



**GEF**

**Mohamed T. El-Ashry**

*Chief Executive Officer  
and Chairman*

## **Global Environment Facility**

1818 H Street, NW  
Washington, DC 20433 USA  
Tel: 202.473.3202  
Fax: 202.522.3240/3245  
Email: melashry@worldbank.org

May 15, 2001

Dear Council Member,

The UNDP, as the Implementing Agency for the project, *China: Enabling China to Prepare Initial National Communication to the UNFCCC*, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with UNDP procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by the Council in May 2000 and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by the UNDP satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at [www.gefweb.org](http://www.gefweb.org). If you do not have access to the Web, you may request the local field office of the UNDP to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

cc: Alternate, Implementing Agencies, STAP



United Nations Development Programme  
GLOBAL ENVIRONMENT FACILITY (GEF)



1 February 2001

Dear Mr. El-Ashry,

Subject: CPR/99/G31/A/1G/99 – Enabling China to Prepare  
Its Initial National Communication (ECPINC)

I am pleased to enclose the proposal for China entitled “**Enabling China to Prepare Its Initial National Communication (ECPINC)**” which was approved by the GEF Executive Council in May 2000. The response to comments from Council Members is also attached and these comments have been addressed in the project document.

As per paragraph 29 and 30 of the GEF Project Cycle, we are submitting this project to you for circulation to the Executive Council Members for comments and, subsequently, for your final endorsement.

Thank you in advance for expediting the review and approval of this project.

Yours sincerely,

  
Rafael Asenjo  
Executive Coordinator

Mr. Mohamed El-Ashry  
Chief Executive Officer  
Global Environment Facility  
Room G6005  
1776 G Street  
Washington, D.C. 20433  
PM

**Comments by GEF Council Members  
(REFERENCE TO GEF/C.15/3 – April 7, 2000 )**

**Enabling China to Prepare Its Initial National Communication (ECPINC)**

(UNDP: \$3.5 million)

**I. Comments by STAP**

ISSUE	RESPONSE: REFERENCE IN PROJECT DOCUMENT
<i>STAP Reviewer Comments on Project Brief</i>	Reflected as appropriate in Project Brief prior to GEF Bilateral and GEF Council approval of project brief.

**II. Comments by World Bank**

ISSUE	RESPONSE: REFERENCE IN PROJECT DOCUMENT
<i>World Bank Comments on Project Brief</i>	Reflected as appropriate in Project Brief prior to GEF Bilateral and GEF Council approval of project brief.

**III. Comments by UNDP**

ISSUE	RESPONSE: REFERENCE IN PROJECT DOCUMENT
<i>UNDP Comments on Project Brief/Project Document</i>	Issues raised in the China office Local Project Appraisal Committees (LPAC ) have been reflected as appropriate in finalized Project Document. UNDP HQ comments have also been incorporated.

**IV Comments by GEF Council Members**

Issue and Response	REFERENCE IN PROJECT DOCUMENT
<p><u><i>Comments from the Constituency of Australia, New Zealand and Republic of Korea:</i></u></p> <p>Support GEF assistance to this project as a high priority.</p> <p>Welcome China's activity in this area, particularly the intention to refine inventories as the basis for greenhouse mitigation efforts.</p> <p>General comments</p> <p>China is a key developing country in the context of the UNFCCC and the Kyoto Protocol.</p> <p>GEF funding for this project should be encouraged, as a decision of the Conference of the Parties to the UNFCCC requires that the GEF provide financial assistance to developing countries for the preparation of such initial communications on the request of the country.</p> <p>Establishing sound inventories is key to enabling countries to be in a position to address climate change.</p> <p>This project should also be useful in terms of replicability for other developing countries.</p>	Throughout.
<p><u><i>Comments from France:</i></u></p> <p>Country programs provide an indispensable foundation for carbon savings. Following are a number of suggestions to facilitate communication with <i>local decision-makers (political officials and industry decision-makers) and to</i></p>	

*ensure that the recommended measures are taken into account in these country programs.*

Summary tables comprehensible to persons unfamiliar with the situation should be prepared. They should include data on current emissions and the principal resources to be developed, and should compare these data with other reference data. The series of priority measures recommended to develop the resources and the proposed implementation modalities could also be included in the summary. It would also be useful to receive the authorities' views regarding the recommendations.

It would also be helpful to monitor developments in the various sectors (including variation and trend analyses) and to periodically evaluate progress made in implementing the recommendations.

This would make it possible to derive maximum benefit from these capacity-building efforts and facilitate data processing by the economic actors for operational purposes.

Activity 7.1.3

# UNITED NATIONS DEVELOPMENT PROGRAMME

## *Project of the Government of The People's Republic of China*

### GEF PROJECT DOCUMENT

Project No.: CPR/00/G31/A/1G/99  
 Project Title: Enabling China to Prepare Its  
 Initial National Communication  
 (ECPINC)

Duration: 2 Years and 4 Months

Estimated Start Date: January 2001

Estimated End Date: May 2003

Managt. Arrangement: National Execution

Designated Institution: State Development  
 Planning Commission (SDPC)

Project Sites: Beijing and Provinces

<u>UNDP and Co-Financing</u>	
UNDP/GEF:	\$ 3,500,000
Gov't. Co-financing:	\$ 240,000 (in kind)
<b>Total:</b>	<b>\$ 3,740,000</b>

Classification Information:

**ACC sector and sub-sector:** Environment (20) / Environment Assessment and  
 Monitoring (20)

**DCAS sector and sub-sector:** Energy (008) / Sector Policy and Planning (046)

**Primary areas of focus/sub-focus:** Environmental Resources (03) / Promotion of Sustainable  
 and Atmospheric Quality (20)

**Primary type of intervention:** Institution Building (01)

**Primary target beneficiaries:** Group: Target Organization (02), TB Code: Govt.  
 Organizations (038)

**Secondary target beneficiaries:** Group: Target Group (01), TB Code: Population at large  
 (036)

Brief Description: This project will enable China to fulfill its commitments under the United Nations Framework Convention on Climate Change (UNFCCC) to communicate to the Conference of Parties to the Convention: (i) a national inventory of emissions and sinks of greenhouse gases, (ii) a general description of steps taken or envisaged by China to implement the Convention, and (iii) any other information China considers relevant and suitable for inclusion in its Communication. In addition, the project will enable China to strengthen and expand its activities for increasing public and political awareness and action related to climate change. Together, the various components of the project should serve to strengthen climate change related capacity in China that will prove beneficial beyond submission of the Initial National Communication. The greatest emphasis of the project will be in the area of building capacity, collecting data, and conducting analysis for the national inventory to be included in the National Communication. Future national communications from China will benefit from the improved methodologies developed during the inventory work for this first communication. Sectors to be covered in the inventory work will include: (1) energy, (2) industrial processes, (3) agriculture, (4) forestry, and (5) municipal waste.

On behalf of	Signature	Date	Name/Title
The Government	-----	-----	-----
Designated Institution	-----	-----	-----
UNDP	-----	-----	-----

UN official exchange rate at date of signature: US\$1.00 = RMB 8.266

## TABLE OF CONTENTS

<b>A</b>	<b>CONTEXT</b> .....	<b>1</b>
A.1	Description of Sub-sector .....	1
A.2	Host Country Strategy.....	2
A.3	Prior or Ongoing Assistance .....	2
A.4	Institutional Framework for Sub-sector .....	5
<b>B</b>	<b>PROJECT JUSTIFICATION</b> .....	<b>6</b>
B.1	Problems to be addressed: The Present Situation .....	6
B.2	Expected End of Project Situation .....	7
B.3	Target Beneficiaries.....	8
B.4	Project Strategy and Implementation Arrangements .....	8
B.5	Reasons for Assistance from UNDP .....	9
B.6	Special Considerations.....	10
B.7	Coordination Arrangements .....	10
B.8	Counterpart Support Capacity .....	10
<b>C</b>	<b>DEVELOPMENT OBJECTIVE</b> .....	<b>11</b>
<b>D</b>	<b>IMMEDIATE OBJECTIVES, OUTPUTS AND ACTIVITIES</b> .....	<b>11</b>
Immediate Objective 1:	Preparation of Energy Sector Inventory .....	11
Immediate Objective 2:	Preparation of Industrial Processes Inventory .....	12
Immediate Objective 3:	Preparation of Agricultural Sector Inventory .....	13
Immediate Objective 4:	Preparation of Forestry Sector Inventory.....	15
Immediate Objective 5:	Preparation of Municipal Waste Sector Inventory .....	16

