000</b>	<b>111,000</b>	<b>79,000</b>	<b>138,000</b>	<b>500,000</b>
2.1: Characteristics of climate change and analysis of future trends in China		28,500	15,000	8,500	11,000	63,000
2.2: Assessments of impact of climate change on China's food production and associated vulnerability		27,500	14,000	10,500	11,500	63,500
2.3: Impact assessment of climate change on water resources and its vulnerability		29,000	15,000	8,500	11,000	63,500
2.4: Assessment on impact of and vulnerability to climate change on forest and other natural ecosystems		29,000	15,000	8,500	11,000	63,500
2.5: Assessment of climate change impact on sea-level rise and the coastal social economy, and of vulnerability		29,000	15,000	8,500	33,500	86,000
2.6: Impact of climate change on human health		29,000	15,000	8,500	11,000	63,500
2.7: Integrated assessment report on climate change impacts, vulnerability and adaptation			22,000	26,000	49,000	97,000
<b>Component 3: Improving public awareness and informing policy-decision making on climate change</b>	<b>GEF</b>	<b>53,000</b>	<b>31,000</b>	<b>32,000</b>	<b>34,000</b>	<b>150,000</b>
3.1: Sustainability of China Climate Change Info-Net		27,000	16,000	11,000	7,000	61,000
3.2: Compilation and dissemination of publication series on China's efforts to address climate change		26,000	15,000	15,000	21,000	77,000
3.3: Summary report on education, training and public awareness				6,000	6,000	12,000
<b>Component 4: Inventory of GHG emissions and other relevant information on climate change for Hong Kong and Macao SAR</b>	<b>GEF</b>	<b>60,000</b>	<b>40,000</b>	<b>40,000</b>	<b>60,000</b>	<b>200,000</b>
4.1: GHG Inventory of Hong Kong SAR		15,000	10,000	10,000	15,000	50,000

Component/Activity	Fund Source	Annual Expenses, US\$				Total
		Year 1	Year 2	Year 3	Year 4	
4.2: Report of information on climate change in Hong Kong SAR		15,000	10,000	10,000	15,000	50,000
4.3: Macao SAR's GHG Inventory		15,000	10,000	10,000	15,000	50,000
4.4: Report of information on climate change in Macao SAR		15,000	10,000	10,000	15,000	50,000
<b>Component 5: Supplementary support for achieving Convention objectives</b>	<b>GEF</b>	<b>166,500</b>	<b>120,500</b>	<b>177,500</b>	<b>185,500</b>	<b>650,000</b>
5.1: National circumstances		7,500	7,500	27,500	27,500	70,000
5.2: Overview of policies and measures for climate change mitigation		6,000	15,000	37,500	37,500	96,000
5.3: Overview of policies and measures for climate change adaptation		2,000	5,000	12,500	12,500	32,000
5.4: Overview of research and systematic observation		7,500	7,500	27,500	27,500	70,000
5.5: Technology transfer and cooperation for the implementation of the Convention		34,500	42,500	34,500	42,500	154,000
5.6: Capacity building activities		109,000	43,000	38,000	38,000	228,000
<b>Component 6: Publication and dissemination of the SNC Report</b>	<b>GEF</b>			<b>12,000</b>	<b>38,000</b>	<b>50,000</b>
6.1: Preliminary report of the SNC				12,000	17,000	29,000
6.2: Final report of the SNC in both Chinese and English					21,000	21,000
<b>Project management cost</b>	<b>GEF</b>	<b>106,000</b>	<b>109,000</b>	<b>106,000</b>	<b>129,000</b>	<b>450,000</b>
Project management and important outreach activities		104,500	104,500	104,500	104,500	418,000
Monitoring & Evaluation		1,500	4,500	1,500	24,500	32,000
<b>Total</b>		<b>1,786,500</b>	<b>1,186,500</b>	<b>1,185,500</b>	<b>841,500</b>	<b>5,000,000</b>

**SECTION IV: ADDITIONAL INFORMATION**

**PART I: OTHER AGREEMENTS (SEE ATTACHED)**

A. GEF Operational Focal Point Letter of Endorsements

B. Co-Financing Letters

## PART II: STAKEHOLDER INVOLVEMENT PLAN

**Table 3: Role of Stakeholders**

<b>Organization</b>	<b>Role in the SNC Project</b>
The State Council, PRC	Approving the final report
National Leading Group on Climate Change	Adopting the final report
NDRC	Project Executing Agency
Office of National Leading Group on Climate Change	the Organizing Agency and PSC member
MOFA	PSC member
MOST	PSC member
MOF	PSC member
Ministry of Land and Resources	Participating in the discussions of major issues
Ministry of Construction	Participating in the discussions of major issues
Ministry of Communications	Participating in the discussions of major issues
Ministry of Water Resources	Participating in the discussions of major issues
Ministry of Agriculture	Participating in the discussions of major issues
Ministry of Health	Participating in the discussions of major issues
SEPA	PSC member
CAAC	Participating in the discussions of major issues
National Bureau of Statistics	PSC member
State Forestry Administration	Participating in the discussions of major issues
Chinese Academy of Sciences	Participating in the discussions of major issues
China Meteorological Administration	PSC member
State Oceanic Administration	Participating in the discussions of major issues
Research institutes, colleges and universities	Responsible for research activities such as compilation of national GHG inventory and assessment of the impact of and vulnerability to climate change
Social groups	Participating in the publicity of the project
Others	Participating in the research and publicity of the project
UNDP Beijing Office	As the Implementing Agency of GEF, carrying out overall supervision on the project on behalf of GEF
Supporting institutions of GEF and UNDP	On behalf of GEF and UNDP, providing technical guidance to the implementation of the project

### **PART III: SUMMARY REPORT OF SELF-ASSESSMENT EXERCISE**

In accordance with the Convention, each party has the obligation to communicate its information on climate change, including the national inventories of anthropogenic emissions by sources and removals by sinks, the overall description of the measures taken or envisaged for the implementation of the Convention as well as other information that the party considers suitable to submit. The Chinese Government attaches great importance to fulfilling its international obligations. In accordance with the *Guidelines for the preparation of national communications from non-Annex I Parties*, the Chinese Government has engaged officials and experts from relevant government agencies, research institutions, colleges and universities, social organizations and enterprises in the preparation of the INC. The report was approved by the State Council after it was discussed and adopted by the National Coordination Committee on Climate Change. The draft report was completed with 3 years of efforts by over 400 experts from more than 100 organizations, and then revised several times on the basis of broad stakeholder consultations. The report was finally approved by the State Council after it was discussed and adopted by the National Coordination Committee on Climate Change and was officially submitted to the 10<sup>th</sup> Conference of the Parties of the Convention on December 10, 2004.

China's INC covers national circumstances, national greenhouse gas inventory, impacts of climate change and adaptation, policies and measures related to climate change mitigation, research and systematic observation, education, training and public awareness, and needs for funding, technologies and capacity building, basically reflecting China's national situation. In accordance with the relevant provisions of the Convention, the report provides a 1994 national greenhouse gas inventory in Chapter 2, and general descriptions in other chapters on China's situation of years up to 2000, with some up to 2003. The contents and nationwide data in the report do not cover that of the Hong Kong Special Administrative Region, the Macao Special Administrative Region and Taiwan Province except for division of administrative areas, territory and other points as specified.

During the implementation of Project on Enabling China to Prepare Its Initial National Communication, the Office of the NCCCC under the NDRC, as the national executing agency, required the institutions involved in the preparation of the INC to conduct their work in accordance with the requirement of the *Guidelines for the preparation of national communications from non-Annex I Parties* to the Convention as contained in Decision 10/CP.2 and using as references *IPCC guidelines* and *IPCC Good Practice Guidance*. The participating institutions had organized research and compilation teams with national levels expertise in research and policy aspects. These research teams had also solicited and considered suggestions and recommendations from relevant international and domestic experts.

In light of specific national circumstances, financial resources available were limited for the preparation of China's INC, causing such problems as imperfect methods, insufficient representative data and limited participation. Therefore, it is proposed that further improves will be made in the following aspects in the implementation of "Enabling China to Prepare Its Second National Communication" project, in accordance with the *Guidelines for the preparation of national communications from non-Annex I Parties* and China's national circumstance.

#### **3.1. National GHG Inventory**

In accordance with the requirements of the UNFCCC *Guidelines for the preparation of national communications from non-Annex I Parties* and the specific conditions of China, the National GHG

Inventory for China in the year 1994 includes estimated net anthropogenic GHG emissions from the energy sector, industrial processes, agriculture, land-use change and forestry, and wastes, and reports on emissions of such gases as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O).

The 1994 Inventory was prepared with methods provided by the *IPCC guidelines* and using *IPCC Good Practice Guidance* as a reference. The inventory agencies established the technical approaches for developing the 1994 National Inventory on the basis of defining China's sources of emissions, ascertaining the key sources of emissions, the availability of activity data and emission factors and analyzing the applicability of the IPCC methodologies.

According to the INC, the national total amount of carbon dioxide emissions in 1994 was 3,073 million tonnes and the carbon sink from land-use change and forestry was about 407 million tonnes; after deducting the carbon sink, the net emission of carbon dioxide in 1994 was 2,666 million tonnes (about 727 million tonnes of carbon), and the per capita emission was about 0.6 ton carbon/year. In 1994, the total amount of methane emissions in China was approximately 34.29 million tonnes and that of nitrous oxide was about 0.85 million tonnes. By using the global warming potentials (GWP) on the 100 year horizon given in the IPCC Second Assessment Report, methane and nitrous oxide emissions were converted into equivalents of carbon dioxide. As a result, China's total GHG emissions in 1994 were 3,650 million tonnes of carbon dioxide equivalent, of which carbon dioxide, methane, and nitrous oxide accounted for 73.05%, 19.73%, and 7.22% respectively. In addition, it was estimated that carbon dioxide emission from international bunker fuels (international aviation and international navigation) in China was 10.85 million tonnes.

**Table 4: 1994 National Greenhouse Gas Inventory of China (Gigagram)**

<b>Greenhouse Gas Source and Sink Categories</b>	<b>Carbon Dioxide</b>	<b>Methane</b>	<b>Nitrous Oxide</b>
Total (Net) National Emission (Gigagram per year)	2665990	34287	850
1. All energy	2795489	9371	50
Fuel combustion	2795489		50
Biomass burned for energy		2147	
Oil and natural gas system		124	
Coal mining		7100	
2. Industrial processes	277980		15
3. Agriculture		17196	786
Enteric fermentation		10182	
Rice cultivation		6147	
Savanna burning		N/A	
Others		867	786
4. Land-use change and forestry	-407479		
Changes in forest and other woody biomass stock	-431192		
Forest and grassland conservation	23713		
Abandonment of managed lands	Not estimated		
5. Others		7720	
Disposal of waste		7720	

In order to reduce uncertainties in the estimation of the GHG inventory, the inventory agencies made great efforts with focus on such aspects as data and methodology.

With regard to data, the emphasis was placed on ensuring the accuracy of the data used. The most important measure is that official statistical data were used wherever possible. In the course of preparing the inventory, the inventory agencies work closely with the State Statistical Bureau, industrial associations and relevant professional institutions to ensure obtaining authentic and reliable official data. In case of non-availability of official data, in order to guarantee the quality of the estimation in the inventory, a large amount of sample surveys and measurements were conducted, for instance, survey on industrial boilers, coal quality analysis and survey, survey on methane emission from coal mines, survey on cement enterprises, survey on lime enterprises, survey on adipic acid producing enterprises, cement clinker sample measurement, experimental measurement on calcification of using lime, measurement of methane emission from rice fields, etc.

With regard to methodology, the inventory agencies followed the method of the *IPCC guidelines* while modified some aspects to cope with the specific situation in China, which guaranteed the comparability, transparency and consistency of the estimations in the inventory. In selecting the estimation approaches for preparing the inventory, the inventory agencies held many methodology seminars to solicit opinions extensively and consider arguments fully so as to ensure that the methodology used for preparing the inventory was scientific, feasible and effective. Where conditions permitted, higher tiers methods were selected as far as possible.

In spite of the fact that the inventory agencies had made improvements in preparing the 1994 national greenhouse gas inventory in such aspects as the scope of, the method used for and the quality of the inventory, it should be noted that there still exist large uncertainties. Firstly, China as a developing country is rather weak in terms of the basis of statistical data, particularly there are a lot of difficulties related to the availability of activity data in relation to the estimation of greenhouse gas emissions and a substantial part of the indexes on activity data has not yet been included in the statistical system. Secondly, in the course of preparing the greenhouse gas inventory covering energy, industrial processes, agriculture, land-use change and forestry and waste management sectors, methods such as sample survey and on-site observation and measurement have been used to obtain information necessary for preparing the inventory. Owing to the constraints including funds and time, there are inadequacies in the time-length for observation and measurement, and uncertainties as whether the observations and sample points are representative of the relevant sectors. Due to the lack of country-specific emission factors, default emission factors provided by the *IPCC guidelines* have been adopted for some source categories. This led to uncertainties to some extent for the estimation.

Based on the above-mentioned situation, it is proposed that during the PDF-B project implementation, an investigation be conducted on major scopes of compilation of national greenhouse gas inventory and major efforts needed to reduce uncertainties. The compilation of the SNC will be an opportunity to further improve the coverage of China's 2005 national greenhouse gas inventory and to reduce uncertainty of the inventory. The *Guidelines for the preparation of national communications from non-Annex I Parties* require a wider coverage of greenhouse gas categories. It is proposed that during the PDF-B project implementation, an investigation be conducted on the availability of activity data and country-specific emission factors related to these source categories in light of China's specific situations. Furthermore, in accordance with the reporting requirements of Decision 17/CP.8, during the implementation of PDF-B project, a detailed analysis on methodologies necessary for greenhouse gas emission estimation will be conducted, so that a national greenhouse gas inventory with



improved completeness, comparability and transparency is given, and that the present network for inventory compilation is further enhanced with the achievement of a more sustainable base for data collection and management.

## **(1) Energy sector**

In the INC, the inventory agencies adopted both the reference approach and the sectoral approach based on detailed technology information as recommended by *the IPCC Guideline* for the compilation of GHG inventory for combustion of fossil fuels; adopted both the reference approach and the sectoral approach as recommended by *the IPCC Guidelines* for the compilation of GHG inventory for combustion of biomass fuels; adopted both the IPCC Tier 2 method (coal mines average method) and IPCC Tier 3 method (mine survey method) for the estimation of methane emissions from coal mining and post-mining activities; adopted IPCC Tier 3 method for the estimation of fugitive methane emissions from the oil and gas system. It is expected that higher tier method (tier 3) is used for estimation of energy-related GHG emissions wherever possible and estimations resulted with different methods are compared and analyzed, through this project.

Because the existing statistical materials and data could not fully meet the needs for preparing the inventory during the INC compilation, part of the activity data could only be obtained by adopting the methods of investigation and expert judgment. For example, activity data by devices in some important industries, such as building materials and metallurgy, was based on expert judgment; owing to the lack of the measured data on the emission factors from coal combustion by sectors and by devices, the relevant potential emission factors and oxidation rates could only be determined through case studies, questionnaires and partial supplementary measurements; due to the lack of detailed measurement data, methane emissions under different circumstances from different types of biomass stoves could only be estimated by using the same emission factors; because of the lack of methane fugitive emission data in some processes of the oil and gas system, default values from sources such as IPCC were used. All these would affect the accuracy of energy-related inventory. It is expected that the effect of these factors on the quality of energy-related inventory could be reduced through this project.

## **(2) Industrial Processes**

In the INC, the report of industrial process inventory followed the methodologies recommended in the *IPCC guidelines*. Clinker production was used as activity data for the estimation of emissions from cement production, and the impact of magnesium oxide content in the clinker on emission factors was considered as well. For lime production, production volumes of lime by provinces were used as activity data for the estimation of emissions from lime production. For iron and steel production, both the emissions from carbonates use as flux such as lime stone, magnetite and dolomite and the emissions due to carbon content reduction in the steel making process were included. It is expected that through this project, more emission source categories of industrial processes will be covered and the emission estimation will use more province-specific methods when applicable.