<b>Immediate Objective 6: Drafting of Initial National Communication and Incorporation into Development Strategies and Processes .....</b>	<b>17</b>
<b>Immediate Objective 7: Increased Public and Political Awareness and Action Related to Climate Change .....</b>	<b>18</b>
<b>E INPUTS .....</b>	<b>19</b>
<b>1. UNDP/GEF Inputs by Project Component .....</b>	<b>19</b>
<b>2. Government/Domestic Input.....</b>	<b>21</b>
<b>F RISKS .....</b>	<b>21</b>
<b>G PRIOR OBLIGATIONS AND PREREQUISITES .....</b>	<b>22</b>
<b>H PROJECT REVIEWS, REPORTING, AND EVALUATION .....</b>	<b>22</b>
<b>I LEGAL CONTEXT .....</b>	<b>22</b>
<b>J BUDGET .....</b>	<b>23</b>
<b>J.1 Budget for Government Co-financing .....</b>	<b>23</b>
<b>J.2 Budget for UNDP/GEF Contribution (UNDP FIM Format).....</b>	<b>23</b>
<b>Annex 1: Work Plan.....</b>	<b>24</b>
<b>Annex 2: Outline Terms of Reference for Subcontracts* finalise at prodoc signature.....</b>	<b>29</b>
<b>Annex 3: Terms of Reference for National Professionals and International Consultants *finalise at prodoc signature .....</b>	<b>35</b>
<b>Annex 4: Terms of Reference for Overseas Training * finalise at prodoc signature .....</b>	<b>38</b>
<b>Annex 5: Equipment List *finalise at prodoc signature .....</b>	<b>40</b>
<b>Annex 6: Overview of China's GHG Emissions and Vulnerability to Climate Change.....</b>	<b>41</b>
<b>Annex 7: Decision 10 of the Second Conference of the Parties (COP 2) to the UNFCCC.....</b>	<b>44</b>
<b>Annex 8: Guidelines for the Preparation of Initial Communication by Parties not Included in Annex I to the Convention.....</b>	<b>46</b>

<b>Annex 9: Revised Project Planning Matrix.....</b>	<b>52</b>
<b>Annex 10: Incremental Cost Matrix .....</b>	<b>53</b>



## Acronyms

ADB	Asian Development Bank
ALGAS	Asian Least-Cost GHG Abatement Strategy
APR	Annual Performance Review
CAS	Chinese Academy of Sciences
CICETE	China International Center for Economic and Technical Exchange
CH <sub>4</sub>	Methane
CMA	China Meteorological Administration
CO <sub>2</sub>	carbon dioxide
COP	Conference of the Parties to the UNFCCC
ENSO	El Nino Southern Oscillation
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHG	Greenhouse Gas
IPCC	Inter-Governmental Panel on Climate Change
MEEFL	Model for Methane Emissions from Enteric Fermentation of Livestock
MERP	Model for Methane Emissions from Rice Paddies
MOST	Ministry of Science and Technology
N <sub>2</sub> O	Nitrous Oxide
NPD	National Project Director
OECD	Organization for Economic Cooperation and Development
PDF	Project Development Funds
RMB	Renminbi
SDPC	State Development Planning Commission
SEPA	State Environmental Protection Administration

SETC	State Economic and Trade Commission
TOR	Terms of Reference
TPR	Tripartite Review
UNDP	United Nations Development Programme
UNFCC	United Nations Framework Convention on Climate Change
US DOE	US Department of Energy

## A Context

### A.1 Description of Sub-sector

It is now widely accepted in the international community that global climate change resulting from anthropogenic emissions of greenhouse gases may pose a major threat to nations around the world. Human activities that are most significant in terms of their contributions to greenhouse gas emissions include those in the energy sector (which account for greatest total sector contribution to greenhouse gas emissions), industrial processes, agriculture, land use, forestry (which can serve as a sink for as well as a source of greenhouse gas emissions), and the municipal waste sector. Among the postulated negative impacts of climate change are a decrease in agricultural productivity, an increase in natural disasters, and a loss of low-lying coastal areas and islands to rising sea levels.

As a first step towards addressing the threat of climate change, the international community has developed the United Nations Framework Convention on Climate Change (UNFCCC). The Convention underscores the importance of carrying out work in a number of areas to address the climate change issue: current emissions must be understood; potential impacts should be evaluated; adaptation measures should be formulated; and, finally, steps must be taken to limit total global emissions of greenhouse gases. The Convention emphasizes that the responsibilities of developed countries and developing countries in these endeavors should be different. The largest share of historical and current emissions is due to the developed countries; and the developing countries' share of global emissions will need to grow to meet their development needs.

Climate change could potentially have major impacts on China; and, conversely, China's greenhouse gas emissions could have major implications for the world's climate. China's potential vulnerability to climate change and its greenhouse gas emissions are described in greater detail in Annex 7, with only a brief introduction given here. Given its many different climates and ecosystems, China could suffer a wide range of varying impacts due to climate change. The nation is already burdened with a range of climate- and natural disaster-related problems that could be exacerbated by climate change. These problems include droughts, floods, and coastal inundation from storm surges. Also of great concern are the potential negative impacts of climate change on agriculture, which are of special interest given that rural residents make up 70% of China's total population. At the same time as it faces the risk of these negative impacts from climate change, China's greenhouse gas emissions, with its large population and rapidly growing economy, are projected to continue to increase.

The UNFCCC sets out general obligations of parties to the Convention; and these obligations have been and will continue to be elaborated upon in subsequent Conferences of the Parties. The Kyoto Protocol, adopted at the Third Conference of the Parties (COP 3), for example, commits developed countries to legally-binding targets to limit or reduce their greenhouse gas emissions. In light of the concept of "differentiated responsibilities", however, no emission targets have been set for developing countries, such as China.

The major concrete commitment to date for the developing countries, also an obligation for the developed countries, is submission of "National Communications." As the only major requirement to date for the developing countries, successful preparation of the National Communications by them is a crucial measure of successful implementation of the Convention.

During COP 2, guidelines for the preparation of Initial National Communications by developing countries were adopted. These are outlined in Decision 10 of COP 2, which is provided as Annex 8 in this document. In summary, the scope of the Initial National Communications submitted by developing countries is to include: (1) a national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, (2) a general description of steps taken or envisaged by the Party to implement the Convention, and (3) any other information that the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its communication. The inventory is to focus on the greenhouse gases carbon dioxide, methane, and nitrous oxide and to cover the energy sector, industrial processes, agriculture, land use change and forestry, and other relevant sources. According to the Convention, the Initial National Communication of a developing country is to be submitted within three years of the availability of financial resources for its preparation.

## **A.2 Host Country Strategy**

The Chinese Government views climate change as a major threat to its ability to achieve sustainable development through implementation of its priority policies, which include poverty eradication, enhancement of food security, and economic development. As such, the Government attaches great importance to climate change issues and signed the UNFCCC in 1992. In the same year, the Convention was ratified by the Standing Committee of the Chinese National People's Congress; and China thus became one of the first countries to ratify the UNFCCC. China is committed to developing policies to address global climate change concerns.

As one of the Non-Annex I Parties to the Convention, the Chinese government endorses the principle of "common but differentiated responsibilities" put forward by the Convention as a basic prerequisite. China takes part actively in the Conference of Parties to the Convention and takes great effort to comply with relevant obligations under the UNFCCC, including the submission of an Initial National Communication within three years after financial resources are provided. China has already been implementing work related to its first National Communication since June 1999.

Other significant actions taken by China in order to fulfill the requirements of the UNFCCC and address issues of climate change include the strengthening of research on (1) the science of the climate system and climatic change, (2) greenhouse gas emissions and the national inventory, (3) impacts on social and economic development, and (4) response strategies. China has also established a high-level cross-ministerial body, the National Coordinating Committee on Climate Change Policy, to address policy issues. Finally, China has already made contributions to alleviating the longer-term trends of climate change by such national measures and "win-win" strategies as population control, energy conservation, and large-scale Afforestation.

## **A.3 Prior or Ongoing Assistance**

China has already implemented or is in the process of implementing a number of foreign assistance projects related to climate change. These projects include work on China's greenhouse gas (GHG) emissions inventory, studies on vulnerability and adaptation, and reduction of emissions from the energy sector.

### **China's Greenhouse Gas Emissions Inventory**

Since 1992, four internationally supported studies on climate change that have addressed China's greenhouse gas emissions inventory have been conducted for research purposes. In each case, the projects were cooperative endeavors between the Chinese Government, relevant Chinese research institutes, and multilateral organizations or countries. The four studies, which estimated China's GHG emissions with varying degrees of effort, are listed below:

- *Response Strategy on Global Climate Change in China*, supported by ADB and completed in 1993
- *China: Issues and Options in GHG Emissions Control*, supported by the GEF and UNDP (executed by World Bank) and completed in 1994
- *China Climate Change Country Study*, supported by the U.S. Department of Energy under its Country Studies Program and completed in 1998
- *Asian Least-Cost GHG Abatement Strategy (ALGAS)*, funded by GEF/UNDP, executed by ADB, and completed in 1998

The data and methodology used for the inventory work in these studies improved over time. The first two Studies used the 1991 OECD methodology, which was later adopted by the Inter-Governmental Panel on Climate Change (IPCC), for estimating emissions sources and sinks. The U.S.-supported *China Climate Change Country Study* was

the first attempt to prepare a preliminary inventory using the 1995, and in some sectors the revised 1996, IPCC methodology. The last study, *ALGAS*, made small improvements over the *China Climate Change Country Study*.

A summary of the inventory work associated with each of the four projects discussed above is given in the table on the following page. It should be noted that the results of the four inventories are very different and are not considered official.

**Table 1. Summary Information on Previous Inventory Work**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Title of the general project or the name of report or publication</b>	Response Strategy on Global Climate Change in China	China: Issues and Options in Greenhouse Gas Control	China Climate Change Country Study	Asian Least Cost GHGs Abatement Strategy
<b>Title of the inventory</b>	Current Emissions of GHGs	Estimation of GHGs Emissions and Sinks in China, 1990	Preliminary Compilation of GHG Emission Inventories	GHG Inventory by Sectors
<b>Sponsor</b>	ADB	GEF	US DOE	ADB
<b>Performer</b>	Energy Research Institute	Design and Research Institute of Environmental Engineering, Tsinghua University	Energy Research Institute	Energy Research Institute
<b>Year of inventory</b>	1990	1985-1990	1990	1990
<b>GHGs</b>	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O	CO <sub>2</sub> , CH <sub>4</sub>	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O
<b>Year of completion</b>	1993	1994	1998	1998
<b>Emission estimates:</b>				
All energy				
Fuel combustion	609.2 Mt-C	667.64 Mt-C, 1.8-2.6 Mt- CH <sub>4</sub>	559.56 Mt-C, 2.97 Mt- CH <sub>4</sub>	559.6 Mt-C, 2.97 Mt- CH <sub>4</sub>
Fugitive fuel emission				
Oil and gas	0.4 Mt- CH <sub>4</sub>	0.179 Mt- CH <sub>4</sub>	0.092 Mt- CH <sub>4</sub>	0.092 Mt- CH <sub>4</sub>
Coal mining	5.3 Mt- CH <sub>4</sub>	18.45 Mt- CH <sub>4</sub>	8.689 Mt- CH <sub>4</sub>	8.78 Mt- CH <sub>4</sub>
Industrial processes	25.5 Mt-C	28.29 Mt-C	22 Mt-C	25.59 Mt-C
Agriculture	20.5 Mt- CH <sub>4</sub>	20.841 Mt- CH <sub>4</sub>	18.2 Mt- CH <sub>4</sub>	12.59-20.09 Mt- CH <sub>4</sub>
LUC and forestry	x	42.53 Mt-C	-86 Mt-C	-75.93 Mt-C
Waste	0.6 Mt- CH <sub>4</sub>	0.792 Mt- CH <sub>4</sub>	2.5 Mt- CH <sub>4</sub>	0.899 Mt- CH <sub>4</sub>

### Vulnerability and Adaptation

Some national research projects relevant to the impacts of climate change have been performed in China over the last ten years, including projects involving international collaboration and support. From 1991 to 1995, for example, the Chinese State Science and Technology Commission conducted a research program entitled *Global Climate Change Prediction, Impacts, and Strategies Study*. In addition, *Response Strategy on Global Climate Change in China* and the U.S. Country Studies Program, both of which are mentioned in the above section on GHG emissions inventories, included work on the impacts of climate change. Previous work, however, cannot meet the full vulnerability/adaptation related requirements of preparing the Initial National Communication, though it can provide some useful information to the endeavor. Further research in vulnerability and adaptation needs to be done in order to prepare a high quality National Communication.

### Energy-Related Projects

There are several ongoing or recently completed GEF projects in China that relate to the energy sector, addressing the climate change issue through their aim to reduce GHG emissions. For many of these, UNDP is the implementing agency. Of particular note, the coal-bed methane project and the landfill methane recovery project, in addition to their promotion of the reduction of GHG emissions, are of added significance to climate change in that they should yield some data relevant to computing GHG emissions. Projects in renewable energy and energy efficiency, in addition to promoting reduction of GHG emissions, may also contribute to increased capacity for data collection and analysis that could eventually benefit GHG emissions inventory work.

### PDF Work

PDF work in support of the project described in this document was conducted during the eight months prior to the project's appraisal period. PDF activities included substantial work related to the preparation of China's Initial National Communication. In particular, work was done in identifying the gaps in previous inventory work and in defining the steps needed to develop more accurate inventories for key greenhouse gas emitting sectors. The Convention calls for each developing country party (with the exception of least developed countries) to submit its initial national communication within three years of the availability of financial resources. Thus, following approval of this project, China will have a total of two years and four months remaining in which to complete its Initial Communication.

### Proposed Concurrent Project

A GEF project closely related to that described in this document (and initially developed as a part of the same process, using the same PDF B funds) is currently being developed. The project will serve to strengthen China's capacity to manage climate change and to meet its commitments to the UNFCCC, building China's capacity in two areas: (1) estimation, monitoring, and verification of GHG emissions and (2) targeted research on vulnerability and adaptation to climate change. The first component has been approved in November 2000 GEF Council meeting covering inventory establishment. The second component will be submitted to GEF for review. The project will provide a more solid base for future national communications to the UNFCCC and for overall implementation of the Convention. In addition, results will be disseminated to other developing countries, providing useful background for their own climate change work.

## **A.4 Institutional Framework for Sub-sector**

China has established an inter-ministerial working group to coordinate national activities relating to climate change. This group, called the National Coordination Committee on Climate Change Policy, has 14 members and is charged with overseeing all activities related to climate change in China. Its members include ministerial officials from the following organizations: the State Development and Planning Commission (SDPC), the State Economic and Trade Commission (SETC), the Ministry of Science and Technology (MOST), the China Meteorological Administration (CMA), the State Environment Protection Administration (SEPA), the Ministry of Foreign Affairs, the Ministry of Finance, the Ministry of Construction, the Ministry of Transportation, the Ministry of Water Resources, the Ministry of Agriculture, the State Forestry Administration, the Chinese Academy of Sciences (CAS), and the State Oceanic Administration. The Committee is chaired by the SDPC, which is responsible for coordinating the Committee's activities. In order to facilitate these activities, the SDPC has established an Office, which serves as secretariat to the Committee. The Committee will be responsible for submitting the National Communication to the State Council for approval.

A project Steering Committee, which will provide guidance for the preparation of the Initial National Communication, has been established. The members of the Steering Committee are officials from the SDPC, Ministry of Foreign Affairs, Ministry of Science and Technology, Ministry of Finance, State Environmental Protection Administration, and China Meteorological Administration.

## **B Project Justification**

### **B.1 Problems to be addressed: The Present Situation**

In order to comply with the UNFCCC, China must prepare its Initial National Communication. A National Communication is required of all signatories to the Convention and, in the case of developing countries, is to include: a national inventory of GHG emissions and sinks, a general description of steps taken or envisaged to implement the Convention, and any other information the party deems relevant to convey. Up to the present, however, only limited progress has been made in China in developing policy related to climate change and in building a body of relevant research results to inform policy decisions and fulfill commitments under the UNFCCC. In particular, China would not be able to prepare an accurate inventory based on past results. Rather, a comprehensive inventory will require collection of a great deal of data from many sites and sectors and the calculation of emission factors (i.e. factors indicating the rate of emission of greenhouse gases from a particular activity given a certain set of parameters), which together may be used to extrapolate a complete inventory. In addition, overall public awareness in China regarding climate change is low.

#### Specific Problems Related to National Inventory

While past climate change studies have included research on a national inventory for China, results to date have major deficiencies in each of the key sectors (energy, industry, agriculture, forestry, and municipal waste) and consequentially vary by over 100% in some sectors. In general, problems include lack of data and of accurate emissions factors. A review of more specific deficiencies, described below on a sector-by-sector basis, clearly indicates that very substantial work will still be needed in order to prepare the inventory required for China's National Communication.

1. Energy: Although the *China Climate Change Country Study* funded by the U.S. Department of Energy attempted to cover all sectors in as much detail as possible, there are several sectors for which it used a top-down methodology and many instances where the IPCC default emissions factors were used, although these may not match true circumstances. In general, work needs to be done so that methodologies incorporate data collection and emissions factors are calculated based on Chinese circumstances. Key areas where the study is deficient in these regards in the energy sector are: (i) coal quality and methane emissions from village and township coal mines; (ii) methane site data and nitrous oxide emission factors for biomass combustion; (iii) coal oxidation rates for industrial boilers and kilns and for cook stoves with very low combustion efficiencies; and (iv) transport fuel use and related emission factors by type of vehicle.

2. Industrial Processes: For the industrial processes sector, earlier inventories reported on CO<sub>2</sub> emissions from cement production only. Much work is needed to collect activity data and investigate and measure emission factors for the production of lime, iron and steel, calcium carbides, and adipic acid. Also, the CO<sub>2</sub> emissions factors for cement production vary by about 35% across previous studies.