The uncertainties in the emission estimates of cement production mainly came from the statistical errors on the output of clinker, the errors in the estimation of the flue ash loss of cement kilns and the errors in measuring the content of calcium oxide and magnesium oxide. The uncertainties in the emission estimates of lime production mainly came from the errors on the estimation of activity data, including the possible incompleteness in the scope covered by the statistics on the production of lime

used as building materials and the statistical errors on the production of lime used in metallurgical and chemical industries. The uncertainties in the emission estimates of iron and steel production mainly came from the statistical errors in limestone use, the errors in the chemical detection of calcium carbonate content in limestone, the effect of the water content in limestone, and the errors in measuring the content of carbon in pig iron and in steel products. The uncertainties in the emission estimates of calcium carbide production came mainly from the errors in measuring the purities of calcium carbide and limestone. The uncertainties in the emission estimates of adipic acid production came mainly from the statistical errors of the enterprises in adipic acid production, the errors in measuring the gas concentration of nitrous oxide in the industrial tail gas, and the errors in the measurement of the nitrous oxide emission control facilities. All these uncertainties affected the quality of the INC inventory. It is expected that the effect of these factors on the quality of industrial processes inventory could be reduced through this project.

### **( 3 ) Agriculture**

Estimation of methane emissions from paddy rice fields generally followed the methodologies recommended in the *IPCC guidelines*. In the light of the specific conditions in China, paddy rice fields were divided into four major first-class categories, namely, double-harvest early rice, double-harvest late rice, single-harvest rice and winter-flooding fields. In estimating the direct emissions of nitrous oxide from cropland, the inventory agencies mostly followed the *IPCC guidelines* and the *IPCC Good Practice Guidance*, while has improved the IPCC methodologies in the light of the specialties of cropland management in China as well as the availability of relevant data on activity levels and emission factors. With regard to the estimation of indirect emissions of nitrous oxide from cropland caused by runoff and leaching, the inventory agencies defined the specific rates for the nitrogen loss from various types of cropland and estimated the amount of emissions by adopting the IPCC methodology and default emission factors. The emission sources of methane by animals were in conformity with the emission sources defined by the IPCC, IPCC Tier 1 method was adopted to calculate methane emission from swine and camel and IPCC Tier 2 method was adopted to estimate the methane emissions from other key sources (non-dairy cattle, dairy cattle, buffalo, goat, and sheep). The inventories of methane and nitrous oxide emissions from animal manure management systems involved 11 main domestic animals and poultry, IPCC Tier 2 method was adopted for swine, cattle, goat/sheep and chicken, and IPCC Tier 1 method was used for other emission sources. It is expected that higher tier method could be used for estimation of agriculture-related GHG emissions wherever possible and estimations resulted with different methods (IPCC methods and revised methods) are compared and analyzed, through this project.

The reason for the uncertainties in the estimation of methane emission from rice fields in the INC was mainly because of the shortcomings of the adopted model. The model did not possess the function of calculating the emission factors for the winter-flooding paddies during the non-growing period. The effects of precipitation during the non-rice period, soil characteristic as well as applications of organic manure and nitrogen fertilizers, which affected emission factors, were not taken into account either. The reasons for the uncertainties in the estimation of the direct emission of nitrous oxide from croplands were mainly because the existing observations were poor in representing different climatic regions, different types of croplands and different practices of field management, and also the time span for the observation of individual direct emission factor was not long enough. In addition, because of the lack of actual observation data on the indirect emission of nitrous oxide from croplands, the default emission factors and other default parameters provided by the *IPCC guidelines* were adopted. In regard to the estimation of methane emission from enteric

fermentation, and methane and nitrous oxide emissions from the animal manure management systems, the uncertainties were mainly attributed to two aspects, that is, the investigation data used for estimating the emissions could not yet reflect the actual circumstances, and the lack of observation data on emission factors. For example, only methane emission from non-dairy cattle was based on continuously measured emission factors, while there was no data of emission factors based on continuous observation for the other key emission sources. Both the observed and default data mentioned above affected the accuracy of the inventory in the INC. It is expected that the effect of these factors on the quality of agriculture inventory could be reduced through this project.

#### **( 4 ) Land-use change and forestry**

In the INC, carbon emissions caused by changes in the biomass stocks of forest and other woody, and the conversion of forest, were estimated in accordance with the characteristics of land-use change and forestry activities in China and the *IPCC guidelines*. This inventory includes the estimations of the carbon absorbed due to the growth of standing forest, open forest, four-side trees and scattered trees, and of carbon emitted due to the consumption of forest. The estimations were based on the data on the accumulated amount of the standing volume and their net increment as well as the net consumption of forest, at both national and provincial levels obtained through the national forest resources survey, in combination with the data on the average wood density, biomass expansion factor, and carbon content. The carbon stock changes of economic forests and bamboo stands were calculated mainly on the basis of annual area changes, average biomass volume, and carbon content of the economic forests and bamboo stands in all provinces. The forest conversion included the conversion of existing forests to other land uses, such as agriculture, pasture, town sites and roads, etc. Carbon emissions caused by biomass burning and decomposition of the biomass above ground were estimated according to methodologies provided by *the IPCC Guidelines*. It is expected that through this project, the GHG emissions from land-use change and forestry could be estimated according to the revised *IPCC guidelines* and, where applicable, disaggregated to provincial levels.

The uncertainties of the estimates of land-use change and forestry sector mainly came from the following aspects: there was a great discrepancy in the growth rate of different tree species, different types of forests as well as that of open forests, scattered trees and four-side trees. As the national forest resources survey did not provide the data on the growth rate of different tree species and different types of forests except the growth rate of the standing volume, there was no way to calculate emissions by different types. Owing to the lack of the data on the annual increase of biomass per unit area of bamboo and economic forests, changes in the area and biomass storage per unit were used for calculation. This gave rise to certain uncertainties. The biomass expansion factors applied might lead to considerable uncertainties. Due to the lack of relevant domestic parameters, IPCC default emission factors were applied in many cases, which may cause some uncertainties. Owing to the lack of data, carbon dioxide emissions from forests conversion could not be calculated for provinces, tree species or types of forests, so national average values were adopted for both the activity data and emission factors. This also caused some uncertainties. These parameters mentioned above had an effect on the inventory quality. It is expected that the effect of these factors on the quality of land-use change and forestry inventory could be reduced through this project.

#### **( 5 ) Waste treatment**

The inventory agency calculated the methane emission from municipal solid waste treatment using

the default method given in the *IPCC guideline*. To calculate the methane correction factor (MCF), the whole country was divided into 7 regions according to the differences of the city scale and the regional economic development level. This helps to identify the differences of waste management modes among different regions. To determine the degradable organic carbon (DOC) of municipal solid waste, the special feature of the wide span of climatic regions between the north and the south, the large expanse of land in China, and the difference in the composition of waste due to the differences of resident customs in different regions were fully considered. The inventory agency adopted the emission factors recommended by the IPCC to estimate the methane emission from the treatment of domestic and industrial wastewater. Meanwhile, estimates based on urban population and per capita wastewater emission were done as recommended by *the IPCC Guidelines* and were used for the comparison with the previous estimate. It is expected that through this project, the GHG emissions from waste treatment could be estimated with higher tier methods recommended by the *IPCC guidelines* and where applicable, disaggregated to provincial levels.

The uncertainties contained in the inventory of the municipal solid waste treatment were mainly caused by the parameters of the proportion of degradable organic carbon and the proportion of methane in the gas released from landfills recommended in the *IPCC Good Practice Guidance*. The uncertainties contained in the inventory of the emission from the wastewater treatment were mainly from the lack of the measured values of degradable organic carbon contained in the organic waste of the domestic sewage and the industrial wastewater. The inaccuracy of these parameters and default data impacted the quality of the Inventory. The Second National Communication project will seek to reduce the impacts of these factors on inventory quality. It is expected that the effect of these factors on the quality of waste treatment inventory could be reduced through this project.

### **3.2. Impacts of Climate change and Adaptation**

Since no funds were allocated in the INC project to research on impact of and adaptation to climate change, relevant information used in the INC is mainly from the preliminary research outcomes of some Chinese scientists, which include assessment methods and models, characteristics of climate change in China, water resources, agriculture, terrestrial ecosystem, changes in sea level, coastal zone and offshore ecosystem, adaptation measures, and uncertainties and priorities for further study, etc.