3. Agriculture: In the agricultural sector, additional work is needed in the sub-sectors of wetland rice fields, croplands with fertilizer amendment, livestock production and manure management to develop the inventories of GHG emissions with acceptable uncertainties. For methane emissions from wetland rice fields of China, previous estimates, which is ranged from 5 Tg to 13 Tg, mainly relied on a few measurements, which were far not enough to reflect the actual situation in China. To produce an inventory with high certainty, effects of key influencing factors, including water regime, organic and chemical fertilizer types and the manner of their application, and rice cultivars, data of which are not available in agricultural yearbooks or related documents, on methane emission factors must be considered. The situations for methane emission from enteric fermentation as well as methane and nitrous oxide emission from manure management are quite similar as that of methane emission from wetland rice fields while much fewer measured data are available in China. To improve the reliability of future inventory estimates, data on the age structure of the livestock population, feed intake, important parameters of livestock waste management systems, activity levels of livestock sub-categories or waste management systems, and emission factors have to be obtained via investigation or observation. Previous studies did not cover the



estimation of nitrous oxide emissions from agriculture. Although a few field observations have been carried out in China, the existing data on emissions factors from croplands with fertilizer amendments are quite inadequate in representing the complexity of China's agricultural systems. Meanwhile, data on activity levels are still unavailable. Therefore, Survey or field investigation is required to obtain data on emissions factors as well as activity level for the purpose of developing a reliable inventory for this sub-sector.

**4. Forestry:** Past estimates of CO<sub>2</sub> emissions from the forestry sector are based on forestry resource survey data that does not contain the parameters and variables required for the estimation of CO<sub>2</sub> removal by land use change and forestry. Rather, the intake of CO<sub>2</sub> by the forestry sector is indirectly calculated in past studies from data on deforestation and Aforestation areas; and this may have consequentially produced a great uncertainty in estimates. Soil is the largest carbon sink in the terrestrial ecosystem, playing a vital role for carbon absorption and prompting carbon transfer from the atmosphere to soils. Preliminary results show that the potential role of soils as a sink in China is possibly even larger than that of its forest sector, but previous inventory work in this area is lacking.

**5. Municipal Waste:** Very few studies have been performed in China to date on the inventory of methane emissions from municipal wastes. In the previous studies, the total emissions of China in 1990 for this sector was very roughly estimated as 0.6 to 2.45 Tg, using the IPCC recommended method and its default value of emission factors. Because of the lack of basic data, this estimate was made based on only one variable, urban population, while other important data, such as emission factors, waste production on a per capita basis, and so on, were set as constants. There is, however, regional heterogeneity and seasonal variability in climate, standard of living, and customs, and therefore in emission factors and waste production per capita. To develop an acceptable inventory for this subsection, then, data on methane emission factors and waste production per capita for different climatic zones, different standards of living, and various major living customs and waste management systems have to be investigated or measured.

#### Specific Problems Related to General Description of Steps and Submission of National Communication

There are significant policy-related gaps that need to be addressed in order for the general description of steps to be prepared and for the overall National Communication to be prepared and submitted. In particular, policy formulation work on the general steps will need to be undertaken and consensus will need to be achieved on both the policy content of the general steps and the other content (i.e. the inventory) of the National Communication. The specific areas for which programs and policies will need to be formulated in order to prepare the general description of steps are given in Decision 10 of COP 2 and include, "as appropriate": (1) programs related to sustainable development, research and systematic observation, education and public awareness, and training; (2) policy options for monitoring systems and response strategies; (3) policy frameworks for implementing adaptation measures and response strategies, with a view to integrating climate impact information into the national planning process; (4) building of capacity to integrate climate change concerns into medium and long-term planning; and (5) programs that contribute to addressing climate change and its adverse impacts. Aside from preparation of the general description of steps, the results of inventory work will need to be synthesized and approved by policy makers before the completed National Communication can be submitted.

#### Specific Problems Related to Public Awareness

Public and political awareness of climate change is very low in China. There are currently few awareness raising activities and certainly no long-term strategies for addressing the lack of awareness. Few materials for publicizing climate change are available; and no mechanism exists for bringing the issues to the attention of more than a very limited circle of policy makers.

## **B.2 Expected End of Project Situation**

The end of project situation will include the following components:

1. Capacity increased among relevant parties in the Chinese Government for developing climate change policy; and capacity increased among the China research community for producing results to inform that policy. In particular, China's capacity for preparing its national communications, as outlined in the UNFCCC, and the greenhouse gas inventories included therein will be strengthened.
2. A national inventory prepared, providing detailed information on the total emission (and/or uptake) of greenhouse gases in China in 1994 from each of the following sectors: energy, industrial processing, agriculture, forestry, and municipal waste.

3. Consensus reached on preparation and submission of greenhouse gas inventory results.
4. Consensus reached on a general description of steps taken or envisaged by China to implement the Convention, as well as on any other information China deems relevant to convey in its National Communication.
5. Information about climate change disseminated to the Chinese public and to the policy-making sector.
6. An Initial National Communication prepared in line with China's obligations and including a greenhouse gas inventory for 1994 and a general description of steps. The Initial National Communication will be submitted within two years and four months of signature of this project document.

### **B.3 Target Beneficiaries**

Primary target beneficiaries of the project will be the international community, as China's fulfillment of its Initial National Communication represents an important step in international efforts to abate climate change.

Secondary target beneficiaries of the project will include those agencies and individuals in government and the research arena who are able to build their capacity through the various project activities. The National Coordination Committee on Climate Change Policy and its secretariat based in the SDPC should both benefit from increased capacity and information in making decisions related to the submission of China's National Communication. In the research arena, those research institutes involved in inventory work should benefit from increased capacity in conducting climate change related research. Finally, many members of the general public are likely to benefit from increased knowledge about climate change generated by public awareness activities. The results of the project will also benefit the global climate change community, which will have access to improved data on China's inventory as well as increased information on China's plans for implementation of the UNFCCC.

### **B.4 Project Strategy and Implementation Arrangements**

#### **B.4.1 Strategy**

The overall strategy of the project will include adherence to the following guiding principles:

- Build on existing knowledge and expertise and avoid duplication, thus achieving both cost effectiveness and efficient use of the limited time available to complete the Initial National Communication.
- Emphasize integration of technology, policy, and public awareness.
- Use internationally established methodologies and make use of previous experiences from abroad in conducting climate change work.

Overall, the project will have three major parts that will build upon one another. These are the information section (the inventory), the policy section (the general description of steps, drafting of Initial National Communication, and incorporation into development plans and processes), and the public awareness section. The information section will feed into the other two sections through training (for the policy section) and through awareness materials developed (for the awareness section).

For preparation of the national inventory, work will be divided along sectoral lines into five parts (energy, industrial processes, agriculture, forestry, and municipal waste). A subcontractor will be selected through domestic competitive bidding to handle each part. Overseas training and domestic workshops will be utilized to build capacity for inventory work. International experts will be recruited for some sectors to assist in overseeing activities and to provide technical guidance to the relevant subcontractor in the use of internationally established methodologies.

Inventory work will build on IPCC data categories and methodologies, adapting them to the situation of China. Where there is a lack of data and estimates are considered too uncertain, field surveys and case studies will be utilized to provide a sounder basis for estimates. New data collected will be used in conjunction with revised emission factor estimates to extrapolate greenhouse gas emissions for various sub-categories of activity.

Preparation of a general description of steps and preparation and submission of the National Communication will be combined into one project module focused on policy work. This module will be distinct from the sector-by-sector inventory work discussed above. Policy work will be facilitated by domestic training and workshops, with inclusion of officials from key government agencies in key activities. A study tour abroad will focus specifically on a successful example of preparation of a National Communication. Results from the training, workshop, and study tour will be used along with results of climate change research to inform formulation of a general description of steps and preparation of a draft National Communication.

While an effort will be made in public awareness work to integrate results related to the National Communication, the public awareness activities themselves will be carried out in an independent module, separate from the inventory and "general description of steps" work discussed above. A subcontractor will be assigned to handle public awareness activities. A strategy of first implementing a public awareness program and, then, partly based on results, developing a longer term public awareness strategy will be adopted. Tools to be utilized in the awareness raising program include books and pamphlets, a website, and training workshops. Development of the long-term awareness raising strategy will build from case studies and from an expert workshop reviewing a draft plan based on analysis of the case studies.

#### B.4.2 Implementation Arrangements

The project will be executed by the State Development and Planning Commission (SDPC). The SDPC has the mandate, among Chinese Government agencies, for coordinating and leading national activities related to climate change. It heads China's National Coordinating Committee on Climate Change Policy. Throughout the project, SDPC will ensure frequent consultation and close collaboration with relevant national and provincial agencies and with appropriate regional and international organizations and institutions. Given its experience in managing UNDP projects, CICETE will be providing service to SDPC for project execution, including procurement and payment of all services, subcontracts and equipment in accordance with UN rules and procedures, as well as technical and financial reporting. (Details of arrangement will be stipulated in a Letter of Agreement between SDPC and CICETE.)

A project office responsible for administration of the project will be established by the SDPC. A **National Project Director** (NPD), as a part of government in-kind input, will be designated to lead this office. He/she will be responsible for effective management of the project and will oversee the functions of staffing, planning, and implementation of project activities and of official reporting to relevant agencies on project status. The SDPC will recruit a **Project Manager** to serve under the NPD. The manager, also a part of government in-kind input, will be responsible for the day-to-day management of the project, planning and managing project activities. The manager will obtain guidance from and report to the NPD. Full-time staff, including a full-time **National Project Coordinator**, will be recruited by the project for the office. The SDPC and other government agencies will make available, on a part-time basis and as a part of government in-kind input, various staff with expertise in areas related to climate change to assist with project activities.

To facilitate project management, all major components of the project will be implemented largely by domestic sub-contractors. Several international experts will be recruited to help ensure the effective transfer of international guidelines, methodologies and approaches, and to help ensure that the enabling activities are implemented to international standards.

### B.5 Reasons for Assistance from UNDP

Article 4.3 of the UNFCCC stipulates that, "The developed country parties and other developed parties included in Annex II shall provide new and additional financial resources to meet the agreed full costs incurred by developing country parties in complying with their obligations under Article 12, Paragraph 1." As the entity of financial mechanism for the Convention, the GEF has the responsibility of providing the financial resources necessary to enable China to fulfill its commitment of submitting an Initial National Communication.

UNDP, is one of the implementing agencies for the GEF and will be the implementing agency for this project. As a neutral, intergovernmental organization with a strong interest in the environment, UNDP is appropriate for this role. UNDP's overarching mandate is to help developing countries eradicate poverty. Fundamental to this task is promoting sustainable livelihoods --- ways of life that can sustain communities in to the foreseeable future. Thus, addressing climate change is an important issue for UNDP, as it is the developing world that will likely be hardest hit by the expected altered weather patterns, changes in food production, rising sea levels, and

links with public health. UNDP is committed to implementation of the UNFCCC as one of the key means of addressing climate change on an international level.

## **B.6 Special Considerations**

In order to promote women's participation, a priority of UNDP, an effort will be made to ensure that at least 30% of all trainees and participants in workshops will be women. The project will also give priority to female national experts to participate in the project activities. In order to increase the public awareness, some of the activities will specifically target on women, such as female farmers, consumers and decision-makers.

## **B.7 Coordination Arrangements**

Through the National Coordinating Committee on Climate Change Policy and the SDPC, the project will be closely coordinated with all other relevant climate change activities in the China. In particular, this includes coordination with the pipeline GEF project prepared using the same GEF PDF funds as the project described in this document. This project is aimed at building China's capacity to (1) estimate, measure, and monitor future GHG emissions; (2) better understand the potential impacts of climate change on Chinese society; and (3) analyze possible adaptation options.

UNDP is currently implementing some 11 projects related to climate change and/or energy management in China. In addition, UNDP is also working on sustainable agriculture and forestry management in China. In order to maximize the impact of international support and develop possible synergies between these projects and the proposed project, major findings and technical outputs generated by the former could be shared with experts and management staff working on the latter. For example, experts working on this project could be invited to join the workshops organized by other UNDP projects and vice versa.

## **B.8 Counterpart Support Capacity**

The SDPC is the government organization in China with the mandate of coordinating climate change work and has access to substantial technical expertise in the field. Through its responsibility for climate change, the SDPC has built up capacity relevant to the execution and implementation of this project. China's National Coordination Committee on Climate Change Policy is chaired by the SDPC; and its secretariat is based within the SDPC and staffed by SDPC personnel. In addition, the SDPC has successfully implemented the project formulation work, conducted with PDF funding, for this project and a sister project focused on targeted research.

## C Development Objective

The development objective of this project is to build up China's capacity in the climate change field and strengthen its ability to implement the UNFCCC. Progress towards this objective will ultimately contribute to the broader global objective of most effectively addressing the climate change issue through assessing the situation, curbing emissions, predicting impacts, and preparing for adaptation.

## D Immediate Objectives, Outputs and Activities

There are seven immediate objectives in this project. The first five of these may be considered as a group, separated according sector, with the common objective of the development of China's national inventory of GHG emissions and removals. The sixth immediate objective will be to develop a general description of steps taken and finally prepare the steps, along with inventory results, in a written document to submit to the UNFCCC as China's Initial National Communication. The seventh and last immediate objective will be to increase public awareness related to climate change in China.

### **Immediate Objective 1: Preparation of Energy Sector Inventory**

Preparation of 1994 energy sector inventory for incorporation into China's national inventory

- Success Criteria: 1994 China national inventory for GHG emissions from energy sector by device and energy type
- Responsibility: For all activities, Subcontractor 1 will take lead, with support from International Expert

**Output 1.1:** Estimates of GHG emissions from fossil fuel combustion

*Activity 1.1.1:* Collect and identify combustion activity data of fossil fuel by sector and type of device and provide energy sector activity data for 1994. Coal and oil product categories and transport activity data categories should match the ones recommended by the IPCC; and data on coal used as raw materials should be separated from that for coal used as fuel.

*Activity 1.1.2:* Train 4 researchers abroad in energy balance table developing and provide improved energy balance table for 1994.

*Activity 1.1.3:* Train 80 domestic employees on data collection and convene two workshops at the beginning and middle stage of the project on activity data collection, check and re-collection, respectively

*Activity 1.1.4:* As part of the input for determining emissions factors for carbon dioxide released during coal combustion, determine carbon content and calorific value (heat value) of the following categories of coals produced and consumed in China by type of coal (anthracite, bituminous, coking coal, and lignite): coal from state-owned, local, township and village coal mines, and coal consumed by key large users.

*Activity 1.1.5:* Determine fraction of oxidized carbon in different types of coal combustion, obtaining oxidized carbon values for different sizes of each of power plant boilers, industrial boilers, kilns, and residential stoves. Based on results of this and previous activity, determine emissions factors for carbon dioxide released during coal combustion.

*Activity 1.1.6:* Determine emissions factors for carbon dioxide from non-coal fuel combustion, including emissions factors for: (1) the transportation sector (by equipment and fuel type); (2) oil and natural gas combustion equipment; and (3) the energy transformation sector. Part of these data and information can be made available through the on-going UNDP projects of CPR/96/305 and CPR/96/309.

*Activity 1.1.7:* Estimate carbon dioxide emissions from fuel combustion and nitrous oxide emissions from the energy and transformation industry for 1994.

**Output 1.2:** Estimate of methane emissions from Chinese coal mining and post-mining activity

*Activity 1.2.1:* Determine methane emissions by type of coal mine: high- and low-methane underground state-owned coal mines, township and village coal mines, and surface coal mines.

*Activity 1.2.2:* Train 2 researchers abroad on main factors influencing coal-bed methane emission and their relationship

**Output 1.3:** Estimates for biomass activity level and emissions factors

*Activity 1.3.1:* Conduct a study of biomass consumption by type – wood, agricultural residue, livestock manure, etc. --- and emissions factors by biomass type and end-use device (e.g. different types of cookstoves).

*Activity 1.3.2:* Train two researchers abroad on investigation of biomass activity level and on identification of emission factors of biomass consumption by types.

**Output 1.4:** Estimates of methane leaks and fugitive emissions from oil and natural gas systems

*Activity 1.4.1:* Conduct a study of methane emissions from production of onshore oil, offshore oil, and natural gas and of methane emissions from transportation, distribution, storage, processing, and transformation of these fuels.

**Output 1.5:** Estimate of China's total methane emissions from energy activity in 1994

*Activity 1.5.1:* Compile data and information from activities 1.2.1 through 1.4.1 on methane emissions from fuel use in China and compute estimate of total methane emissions from energy activity

**Output 1.6:** Estimate of China's total GHG emissions from energy activity in 1994 and energy sector inventory

*Activity 1.6.1:* Prepare GHG emission inventory for energy activity in 1994, including estimate of total GHG emissions from energy activity

## **Immediate Objective 2: Preparation of Industrial Processes Inventory**

Preparation of 1994 industrial processes inventory for incorporation in to China's national inventory

- Success Criteria: 1994 inventory of carbon dioxide and nitrous oxide emissions from industrial processes in China
- Responsibility: For all activities, Subcontractor 2 will take lead, with support from International Expert

**Output 2.1:** Estimate of 1994 GHG emissions from cement production

*Activity 2.1.1:* Determine 1994 cement production by type in China through national and provincial data collection, providing production volume for five types of cement and for 60 different cement products.

*Activity 2.1.2:* Determine CO<sub>2</sub> emissions factor for cement production through 30 case studies and survey of 1000 facilities for limestone type and consumption. Provide case study data and information, collated survey results, and an improved understanding of limestone needed for clinker production.

*Activity 2.1.3:* Estimate total CO<sub>2</sub> emissions from cement production in China.

**Output 2.2:** Estimate of 1994 GHG emissions from lime production

*Activity 2.2.1:* Determine 1994 lime production by type in China through national and provincial data collection. Provide production volumes.

*Activity 2.2.2:* Conduct 20 case studies and surveys of 5,200 facilities to determine pure limestone consumption and calcium carbonate combustion loss. Provide limestone consumption data and calcium carbonate loss figures.

*Activity 2.2.3:* Determine calcium oxide content and measure calcium carbonate combustion rate through measurements at 30 primary kilns and provide calcium carbonate combustion rate estimates.

*Activity 2.2.4:* Estimate carbon dioxide emissions from lime production in China.

**Output 2.3:** Estimate of 1994 GHG emissions from iron and steel production process

*Activity 2.3.1:* Determine unit consumption of limestone through case studies in ten typical iron and steel plants of different scales, providing volume of limestone used per ton of output.

*Activity 2.3.2:* Determine and provide data on limestone consumption in 80 major enterprises.