Up to now, assessments on the impact of climate change in China still contain considerable uncertainties. This is because: methods for projecting future climate change are not perfect enough and social-economic scenarios are not certain; it is difficult to distinguish the impact of climatic factor from that of other factors; the method used for assessing the impact is not yet perfect, and most models for assessment are static models and have not been given sufficient parameter rating and validation. In order to reduce the uncertainties in the assessment, it is necessary to: improve the projection of global climate models, develop regional climate models suitable to China; support impact assessment models developed by Chinese scientists, and carry out sufficient validation and improvement of foreign models. Present impact assessments in China are mainly focused on agriculture, water resources, terrestrial ecosystems and coastal zones. Apart from continuing efforts in strengthening, improving and expanding the assessment of impacts of climate change in these aspects, research should also be conducted in such aspects as human health, tourism, energy, national key projects and building facilities, etc. Furthermore, the climates in different regions of China could be very different because of the vast space and different situations of different regions, so there is a particular need to conduct a thorough study on the impact of climate change on different regions, so as to find out concrete adaptive measures suitable to the circumstances of different regions.

Based on the above-mentioned factors, it is recommended that during the implementation of PDF-B project, investigation be conducted on the feasibility of targeted research on impact and adaptation. It is expected that the assessment models are further improved and the coverage of climate change impact assessment is increased, taking advantage of the SNC compilation opportunity, so as to improve China's research ability on the assessment of the impact of, vulnerability and adaptation to climate change.

### **3.3. Policies and Measures related to climate change mitigation**

According to decision 10/CP.2 and the specific situations in China, Chapter 4 of the INC (Policy and Measures Related to Climate Change Mitigation) described China's major policies and measures related to climate change mitigation in such aspects as integrated policies and measures, energy industry, energy conservation, industry, building energy saving, transportation, agriculture, forestry, municipal waste treatment, and international collaboration.

Climate change mitigation policies and measures cover various aspects of the social and economic development. Although efforts had been made to summary comprehensively policies and measures that the Government of China had taken and were going to take to promote sustainable development strategy, to improve energy efficiency, to develop hydro power and other renewable energy, and to promote plantation, there were only general description of these policies and measures, due to limited time and resources available. Furthermore, the description are focused on existing regulations, there were no description of the effects of implementation of these policies and measures as well as major existing barriers, and there were also some shortcomings in the design of the reporting framework of that chapter.

It is proposed that during the implementation period of the PDF-B exercise, the possibilities of increasing the reporting scope of climate change mitigation policies and measures, possible corresponding methodological issues and activities to be implemented will be discussed, taking full consideration of encouraging reporting requirements as contained in decision 17/CP.8. It is expected that the quality of information contained in SNC will be further improved.

### **3.4. Other Information**

#### **3.4.1. Research and Systematic Observation**

“Research and Systematic Observation” was described in Chapter 5 of the INC. This chapter provides rather complete overall description on China's current research and systematic observation status as well as existing problems and improvement plan in climate system observation, history and present statues of climate change research, major achievements of climate change research, existing problems and development perspectives of climate change research etc.

Even though China has already established a basic climate observation network and also enhanced monitoring of inland climate change and its impact through the efforts during the past several decades, there are still some problems, including limited number of observation stations, uneven distribution of these stations, limited observation items, short time series, non-unified data formation and quality standards, etc. In the meantime, in as early as the mid-1980s, Chinese scientists joined discussions on and formation of international climate change and global change research programs and were involved in most research activities of world climate change research program and the

international geosphere-biosphere program, and the Government of China also provided financial support for climate change related research. Through these activities, knowledge of the Chinese scientists on climate change was improved.

However, there are still some gaps between these achievements and the internationally advanced research activities. Major gaps include needs for new modeling tools and research methodology, lack of fundamental research, lack of integrated research etc. It is proposed that during the implementation of PDF-B project, preliminary discussions will be carried out on the reporting scope of research and systematic observation as well as possible necessary activities to be conducted, with the aim of improving the quality of relevant information to be included in SNC.

### **3.4.2. Education, Training and Public Awareness**

In chapter 6 of INC (Education, Training and Public Awareness), introduction has been given to efforts made and major activities conducted by the Government of China and other organizations on climate change-related education, training and public awareness raising, including information on the establishment and operation of the “China Climate Change Info-Net” supported by the INC project. Long- Term strategy and near- Term action targets in China to raise public awareness on climate change were also briefly described. It is proposed that during the implementation of PDF-B project, preliminary discussions be carried out on the reporting scope of education, training and public awareness raising as well as possible necessary activities to be conducted, with the aim of improving the quality of relevant information to be included in SNC.

### **3.4.3. Needs for Funding, Technologies and Capacity Building**

In chapter 7 of the INC (Needs for Funds, Technologies and Capacity Building), the needs for funding, technologies and capacity building were briefly raised, with the aim of supporting China, as a non-Annex I Party, to effectively fulfill its commitments under the UNFCCC. China has already completed sub-project “National Capacity Need Assessment and Strategy for Capacity Building” under the “GEF/UNDP Global Environment Governance National Capacity Self-Assessment Project (NCSA)”. However, no corresponding activities have been implemented in this aspect. Therefore, it is proposed that during the implementation of the PDF-B project, preliminary discussion be carried out on the reporting scope of information on needs for funding, technologies and capacity building, with the aim of improving the quality of relevant information to be included in the SNC.

### **3.4.4. Scenarios for China’s future GHG emissions**

In chapter 2 of the INC (National Greenhouse Gas Inventory), major factors affecting China’s future GHG were analyzed. These factors include population growth and urbanization, economic development and consumption, the expansion in people’s daily necessities, economic restructuring and technological progress, and the changes in forestry and ecological preservation and construction. The INC did not specifically provide future GHG emission scenarios established by modeling analysis.

It is proposed that during the implementation of the PDF-B project, the possibilities of developing China’s future GHG emission scenarios as well as possible corresponding activities to be implemented be discussed, taking full consideration of the encouraged reporting requirements as contained in the *Guidelines for the preparation of national communications from non-Annex I Parties*, with a view to disseminating relevant information in the SNC to the international community.

### **3.4.5. Reporting of other information related to the implementation of the Convention in China**

As the UNFCCC is also applied in the Hong Kong and the Macao SARs, the PDF-B will also analyze in details whether and how to include climate change related information of Hong Kong and Macao in the SNC, with a view to providing more complete information in the SNC.

### **3.5. Institutional Capacity Enhancement**

China has already established relevant organizations, research teams and evaluation procedures for the preparation of China's national communications through the effective implementation of the INC project. The NCCCC is the coordinating agency for climate change policies and measures in China, and is responsible for organizing the final assessment of national communications and submitting to the State Council the report for approval. The Office of NCCCC in the NDRC is responsible for the implementation of climate-related capacity building activities, and had organized the compilation of the INC. To give more detailed and effective guidance, the NCCCC also organized a project steering committee comprised of representatives from the NDRC, Ministry of Foreign Affairs, Ministry of Finance, MOST, SEPA and China Meteorological Administration. To manage more effectively the capacity building activity, Office of NCCCC established Project Management Office.

Through the effective implementation of the INC project, the capacity of China's relevant organizations and experts had been greatly improved. More than 100 research institutes, colleges and universities, industry associations, enterprises and NGOs were directly or indirectly involved in the INC project, including: Energy Research Institute (ERI) of NDRC, Institute of Atmospheric Physics (IAP) of Chinese Academy of Sciences, Agricultural Meteorology Institute of Chinese Academy of Agricultural Sciences, Forest Ecology & Environment Institute (FEEI) of Chinese Academy of Forestry, Center for Climate Impact Research (CCIR) of Chinese Academy of Environmental Sciences, The Administration Center for China's Agenda 21, China Economy Network Corporation, Tsinghua University, China Cement Industry Association and China Lime Industry Association etc. About 400 experts were directly or indirectly involved in the project, including 29 experts contracted directly by the PMO. More than 1000 person- Times have been involved in various training meeting and workshops, including: 71 participants for the inception meeting of the project, 185 person- Times for 6 inception workshops of different sub-projects, 266 person- Times for eleven training workshops on methodological issues, 130 person- Times for four training workshops on data collection, 146 person- Times for three training workshops on public awareness, 153 person- Times for two government and expert reviewing workshops, 805 person- Times for 53 other workshops. 7 persons participated in international trainings for a total period of 9 months, 35 person- Times were involved in 10 international trips, and 16 people took part in 10 international workshops.

To improve the quality of the SNC, it is proposed that during the implementation of the PDF-B project, capacity building activities as needed for further enhancement of relevant organizations, research teams and expert network be analyzed, with a view to giving the full play to the role of the existing organizations and experts as well as of engaging more stakeholders in the compilation of the SNC.

### **3.6. Translation of National Communication and Dissemination of relevant Reports and Materials**

The effective implementation of the INC project has produced many reports and materials,

including project progress reports, methodological reports, GHG inventory reports, special reports, experts reports, workshop proceedings, the INC (Chinese version), Chinese and English versions of the executive summary of the INC, 55 newsletters, a synthesis report “Ten Years of UNFCCC – China’s Efforts”, basic readings on climate change, etc. Compilation and dissemination of these reports and materials played a very positive role in promoting the effective execution of the project and raising public awareness on climate change.

With a view to improving the translation and dissemination of relevant reports and materials, it is proposed that the PDF-B discuss possible capacity building activities needed to enhance compilation and dissemination of reports and materials. The PDF-B will also discuss capacity building activities that are possibly needed for the translation of the SNC, taking into account the specific situation of the translation of the INC as well as the needs of the international community to learn more information about China’s climate related information.

#### **PART IV: PROJECT RISKS AND ASSUMPTIONS**

The effective implementation of this project is highly dependent on the following three assumptions. Firstly, there is a strong and standing Implementing Agency which is able to effectively supervise and facilitate the full implementation of corresponding functions by relevant project participants. Secondly, there is a long- Term and standing operational mechanism for financial supports, including the GEF funds and domestic in-kind contributions, so as to ensure the effective implementation of activities under this project. Thirdly, there is a standing project team with deep sense of responsibility and efficiency, which is able to effectively carry out all activities of the project. Therefore, the risks of this project are related to the possible failure of meeting the above three assumptions. The potential risks that may arise in the implementation of this project and corresponding necessary assumptions are also valid for all outputs of the project.

Furthermore, to ensure that all outputs of this project can be produced as scheduled and with high quality, it is also necessary to enhance the sense of responsibility and to improve further the capacity of the project participants. The international experts as well as the external review experts should also play an effective role.

In addition, a good external environment, including stable domestic and international political, financial and social environment, is also necessary for the effective implementation of this project.



**PART V: PROJECT MONITORING AND EVALUATION PLAN**

**Table 5: Preliminary Project Monitoring and Evaluation Plan**

Type of M&E activity	Responsible Parties	Budget, US\$ <sup>5</sup>	Time frame
Inception Workshop	<ul style="list-style-type: none"> <li>▪ Project Coordinator</li> <li>▪ UNDP CO</li> <li>▪ UNDP GEF RCU</li> </ul>	Part of Component V budget	Within first two months of project start up
Inception Report	<ul style="list-style-type: none"> <li>▪ Project Team</li> <li>▪ UNDP CO</li> </ul>	Part of Component V budget	Immediately following IW
Measurement of Success Indicators for Project Progress and Performance	<ul style="list-style-type: none"> <li>▪ UNDP GEF RTA and Project Coordinator</li> <li>▪ Measurements by regional field officers and local IAs</li> </ul>	Part of Component V budget	Annually prior to APR/PIR and to the definition of annual work plans
APR and PIR	<ul style="list-style-type: none"> <li>▪ Project Team</li> <li>▪ UNDP-CO</li> <li>▪ UNDP-GEF RCU</li> </ul>	Part of Component V budget	Annually
TPR and TPR report	<ul style="list-style-type: none"> <li>▪ Government Counterparts</li> <li>▪ UNDP CO</li> <li>▪ Project Team</li> <li>▪ UNDP-GEF RCU</li> </ul>	Part of Component V budget	Every year, upon receipt of APR
Steering Committee Meetings	<ul style="list-style-type: none"> <li>▪ Project Coordinator</li> <li>▪ UNDP CO</li> </ul>	Part of Component V budget	After IW and at least once a year thereafter
Periodic status reports	<ul style="list-style-type: none"> <li>▪ Project Team</li> </ul>	Part of Component V budget	TBD by Project Team and UNDP CO
Technical reports	<ul style="list-style-type: none"> <li>▪ Project Team</li> <li>▪ Hired consultants as needed</li> </ul>	Part of Component V budget	TBD by Project Team and UNDP-CO
Mid- Term External Evaluation	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ UNDP- CO</li> <li>▪ UNDP-GEF RCU</li> <li>▪ External Consultants</li> </ul>	US\$ 3,000	At the mid-point of project implementation
Final External Evaluation	<ul style="list-style-type: none"> <li>▪ Project Team</li> <li>▪ UNDP-CO</li> <li>▪ UNDP-GEF RCU</li> <li>▪ External Consultants</li> </ul>	US\$ 23,000	At the end of project implementation
Terminal Report	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ UNDP-CO</li> <li>▪ External Consultant</li> </ul>	Part of Component V budget	At least one month before the end of the project
Lessons learned	<ul style="list-style-type: none"> <li>▪ Project Team</li> <li>▪ UNDP-GEF RCU</li> </ul>	Part of Component V budget	Yearly (2.5 year)
Annual Audit	<ul style="list-style-type: none"> <li>▪ UNDP-CO</li> <li>▪ Project Team</li> </ul>	US\$ 6,000	US\$ 1500 Yearly (4 years)
Visits to field sites (UNDP staff travel costs to be charged to IA fees)	<ul style="list-style-type: none"> <li>▪ UNDP Country Office</li> <li>▪ UNDP-GEF RTA (as needed)</li> <li>▪ Government representatives</li> </ul>		Yearly (4 year)
<b>TOTAL indicative COST</b>		<b>US\$ 32,000</b>	

<sup>5</sup> Excluding Project Team staff time and UNDP staff & travel expenses

## **APPENDIX: TERMS OF REFERENCES**

### **Terms of Reference for the Project Steering Committee (PSC)**

In order to enhance the overall planning of, and guidance for the project implementation, a PSC will be established.

#### ***Members***

The members of the PSC will come from the Department of Resource Conservation and Environmental Protection under the NDRC, the Department of Treaty and Law of MOFA, the Department of International Cooperation of MOF, the Department of Social Development of MOST, the Department of International Cooperation of SEPA, the Department of Science and Technology of China Meteorological Administration, and UNDP Resident Coordinator in China.

#### ***Duties***

- Provide guidance to the major issues during project implementation.
- Ensure the consideration of China's obligations under the Convention and the Kyoto Protocol during the implementation of the project.
- Ensure that the project is carried out in accordance with the activities/outputs and outcomes as outlined in this project
- Participate in Steering Committee Meetings, workshops and working seminars as appropriate.
- Monitor the performance of the project by Project Evaluation.
- Monitor and guide the dissemination activities.
- Facilitate inter-ministerial and inter-sectoral collaboration.

### **Terms of Reference for National Project Director (NPD)**

NDRC will appoint an official at Director-General level to serve as the NPD, and the NPD will be in charge of the project on behalf of NDRC.

#### ***Duties***

- Responsible for overall project planning and management.
- Supervise the implementation process.
- Ensure that the activities are completed on time.
- Ensure that the outputs of the project comply with what are stated in this project document.
- Review project budget revisions and responsible for project expenditures.
- Enhance the coordination with relevant government departments and stakeholders.
- Attend workshops and working seminars as appropriate.

### **Terms of Reference for Project Coordinator (PC)**

The project will recruit a Project Coordinator (PC) to work full time during the project implementation. He or she will work closely with the NPD, all international and national consultants and subcontractors.