*Activity 2.3.3:* Determine and provide data on limestone consumption in medium and small enterprises through a survey of 200 facilities.

*Activity 2.3.4:* Estimate carbon dioxide emissions from iron and steel production

**Output 2.4:** Estimate of 1994 GHG emissions from calcium carbide production

*Activity 2.4.1:* Determine calcium carbide production and purity data for 1994 and provide figure for equivalent volume of calcium carbide of standard purity produced.

*Activity 2.4.2:* Determine limestone consumption in 16 sample enterprises, providing limestone consumption per ton of calcium carbide output.

*Activity 2.4.3:* Determine limestone consumption in small plants through a survey of 100 facilities and provide limestone consumption data per ton of calcium carbide output for small facilities.

*Activity 2.4.4:* Estimate carbon dioxide emissions from calcium carbide production.

**Output 2.5:** Estimate of 1994 GHG emissions from adipic acid production

*Activity 2.5.1:* Determine and provide volume of adipic acid production for 1994.

*Activity 2.5.2:* Determine emissions factor (in the form of nitrous oxide emitted per ton of output) for adipic acid through measurements at three key enterprises.

*Activity 2.5.3:* Estimate total nitrous oxide emissions from adipic acid production.

**Output 2.6:** Estimate of China's total GHG emissions from industrial processes in 1994

*Activity 2.6.1:* Prepare overall emission inventory for industrial processes.

**Output 2.7:** Capacity built through workshops and international training for improving methodology to prepare inventory.

*Activity 2.7.1:* Held two workshops on the methodology for activity and emissions factors, respectively.

*Activity 2.7.2:* Train two persons abroad on methodology to prepare inventory for industrial processes

### **Immediate Objective 3: Preparation of Agricultural Sector Inventory**

Preparation of 1994 agricultural sector inventory for incorporation into China's national inventory

- Success Criteria: 1994 inventories for GHG emissions from agriculture, broken down by field type, cropping system, crop type, region, animal, and waste management system, as appropriate
- Responsibility: For all activities, Subcontractor 3 will take lead, with support from International Expert

**Output 3.1:** Estimate of 1994 methane emissions from wetland rice fields

*Activity 3.1.1:* Collect data on harvest area, application of nitrogen-based fertilizer, organic manure, watering regime, and rice cultivars from sample county surveys. Collect and extract meteorological and soil data, measured methane emission factors, and other relevant information for different types of rice fields from published data. Generate database of measured, collated and spatially extrapolated data.

*Activity 3.1.2:* Modify existing models, such as MERP, to estimate emission factors using various input parameters and variables and validate with measured data.

*Activity 3.1.3:* Calculate emission factors of sub-categories of rice fields under various conditions with the modified and validated models.

*Activity 3.1.4:* Determine harvest area of each sub-category of rice field with collated and spatially extrapolated data.

*Activity 3.1.5:* Determine methane emissions of each rice field sub-category with calculated emission factors and quantified harvest areas.

*Activity 3.1.6:* Quantify national methane emissions (for the year 1994) by region and rice field type through integrating the results from each sub-category.

*Activity 3.1.7:* Organize a 3 to 5 day workshop to train participants in data collection, collation, and analysis so that they will have the competence necessary to assist in the rice-field related project activities listed above. Efforts should be made to ensure women farmers' participation in these activities.

*Activity 3.1.8:* Train two Chinese technicians abroad, with continued follow-up technical assistance, in measurement and modeling techniques for wetland rice fields.

**Output 3.2:** Estimate of 1994 nitrous oxide emissions from croplands

*Activity 3.2.1:* Collect data on harvest area and application of nitrogen-based fertilizer and organic manure for major crops from sample county surveys.

*Activity 3.2.2:* For major crops of each major (relatively homogenous) region, determine crop harvest area and nitrogen-based fertilizer consumption by analyzing and extrapolating from survey data obtained from sample counties.

*Activity 3.2.3:* Collect nitrous oxide (N<sub>2</sub>O) emissions factors from published data for different types of croplands.

*Activity 3.2.4:* Develop a database (based on the foregoing activities of Output 3.2) containing measured, collated, and spatially extrapolated data.

*Activity 3.2.5:* Estimate nitrous oxide emissions from China's croplands by using collected and collated data.

*Activity 3.2.6:* Organize a 3 to 5 day workshop to train participants in data collection, collation, and analysis, so that participants will develop the knowledge and skills necessary to assist in the foregoing project activities related to nitrous oxide emissions from croplands.

*Activity 3.2.7:* Train two Chinese technicians abroad on the development of nitrous oxide inventories from croplands.

**Output 3.3:** Estimate of 1994 methane emissions from enteric fermentation

*Activity 3.3.1:* Collect population number and structure, feed components, and feed intake data for ruminant animals in sample county surveys.

*Activity 3.3.2:* Collect information on feed digestibility and methane conversion ration from published data.

*Activity 3.3.3:* Develop a database (based on the foregoing two activities) containing measured, collated, and spatially extrapolated data.



*Activity 3.3.4:* Modify C-MEEFL model to estimate emissions using various input factors and validate modified program.

*Activity 3.3.5:* Determine total methane emissions from ruminant animals by animal type.

*Activity 3.3.6:* Organize a three to five day workshop to train participants in data collection, collation, and analysis so that participants will have the capacity to assist in the above activities related to determination of emissions from enteric fermentation.

*Activity 3.3.7:* Train two Chinese technicians abroad, with continued follow-up technical assistance, in measurement and modeling techniques for methane production from enteric fermentation, as discussed above.

**Output 3.4:** Estimate of 1994 methane and nitrous oxide emissions from animal waste management systems

*Activity 3.4.1:* Collect data on the usage of animal manure management system, N excretion in addition to the data collected in Activity 3.3.1

*Activity 3.4.2:* Collect information on CH<sub>4</sub> and N<sub>2</sub>O emission factors from published literature for different animal manure and different manure management system.

*Activity 3.4.3:* Develop database of measured, collated and spatially extrapolated data.

*Activity 3.4.4:* Estimate total methane and nitrous oxide emissions for China from animal waste management systems using above-mentioned measured and collated data.

*Activity 3.4.5:* Organize a three to five day workshop to train participants in data collection, collation, and analysis with regard to emissions from animal waste management systems so that they will have the capacity to assist in the preceding two activities.

*Activity 3.4.6:* Train two Chinese technicians abroad, with continued technical assistance, in measuring and modeling techniques for nitrous oxide emissions from animal waste management systems, as discussed above.

**Output 3.5:** The emissions inventory for the agricultural section

*Activity 3.5.1:* Organize workshops to discuss detailed procedures and time schedules, review project performance mid-stream, discuss draft findings and prepare final reports, respectively. Prepare workshop proceedings for each of workshops.

#### **Immediate Objective 4: Preparation of Forestry Sector Inventory**

Preparation of 1994 forestry sector inventory for incorporation into China's national inventory

- Success Criteria: A GHG emissions/sinks inventory for forestry sector in 1994 broken down by region; detailed, validated, and aggregated databases; trained experts and technicians in the area of measuring emissions/sinks of forests
- Responsibility: For all activities, Subcontractor 4 will take lead, with support from International Expert

**Output 4.1:** 100 persons trained to assist in activities below related to forestry sector inventory

*Activity 4.1.1:* Organize a three to five day workshop to train participants in data collection, collation, and analysis.

**Output 4.2:** Chinese technicians trained in use of models and in soil data collection and measurement techniques

*Activity 4.2.1:* Arrange for training and technical assistance from abroad to build capacity of Chinese technicians in use of models and in soil data collection and measurement techniques.

Activity 4.2.2: Arrange for study tour from abroad to build capacity of Chinese researcher in use of models and in soil data collection and measurement techniques.

Activity 4.2.3: Attending international workshops on relevant fields.

Output 4.3: Land cover and land use change database

*Activity 4.3.1:* Collect land cover and land use change data from 1949 onwards by province and forest type. Validate data using maps and statistical data. Create database of collated, validated, and mapped data.

Output 4.4: Soil carbon database

*Activity 4.4.1:* For China's five regions, collect data on forest soil type and soil carbon content and estimate changes in soil carbon due to various disturbances. Based on this, develop database of collated, validated, and mapped data on soil carbon by region and forest type.

Output 4.5: Database of biophysical variables influencing GHG flows

*Activity 4.5.1* Collect biophysical data, by province and forest type, on wood density, carbon content, biomass growth, decomposition rates, harvest cycles, and other variables that influence GHG flows. Based on this, develop database of collated, validated, and mapped data (by region and forest type) on above variables.

Output 4.6: 1994 emissions inventory for the forestry sector

*Activity 4.6.1:* Using data from the three preceding activities and using the IPCC methodology, estimate carbon and other GHG flows from China's forests for 1994.

Output 4.7: Increased awareness among policy makers and practitioners in the forestry sector of ways to incorporate climate change considerations into Chinese forestry practices

*Activity 4.7.1:* Organize a national workshop to increase awareness among policy makers and forestry practitioners of ways to incorporate climate change considerations into Chinese forestry practices. Prepare summary of workshop proceedings.