### ***Tasks***

- Assume operational management of the project in consistency with the Project Document and UNDP policies and procedures for nationally executed projects.
- Prepare and update the project work plan as required; submits updates to UNDP and reports on work plan progress to the NPD and UNDP as requested.
- Assist in the finalization of TORs for the rapid assessment; assist in the identification and selection of consultants and sub-contractors to undertake the rapid assessment.
- Organize Steering Committee Meetings, national workshops and national working seminars.
- Maintain regular professional communication with the NPD and UNDP.
- Assist in the use of UNDP/GEF funds according to all UNDP administrative and financial procedures.
- Ensure that appropriate accounting records are kept.
- Facilitate and cooperate with audit processes at all times as required.
- Prepare the required reports as scheduled and liaises with UNDP staff to organize reviews, and project visits.
- Supervise the project staff and consultants assigned to project.
- Assist in the critical review and finalization of the reports from the national consultants.

### ***Qualifications***

- Appropriate University Degree in biodiversity, conservation, natural resources management, environmental management or other relevant majors.
- Substantial experience and familiarity with the Chinese administration in order to facilitate policy and technical dialogues with high ranking officials in the PRC and the international community.
- Verified excellent project management, team leadership, and facilitation.
- Ability to coordinate a large, multidisciplinary team of experts and consultants.
- Fluency in English.

### **Terms of Reference for Assistant to Project Coordinator (APC)**

The project will recruit an Assistant to Project Coordinator (APC) to support the PC in carrying out the day- To-day activities.

### ***Tasks***

- Assist in the project coordination, administrative and financial management.
- Assist in organizing Steering Committee Meetings, national workshops and national working seminars.
- Assist in identification and selection of consultants and subcontractors.
- Assist in ensuring timely delivery of each of the deliverables to the PMC by liaising with the project proponents
- Assist in preparing project implementation reports.
- Assist in preparing Project Briefs and other dissemination materials.

### *Qualifications*

- Appropriate University Degree in biodiversity, conservation, natural resources management, environmental management or other relevant majors.
- Relevant Working Experience in Climate Change and GHG emissions, etc.
- Excellent team management skills and strong implementation capabilities.
- Strong communication skills in order to coordinate with government departments, international organizations and research institutions.
- Fluency in English.

### **Terms of Reference for key sub-contracts**

(1) **China's inventory of GHG emissions from the energy sector** - The key purpose is to compile an inventory of greenhouse gas emissions from China's energy activities in 2005, including: GHG emissions from fossil fuel combustion; GHG emissions from biomass energy combustion; CH<sub>4</sub> fugitive emissions from coal mining and post-mining activities; CH<sub>4</sub> fugitive emissions of oil and gas system; relevant uncertainties assessment, plus setting up relevant GHG emissions reporting mechanisms for the energy sector.

### *Tasks*

- Collection and identification of the data of activity levels on fossil fuel combustion by sectors and devices, biomass energy combustion, coal mining and post-mining, and the process of CH<sub>4</sub> fugitive emission in oil and gas system.
- Collection and determination of the carbon and energy content, carbon oxidation ratio and Nitrous Oxide (N<sub>2</sub>O) and CH<sub>4</sub> emission factors by fuel types and technologies; N<sub>2</sub>O and CH<sub>4</sub> emission factors of various types of biomass energy and combustion technologies; CH<sub>4</sub> emission factors of coal mining and post-mining activities in line with IPCC Tier 3 and 2 approaches; identification of the volume of gas drainage and utilization from coal mining activities (coal mining, processing and transportation etc.) in China; and evaluation of CH<sub>4</sub> fugitive emission factor in oil and gas system.
- Compilation of the China 2005 GHG emission inventory from energy sub-sectors, including: fossil fuel combustion; biomass energy combustion; CH<sub>4</sub> emission inventory of coal-mining and post-mining activities, and CH<sub>4</sub> fugitive emission inventory of oil and gas system.
- Preparation of the inventory compiling methodology for GHG emission inventory of energy sector.
- Compilation of China's 2005 GHG emission inventory of energy activities.

### *Outputs*

- Data of activity levels pertinent to China's energy activities.
- GHG emission factors for each source category of energy activities in China.
- China's GHG inventory of energy sector in 2005

### *Qualifications*

- Well versed with the UNFCCC and IPCC guidelines/good practices for Greenhouse Gas Inventories and National Communications.

- Prior experience in compiling national inventories of energy activities, especially involving in GHG inventory for China's Initial National Communication on Climate Change.
- Long- Term deep engagement in researches of energy activities.
- Strong skills in data collection and database development.
- An extensive cooperating network with government agencies, research institutes, enterprises and associations plus industrial experts, which will facilitate the smooth implementation.

(2) **China's inventory of GHG emissions from industrial processes** - The key purpose is to compile an inventory of greenhouse gas emissions from China's industrial processes, including: carbon dioxide (CO<sub>2</sub>) emissions from cement production; CO<sub>2</sub> emissions from lime production; CO<sub>2</sub> emissions from iron and steel production; CO<sub>2</sub> emissions from calcium carbide production; nitrous oxide (N<sub>2</sub>O) emissions from adipic acid production; N<sub>2</sub>O emissions from nitric acid production; PFC emissions from aluminum production; SF<sub>6</sub> emissions from magnesium production; SF<sub>6</sub> emissions from electrical equipments and other sources; PFC, HFC and SF<sub>6</sub> emissions from semiconductor manufacturing; PFC and HFC emissions from production and use of Substitutes for Ozone Depleting Substances (ODS Substitutes); undertaking quantitative uncertainties assessment; plus setting up relevant GHG emissions reporting mechanisms for the industrial sectors.

### ***Tasks***

- Collection data of activity levels for each source category of the relevant industrial processes in China in 2005, including: cement production, lime production, iron and steel production, calcium carbide production, adipic acid production, nitric acid production, aluminum production, magnesium production, electrical equipments and other sources, semiconductor manufacturing, and use of Ozone Depleting Substances (ODS) Substitutes.
- Evaluation of the GHG emission factors for each source category of the relevant industrial processes in China in 2005, including: CO<sub>2</sub> emission factors for cement production, lime production, iron and steel production, calcium carbide production and usage; N<sub>2</sub>O emission factors for adipic acid production and nitric acid production; PFC emission factors for aluminum production; SF<sub>6</sub> emission factors of magnesium production and electrical equipments and other sources; PFC, HFC and SF<sub>6</sub> emission factors of semiconductor manufacturing, and; PFC and HFC emission factors of production and use of ODS Substitutes
- Compilation of the China 2005 GHG emission inventory from those industrial processes as mentioned above.

### ***Outputs***

- Data of activity levels for each source category of the relevant industrial processes
- Evaluation of the GHG emission factors for each source category of the relevant industrial processes
- GHG emission factors for each source category of the relevant industrial processes.
- Inventory of GHG emissions from industrial processes in 2005.

### ***Qualifications***

- Well versed with the UNFCCC and IPCC guidelines/good practices for Greenhouse Gas Inventories and National Communications.
- Prior experience in compiling GHG inventory from industrial processes, especially involving in GHG inventory for China's Initial National Communication on Climate Change.

- Research background in industrial processes, including: cement production, lime production, iron and steel production, calcium carbide production, adipic acid production, nitric acid production, aluminum production, magnesium production, electrical equipments and other sources, semiconductor manufacturing, and use of Ozone Depleting Substances (ODS) Substitutes.
- Strong skills in data collection and database development.
- An extensive cooperating network with government agencies, research institutes, enterprises and associations plus industrial experts, which will facilitate the smooth implementation.

### **(3) China's inventory of GHG emissions from the croplands**

#### ***Tasks***

- Measurements of nitrous oxide emissions from croplands and methane emissions from paddies water-logged in winter (PWLW).
- Data survey of the PWLW acreage and fertilizer nitrogen partitioning into major cropland types.
- Establishment of databases to facilitate estimation of methane and nitrous emissions from croplands at a high spatial resolution, and to support uncertainty analysis.
- Model development to enable inventory compilation with advanced methodologies.
- Inventory compilation by estimating methane and nitrogen oxide emission by cropland categories.
- Uncertainty quantification and assessment for the inventory estimates of methane and nitrogen oxide emissions from croplands.
- Inventory reporting and documentation.