## **Immediate Objective 5: Preparation of Municipal Waste Sector Inventory**

Preparation of 1994 municipal waste sector inventory for incorporation into China's national inventory

- Success Criteria: 1994 inventory of methane emissions from municipal solid waste and wastewater for China; databases and models to support inventory work in this sector
- Responsibility: For all activities, Subcontractor 5 will take lead, with support from International Expert

Output 5.1: Several individuals trained to assist in activities below related to emissions from municipal solid waste and wastewater

*Activity 5.1.1:* Organize and hold a three to five day workshop to train 10 participants in data collection, collation, and analysis for developing a municipal solid waste and wastewater emissions inventory. Organize and hold a national workshop to discuss and exchange the problems and results during the collection, collection and analysis of data.

Output 5.2: Capacity built through training in measurement and modeling techniques for developing a municipal solid waste and wastewater inventory

*Activity 5.2.1:* Train two Chinese technicians abroad, with continuing technical assistance afterwards, in measurement and modeling techniques for developing a municipal solid waste and wastewater methane inventory.

Output 5.3: Database of items relevant to emissions from municipal solid waste

*Activity 5.3.1:* By region and city, collect data on relevant items, such as municipal solid waste generation, decomposable organic fraction, methane released and recovered, and oxidation factors for the year 1994. Create database of collated and validated data for 1994.

**Output 5.4:** Estimation of lagged emissions from prior waste handling through the development of a model for this purpose

*Activity 5.4.1:* Model lagged emissions based on climate conditions and components of municipal solid waste and provides estimates of lagged emissions from prior waste handling.

**Output 5.5:** Estimates of methane emissions from wastewater handling systems

*Activity 5.5.1:* Estimate methane emissions from wastewater handling systems by city and region, based on volume of wastewater handled and on percentage of flared methane.

**Output 5.6:** A 1994 inventory of methane emissions from municipal solid waste and wastewater in China

*Activity 5.6.1:* Compile a 1994 inventory for methane emissions from municipal solid waste and wastewater handling systems in China, based on output from the preceding three activities.

## **Immediate Objective 6: Drafting of Initial National Communication and Incorporation into Development Strategies and Processes**

China enabled to fulfill its reporting obligations with respect to the UNFCCC, including preparation of a general description of steps and overall preparation of the National Communication

- Success Criteria: A general description of steps to be taken to implement the Convention; China's National Communication (submitted by end of December, 2002)
- Responsibility: The Inter-Ministerial Working Group

**Output 6.1:** A team qualified to draft initial national communication

*Activity 6.1.1:* Organize inception workshop

*Activity 6.1.2:* Train 15 provincial governmental officers for seven days to increase their understanding of the effects of global climate change on sustainable development in China. Training will include emphasis on the importance of taking the effects of climate change into account in national and local level development policies.

*Activity 6.1.3:* Organize a team including three provincial governmental officers and five researchers to go abroad to study the operation and management methods used for successful preparation of national communications

*Activity 6.1.4:* Organize consultative workshop to comment on the draft National Communication.

**Output 6.2:** Adaptation options and other climate change issues considered and incorporated into the nation's sustainable development strategies

*Activity 6.2.1:* Hold a workshop to introduce current results regarding the effects of climate change on various sectors in China and provide constructive suggestions for incorporation of adaptation to climate change into social and economic development strategies.

*Activity 6.2.2:* Set up an advisory group to review current results of climate change research, identify practicable adaptation technologies and strategies, analyze the gaps requiring further research, and formulate an operational method for integrating adaptation technologies/strategies into regional development policies.

**Output 6.3:** Initial National Communication drafted and approved

*Activity 6.3.1:* Based on results of the foregoing activities for this objective, prepare a general description of steps

Activity 6.3.2: Based on results of inventory work for each sector in the five preceding immediate objectives, prepare national inventory.

Activity 6.3.3: Incorporate general description of steps and national inventory into a final, fully prepared National Communication. Reach consensus on final draft and submit to relevant government body.

## **Immediate Objective 7: Increased Public and Political Awareness and Action Related to Climate Change**

- Success Criteria: Initial awareness raising program designed, awareness materials prepared and disseminated, 120 persons trained, website developed, and long-term strategy for awareness raising formulated
- Responsibility: Subcontractor 6 will take lead

**Output 7.1:** Awareness raising program

*Activity 7.1.1:* Identify and select subcontractor

*Activity 7.1.2:* Draft initial awareness raising program, taking into consideration of impact on women and their experience and contribution to National Communication.

*Activity 7.1.3:* Prepare summary tables comprehensible to persons unfamiliar with the climate change situation. These tables should include data on current emissions and the principal resources to be developed, and should compare these data with other reference data. The series of priority measures recommended to develop the resources and the proposed implementation modalities should also be included in the summary.

*Activity 7.1.4:* Circulate for comment and finalize the initial awareness raising program

**Output 7.2:** Documentation, media, website and workshop to promote awareness and understanding of climate change to a targeted audience through initial awareness raising program

*Activity 7.2.1:* Compile, publish, and distribute books and pamphlets related to climate change issues. Popularize climate change knowledge and publicize relevant activities in the climate change field.

*Activity 7.2.2:* Recruit climate change experts to prepare training materials.

*Activity 7.2.3:* Hold a training workshop with 60 participants in both Beijing and Shanghai, with participants including managers from medium and large commercial enterprises, teachers, staff of non-governmental organizations (private sector), consumer representatives, and policy makers. Use training materials prepared in previous activity.

*Activity 7.2.4:* Create a web site and network for exchange of climate change related information.

**Output 7.3:** Report on national long-term strategies for improving public awareness of climate change issues

*Activity 7.3.1:* Carry out case studies of good experiences in improving public awareness of climate change. Analyze the case studies in terms of activities, information content, achievements, and experiences of interest. Identify barriers in the case studies and countermeasures to overcome barriers. Analyze the potential for duplication of methods used in the case studies in long-term public awareness strategy.

*Activity 7.3.2:* Based on analysis of case studies, work out and draft a national long-term strategic framework for improving public awareness of climate change.

*Activity 7.3.3:* Hold expert workshop to discuss and revise long-term strategic framework for public awareness. Based on results of workshop, complete report entitled "Suggestions on Long-term National Strategies for Improving Public Awareness of Climate Change."

## E Inputs

### 1. UNDP/GEF Inputs by Project Component

UNDP/GEF contributions for the project, broken down by components and management costs, are given in the tables below. Detailed terms of reference for each of the seven subcontracts may be found in Annex 2. The terms of reference for all experts and a list of all equipment may be found in Annex 3 and Annex 5, respectively.

#### *Inputs for Objective 1 (Energy Sector Inventory)*

Item	Amount (in USD)
Subcontract	661,600
Equipment Supplies	31,300
International training (1 month x \$7,000 per month x 8 persons)	56,000
International Expert (2persons x 0.5months x \$18,000 per month)	18,000
Total	766,900

#### *Inputs for Objective 2 (Industrial Processes Sector Inventory)*

Item	Amount (in USD)
Subcontract	342,200
Equipment	20,000
International Training (2 persons x 3 months per person x \$7,000 per month)	42,000
International Expert (2 persons x 0.5 months x \$18,000 per month)	18,000
Total	422,200

#### *Inputs for Objective 3 (Agricultural Sector Inventory)*

Item	Amount (in USD)
Subcontract	545,100
Equipment supplies	120,000
International Training	40,000
International Expert (1 months x \$18,000 per month)	18,000
Total	723,100

#### *Inputs for Objective 4 (Forestry and Land Use Change Sector Inventory)*

Item	Amount (in USD)
Subcontract	202,300
Equipment	31,400
Intl. Training (3 persons x 3 months per person x \$7,000 per month)	63,000
Intl. Study Tour (1 person x 1 month per person x \$12,000 per month)	12,000
Intl. Workshops (6 persons / times per person x 3,000 per time)	18,000
International Expert (2 person x 0.5 months per person x \$18,000 per month)	18,000
Total	344,700

#### *Inputs for Objective 5 (Municipal Waste Sector Inventory)*

Item	Amount (in USD)
Subcontract	283,100
Equipment Supplies	25,000
International Training (2 persons x 3 months per person x \$7,000 per month)	42,000
International Expert (1 months x \$18,000 per month)	18,000
Total	368,100

*Inputs for Objective 6 (General Description of Steps)*

Item	Amount (in USD)
Personnel	124,000
Data Purchase	20,000
Equipment	26,000
Workshop and Training	82,500
Travel (general description steps)	24,000
Miscellaneous (workshop materials, etc.)	38,500
Total	315,000

*Inputs for Objective 7 (Public Outreach)*

Item	Amount (in USD)
Subcontract	100,000
Total	100,000

*Project Coordination Costs and Overall Technical Support*

Item	Amount (in USD)
Support Costs	105,000
Duty Travel	10,000
Audit	15,000
Intl. Monitoring and Evaluation	25,000
Natl. Monitoring and Evaluation	15,000
Inception and consultative workshops	30,000
Reports	104,000
National Project Coordinator (28 months x \$2,500 per month)	70,000
Staff (28 months x \$2,000 per month)	56,000
Miscellaneous: stationery, telecom, bank charges, etc.	30,000
Total	460,000