#### ***Outputs***

- Revised methane emission factors from PWLW and nitrous oxide emission factors from croplands.
- Revised activity data and databases facilitating model-estimation of high-resolution spatial emissions of methane and nitrous oxide from paddies and other croplands.
- Improved models capable of estimating methane emission from various categories of paddies and nitrous oxide emissions from the major types of croplands in China.
- Inventories of methane emissions from paddies and nitrous oxide emissions from croplands in 2005 and provided uncertainties for the inventory estimates.
- An inventory report and relevant documentations in the form required by UNDP/GEF.

#### ***Qualifications***

- Well versed with the UNFCCC and IPCC guidelines/good practices for Greenhouse Gas Inventories and National Communications.
- Prior experience in compiling national inventories of methane and nitrous oxide emissions from croplands, especially involving in GHG inventory for China's Initial National Communication on Climate Change.
- Long- Term deep engagement in researches of methane and nitrous oxide emissions from croplands, in terms of field measurements, data quality assurance/ quality control (QA/QC) of emission factors, and model development and application.
- Strong skills in data collection and database development.

- An extensive cooperating network with government agencies, research institutes, enterprises and associations plus industrial experts, which will facilitate the smooth implementation of this subcomponent.

(4) **China's inventory of GHG emissions from Livestock Sector** - The key purpose is to prepare an inventory of greenhouse gas emissions for China's livestock and manure management sector.

### *Tasks*

- Data collection and database development on animal related activity data and parameters.
  - Collect data on annually average animal population in stock, handout, population structure
  - Collect data on feed components, feed type, average daily feed intake
  - Collect data on animal productivity: live weight, and milk production
  - Collect data on manure management system usage and ash content of manure, N excretion
  - Database development
- Development of emission factor
  - Field and lab measurement of methane and nitrous oxide emissions from enteric fermentation and manure management systems
  - Determination of methane emission factor on enteric fermentation
  - Determination of methane emission factor on manure management
- Assessment of uncertainties
  - Quantitative uncertainty assessment on CH<sub>4</sub> emissions from enteric fermentation
  - Quantitative uncertainty assessment on CH<sub>4</sub> and N<sub>2</sub>O emissions from manure management
  - Provide quantified analytical results on uncertainty on GHG emissions from livestock sector
- Estimation of GHG emissions from livestock sector
  - Emission estimation and inventory compilation from enteric fermentation
  - Emission estimation and inventory compilation from manure management
- Inventory reporting and documentation.
  - Compile a complete and transparent report for 2005 GHG inventory from livestock, in line with the UNFCCC Guidelines for the preparation of national communications from non-Annex I Parties

### *Outputs*

- Database related to animal production and animal manure management.
- GHG inventory for enteric fermentation.
- GHG inventory for manure management system.

### *Qualifications*

- Well versed with the UNFCCC and IPCC guidelines/good practices for Greenhouse Gas Inventories and National Communications.
- Prior experience in compiling national inventories from livestock sector, especially involving in GHG inventory for China's Initial National Communication on Climate Change.
- Prior experiences in GHG inventory study on livestock production and manure management.
- Strong skills in data collection and database development.
- Key technical support organization of the Chinese Government on climate change.
- Extensive network for communications with livestock sectors, climate change research organizations and experts in livestock sectors to ensure a high quality national communication.

(5) **China's inventory of GHG emissions from LUCF Sector** - The key purpose is to prepare GHG inventory of land use change and forestry (LUCF) sector in 2005, in accordance with the *IPCC guidelines*.

### **Tasks**

- Develop estimate of changes in forest and other woody biomass stocks in 2005
- Collect and update data of forests and other woodland, for different age classes, major forest types and trees outside forests.
- Determine and update parameters for accounting of carbon stock changes in forest and other woody biomass by literature review and supplementary field measurement
- Determine the annual variability of forest growth
- GHG emissions from forest conversion
- Collect and update data on area of forest conversion (deforestation)
- Update and determine emission factors of CO<sub>2</sub> and non-CO<sub>2</sub> emissions due to forest conversion and develop relevant database.
- Changes in soil organic carbon
- Collect and update activity data on cropland and grassland, for major cropping systems, agricultural activities, grassland types and management practices
- Supplementary collect and measure parameters on soil organic carbon change, for major cropping systems, agricultural activities, grassland types and management practices, major forest types and forestry activities
- Modify and validate the Agro-C model against independent data from field measurements.

### **Outputs**

- Estimate of GHG inventory in LUCF Sector in 2005

### **Qualifications**

- Long- Term experiences involving IPCC activities of LUCF, knowledgeable to IPCC GHG inventory methodologies in LUCF sector.
- Knowledge of UNFCCC Articles and experiences involving UNFCCC activities relevant to LUCF.
- Prior experience in compiling national inventories from LUCF sector, especially involving in GHG inventory for China's Initial National Communication on Climate Change.
- Research background in field measurement and modeling uptake and release of carbon in the LUCF sector.
- Strong skills in data collection and database development in LUCF sector.
- Accessible to authoritative data in forestry sector.
- Preferable available database.
- Extensive network for communications with terrestrial ecosystem and climate change research organizations and experts in various sectors to ensure a high quality inventory by having more participation from organizations and experts.

(6) **China's inventory of GHG emissions from wastewater / sewage treatment** - Waste mainly including solid waste, industries and residential wastewater in this project. According to the methods of data collection, collation, analysis and calculation, we confirm GHG emission factors and activity



levels, then, calculate the China's GHG emission amount from waste and complete uncertainties analysis.

### ***Tasks and Outputs***

Completing China's Greenhouse Gases emission inventory from the waste sector, including:

- China's methane emission inventory from landfills.
- China's carbon dioxide emission inventory from waste incineration.
- China's methane emission inventory from industrial wastewater treatment and methane emission inventory from domestic wastewater treatment.
- China's nitrous oxide emission inventory from wastewater / sewage treatment.

### ***Qualification***

- Well versed with the UNFCCC and IPCC guidelines/good practices for Greenhouse Gas Inventories and National Communications.
- Prior experience in compiling national inventories from wastewater / sewage treatment, especially involving in GHG inventory for China's Initial National Communication on Climate Change.
- Research background in landfill, waste incineration, industrial wastewater treatment, domestic wastewater treatment and wastewater / sewage treatment etc.
- Strong skills in data collection and database development.
- An extensive cooperating network with government agencies, research institutes, enterprises and associations plus industrial experts, which will facilitate the smooth implementation.

(7) **China's GHG inventory database** - The key purpose is to set up China's GHG Inventory Database (main database) for storing and retrieving information such as emission amount of each source, emission factors, activity and other relevant data, which will serve as an effective tool for the inventory compilation, inventory information analysis and management.

### ***Tasks***

- Propose the basic requirements for China's GHG Inventory Information Management System framework.; design and propose the framework structure of China GHG Inventory Information Management System.
- Propose the information requirements for the energy, industrial process, agriculture, land use change and forestry and waste sub-databases.
- Complete system design including the design for system structure, data structure, interface, data port, index and analysis functions and system maintenance.
- Data Processing; System Development; System Debugging; Routine operation, maintenance and data updating; Training and workshops, etc.
- Prepare the technical report, operation and maintenance manual and project implementation report of the Inventory Database.

### ***Outputs***

- Basic framework of China's GHG inventory information management system.

- Information requirements for each sub-database.
- Structure design of the main database of China's GHG Inventory Database.
- China's GHG Inventory Database.

### ***Qualifications***

- Ability to develop database and information management system.
- Familiar with the UNFCCC Greenhouse Gas Inventory Data and the IPCC Database on GHG Emission Factors.
- Rich experience in developing database management system, especially on the database relating to national emissions inventory.

(8) **China's GHG Emission Forecast Methodology** - Emission forecast is one component of National Communication. National Communication submitted by developed countries basically includes emission forecast for next 20 years. This gives the picture for future emission trend, normally given as emission forecast in business as usual forecast (BaU). Based on the UNFCCC decision, the national communication submitted by Annex I countries may not include emission forecast part, due to weak ability on modeling to make the forecast. The Initial National Communication submitted by Chinese Government in 2005 did not include emission forecast. However because China is one of large emission countries, it is necessary to provide foresight for future emission in China. In order to raise the capacity to make forecast on emission to be used in the official document to UNFCCC, it is essential to include the activities in this proposal to help Chinese researcher and modeler to make emission forecast.

### ***Tasks***

General task: provide preliminary methodology and results for China's GHG Emission Forecast Analysis.

- Assess existing results for GHG emission forecast on China from both domestic studies and international studies; compare different methodologies, model parameters, assumptions, to understand the impact from these factors on the results.
- Based on the experience from developed countries, and domestic modeling research work and Chinese situation, develop and extend modeling system, to have a suitable modeling tool for China's GHG emission analysis and forecast.
- Develop and improve data support system for China's national GHG emission forecast.
- Make forecast for GHG emission in China up to 2020 by using the modeling system.

### ***Outputs***

- Review and assessment report on GHG emission forecast in Annex I countries.
- Modeling system for China's GHG Emission analysis and forecast.
- Data support system for China's national GHG emission forecast.
- China's GHG emission forecast in 2020.

### ***Qualifications***

- Ability to analyze whole process of emissions including energy activities, land use, industrial process, etc.

- Rich experience in energy and emission scenario and policy options assessment.
- Rich experience in modeling work.
- Prior experience in compiling China's GHG inventory.
- Plenty of experts with an advanced degree and research experience in climate change.

(9) **Assessment on impact of, vulnerability and adaptation to climate change** - The key purpose is to prepare of an assessment report on the latest progress of China's vulnerability to the threats of climate change as evidenced by the current (observed) and predicted impacts in five of its important socio-economic and resource sectors: agriculture, water resources, coastal resources, terrestrial ecosystems and human health. The tasks associated with this work are listed below, followed by an estimated budget breakdown and listing of required qualifications.

### ***Tasks***

- Describe recent climate change and future climate change trends in China:
  - Describe historical climate change in China.
  - Use appropriate methodologies and guidelines to analysis China's future trends of climate change, including changes in the frequency and intensity of climate extremes.
- Assess the impacts of climate change on China's food production and associated vulnerability
  - Review the assessment results related to the impact of, and vulnerability and adaptation to climate change.
  - Assess climate change impacts on crop yields and food production caused by climate change.
  - Establish an adaptation option matrix for agriculture; establish an index system to assess the vulnerability; project the extent of vulnerability of China's agriculture to climate change;
- Provide impact assessment report about climate change on water resources and its vulnerability
  - Summarize research progress about impacts of climate change on water resource and its vulnerability and adaptation.
  - Evaluate the observed effects of climate change on the water resources; analyze the sensitivity of runoff to variability of precipitation and air temperature in China's seven large river basins; assess vulnerability of water resources to climate change; evaluate adaptation measures in flood, drought and shortage of China's water resources under different scenarios.
  - Impact assessments of climate change on water supply and demand.
- Provide assessment report on impact of and vulnerability to climate change on forest and other natural ecosystems
  - Review the progress of the impact of climate change on natural ecosystems.
  - Assess the impact of climate change on structure and function of natural ecosystems; assess the impact of climate change on forest fire and pests/diseases; and assess impacts of climate change on biodiversity.
  - Assess vulnerability and adaptation of China's forests and grassland ecosystems to climate change.
- Provide assessment report about climate change impact on sea-level rise and the coastal social economy, and of vulnerability
  - Collect relevant research literature and references on sea-level rise; review of relevant researches regarding the impacts of climate change on sea-level rise.
  - Assess impact assessment of climate change on sea-level rise and the coastal social economy, assess the effect of climate change and sea-level rise on mangrove and coral reef.
  - Assess the vulnerability and adaptability of coastal area to climate change and sea-level rise; make recommendations on measures in response to climate change and sea-level rise.
- Impact of climate change on human health

- Collect references on impact of climate change on human health, and review the research advances on impact of climate change on human health.
- Identify different types of diseases sensitive to climate change, and predict the sensitive regions for disease outbreak and prevalence affected by climate change.
- Assess the impact of climate change on human health.
- Provide comprehensive assessment report about climate change impacts, vulnerability and adaptation
- Prepare a comprehensive assessment report on climate change impacts, on agriculture, water resources, natural ecosystems, coastal zones and human health, and vulnerability and adaptation
- Analyze the vulnerability of these systems to climate change and possible adaptation measures; to compile an assessment report in accordance with the SNC requirements.
- Adaptation policies and measures.
  - Collect information on major plans, policies and projects related to China's efforts on tackling climate change.
  - Analyze the impact of these measures on enhancing the adaptation capability to address climate change.
  - Explore ways to integrate adaptation policies into national programs for sustainable development.

### ***Outputs***

- Characteristics of climate change and analysis of future trends in China.
- Integrated assessment report about climate change impacts, vulnerability and adaptation on agriculture, water resources, coastal resources, terrestrial ecosystems and human health.

### ***Qualifications***

- Extensive experience in impacts of, vulnerability and adaptation to climate change in the field of agriculture, water resources, coastal resources, terrestrial ecosystems and human health.
- Extensive experience in analyzing current climate change and future climate scenarios.
- Strong skills in data collection and model development.
- Extensive experience in IPCC activities related to climate change impacts, vulnerability and adaptation.
- Institutes with rice experience to provide technical support climate change related policy-making.
- Good cooperation with relevant ministries and as key consulting institution of the Chinese Government on climate change.

### **(10) Improving public awareness and informing policy-decision making on climate change**

Awareness-raising activities on GHG inventory focuses on promoting the public awareness of climate change and institutionalized inventory process beyond the national GHG inventories to policymakers.

### ***Tasks***

- Ensure the Sustainability of China Climate Change Info-Net.
  - Improve China Climate Change Info-Net (CCCHINA for short hereafter).
  - Perform the routine operation and maintenance of CCCHINA.
- Compilation and dissemination of publication series on China's efforts to address climate

change.

- Compilation of the summary report on education, training and public awareness improving sub-project.

### ***Outputs***

- Sustainability of China Climate Change Info-Net.
- A series of publications.
- Project report on education, training and public awareness improving.

### ***Qualifications***

- Rich experiences in organization or participation in projects related to public awareness improving and informing sharing on climate change.
- Keep following up the latest move of climate change and GHG emission issues.
- An extensive cooperating network with government agencies, research institutes, enterprises and associations plus industrial experts, which will facilitate the smooth implementation.

**SIGNATURE PAGE**

Country: China

**UNDAF Outcome(s)/Indicator(s):**

By the end of 2010, more efficient management of natural resources and development of environmentally-friendly behaviour to ensure environmental sustainability (with special focus on energy, biodiversity and water resources).

**Expected Outcome(s)/Indicator(s):**

End-use energy efficiency and application of new and renewable energy technologies improved.

**Expected Output(s)/Indicator(s):**

Energy Consumption per unit GDP decreased.

**Implementing Partner:**

National Development and Reform Commission

(designated institution/Executing agency)

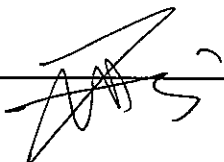
**Other Partners:**

Programme Period: 2007-2013  
Programme Component: Energy and Environment  
Project Title: PIMS 2962 Enabling China to Prepare Its Second National Communication on Climate Change under the UNFCCC  
Project ID: 00054162 (CHN10)  
Award ID: 00045777 (CHN10)  
Project Duration: 4 Years  
Management Arrangement: NEX

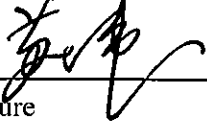
Total budget: US\$ 5,650,000  
Allocated resources:  
• Government (In-Kind) US\$ 650,000  
 GEF US\$ 5,000,000  
 Donor \_\_\_\_\_  
 Donor \_\_\_\_\_

**Agreed by:**

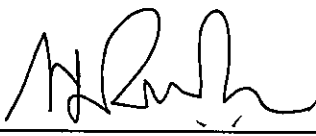
**Government of People's Republic of China**

Signature  Date \_\_\_\_\_ Title \_\_\_\_\_

**National Development and Reform Commission, China(NDRC)**

Signature  Date 2008.9.28 Title \_\_\_\_\_

**UNDP**

Signature  Date \_\_\_\_\_ Title \_\_\_\_\_