A table summarizing the totals of the budgets for each component and for coordination costs (i.e. a table summarizing the totals given in the eight mini-tables above) is given below:

*Summary of Total Inputs for Each Component and for Management Costs*

Item	Amount (in USD)
Inputs for Objective 1 (Energy Sector Inventory)	766,900
Inputs for Objective 2 (Industrial Processes Sector Inventory)	422,200
Inputs for Objective 3 (Agricultural Sector Inventory)	723,100
Inputs for Objective 4 (Land/Forest Sector Inventory)	344,700
Inputs for Objective 5 (Municipal Waste Sector Inventory)	368,100
Inputs for Objective 6 (General Description of Steps)	315,000
Inputs for Objective 7 (Public Outreach)	100,000
Coordination	460,000
Total	3,500,000

## **2. Government/Domestic Input**

Although full cost of the project shall be covered by GEF funding in accordance with the Convention, the Chinese Government will provide in-kind support to project implementation, in the form of officers, experts, facilities, information, transport, operations, and maintenance. This in-kind support is estimated in the table below:

**Table 9. Chinese Government Input (In-Kind)**

<b>Expenditure Category</b>	<b>Value (US\$ in-kind)</b>
Personnel (members of National Coordinating Committee, Project Steering Committee, National Project Director, Experts):	100,000
Operations and Facilities	50,000
Local Transport	20,000
Administrative and Financial Management Costs	70,000
<b>Total Costs</b>	<b>240,000</b>

## **F Risks**

The project faces certain risks, as delineated below. In each case, an explanation is given of why risk is considered manageable and of how project activities or strategies address the risk.

**1. The "general description of steps" produced will not substantiate the level of investment allocated for its preparation.** The risk that a somewhat disappointing "general description of steps" is produced is **moderate** for two reasons. First of all, the contents required for the "description", as delineated in Decision 10 of COP 2, are much more flexible, less concrete, and potentially subject to more political concerns than are those required for the national inventory. Second, China is, to some extent, lacking in research results to support formulation of certain policy-related steps, as might be included in the "description." A related targeted research project, originally developed as a part of the project described in this document, is currently under formulation. This project, also to be supported by GEF, would include substantial work on adaptation and vulnerability to climate change. If this work is completed in time, it will be used as input for work on the "description." Given the tight time limitations for preparing the National Communications and the fact that this second project has not yet been submitted to GEF for review, however, there is a possibility that the new results on adaptation and vulnerability will not be ready in time for use in the "description." Despite these issues, however, the design of the project has taken steps to ensure that the "description" will be substantive and represent the results of expanded capacity in the climate change policy realm. First of all, the "description" component will be subcontracted to a competent research organization, which will be able to spend more time formulating substantial policy options than would the government officials themselves. Second, project activities will allow for much needed forums among policy makers to discuss policy options; and the effectiveness of such forums will be enhanced by the provision of succinct and policy-oriented materials (on research to date and on possible policy options) by the subcontractor.

**2. The National Communication will not be completed in time.** The risk of this is **low**. China is committed to fulfilling its obligations under the UNFCCC; and the National Coordinating Committee on Climate Change Policy and its Secretariat in the SDPC have placed strong priority on the timely preparation of the Communication. In addition, the project has been carefully designed so that all elements required for the National Communication, as delineated in Decision 10 of the Second Conference of the Parties (COP 2) to the Convention, are addressed through project objectives, outputs, and activities. Finally, the risk that the National Communications will not be completed in time due to lack of integration of the various project components is minimized by plans to recruit both a National Project Coordinator and an International Team Leader.

**3. Individual sector inventories, despite substantial investment, will not represent a substantial improvement over past work.** The risk of this is **low**. Preparatory work for this project has focused on reviewing past work and identifying deficiencies. In areas where deficiencies have been identified, specific steps have been delineated for filling the gaps. In many cases, these include the gathering of primary data through surveys and measurements. The development of standard practices will be an important part of such fieldwork, to ensure uniformity across regions and to ensure that survey responses and measurements are properly entered, tabulated, and analyzed for statistical accuracy and precision. Work will also include

secondary data collection relying on national and provincial government sources. Accessibility of data from such sources should not be a problem, given that the Climate Change Steering Committee ultimately responsible for coordinating the project is both high-level and inter-ministerial in nature. Finally, because China has high-caliber and reputable research institutions available in each of the sectors and because training elements have been included in project design, there is little risk that the quality of the inventories will be lacking due to lack of either capacity or responsible implementation.

## **G Prior Obligations and Prerequisites**

There will be a few prerequisites to UNDP/GEF support to this project. First, the relevant government agencies must contribute or commit to contributing the necessary resources. These resources include commitment of the necessary staff to provide guidance and administrative management to the project. Second, a project office will need to be established and the Project Steering Committee expanded as described in Section B-4.

The project document will be signed by UNDP, and UNDP assistance to the project will be provided, subject to UNDP receiving satisfaction that the prerequisites listed above have been fulfilled or are likely to be fulfilled. When anticipated fulfillment of one or more prerequisites fails to materialize, UNDP may, at its discretion, either suspend or terminate its assistance.

## **H Project Reviews, Reporting, and Evaluation**

The project will be subject to tripartite review (TPR) by representatives of the Government, UNDP, and SDPC at least once every twelve months, the first such meeting to be held within the first 12 months of the start of implementation. The National Project Director (NPD) shall prepare and submit to each tripartite review meeting an Annual Programme/Project Review (APR)/Project Implementation Report (PIR). Additional reports may be requested, if necessary, during the project.

The project shall be subject to a final evaluation by independent evaluators. A final evaluation report and a project terminal report (to be prepared by the NPD and the project office) will be prepared and submitted to the final TPR. These shall be in draft form sufficiently far in advance so as to allow review and technical clearance by SDPC.

The project shall be submitted to an annual NEX audit according to the United Nations auditing standards. The auditing report will be made available to the funding agency.

## **I Legal Context**

This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of the People's Republic of China and the United Nations Development Programme, signed by the parties on 29 June 1979. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government cooperating agency described in that Agreement.

The following types of revisions may be made to this Project Document with the signature of the UNDP resident representative only, provided he or she is assured that the other signatories of the Project Document have no objections to the proposed changes:

Revision in, or addition of, any of the annexes of the Project Document;  
Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation; and  
Mandatory annual revisions that rephrase the delivery of agreed project inputs, or reflect increased expert or other costs due to inflation, or take into account agency expenditure flexibility.



## **J Budget**

### **J.1 Budget for Government Co-financing**

Budget line	Description	Total		Year 1		Year 2	
		w/m	US\$(1000)	w/m	US\$(1000)	w/m	US\$(1000)
10	Personnel	40	100	20	50	20	50
11	Operations and Facilities		50		25		25
12	Local Transport		20		10		10
13	Administrative and Financial management costs		70		35		35
	Total costs		240		120		120

### **J.2 Budget for UNDP/GEF Contribution (UNDP FIM Format)**

## **Annex 1: Work Plan**

Objective/Output	Activity	Description	Quarter											
			1	2	3	4	5	6	7	8	9	10		
Objective 1														
Output 1.1	Activity 1.1.1	Collect data on fossil fuel combustion activity												
	Activity 1.1.2	Domestic training and workshops on activity data collection and checking.												
	Activity 1.1.3	Training on energy balance table development												
	Activity 1.1.4	Determine carbon and heat content of coals												
	Activity 1.1.5	Determine fraction of carbon oxidized												
	Activity 1.1.6	Determine emission factors for non-coal fuel combustion												
	Activity 1.1.7	Estimate GHG emissions from fossil fuel combustion												
Output 1.2	Activity 1.2.1	Estimate methane emissions from coal mining activity												
	Activity 1.2.2	Training on coal-bed methane emission estimation												
Output 1.3	Activity 1.3.1	Conduct study of biomass consumption by type												
	Activity 1.3.2	Training on investigation of biomass activity level												
Output 1.4	Activity 1.4.1	Conduct study of methane leaks from oil and gas systems												
Output 1.5	Activity 1.5.1	Estimate total methane emissions from energy sector												
Output 1.6	Activity 1.6.1	Prepare energy sector GHG emissions inventory												
Objective 2														
Output 2.1	Activity 2.1.1	Determine cement production by type												
	Activity 2.1.2	Conduct case studies on emissions from cement sector												
	Activity 2.1.3	Estimate total CO <sub>2</sub> emissions from cement production												
Output 2.2	Activity 2.2.1	Determine lime production by type												
	Activity 2.2.2	Conduct case studies on limestone consumption and CaCO <sub>3</sub> loss												
	Activity 2.2.3	Measure calcium oxide content and combustion rate at kilns												
	Activity 2.2.4	Estimate total carbon dioxide emissions from lime production												
Output 2.3	Activity 2.3.1	Conduct case studies of iron and steel enterprises												
	Activity 2.3.2	Provide data from 80 major iron and steel enterprises												
	Activity 2.3.3	Conduct survey of 200 medium and small enterprises												
	Activity 2.3.4	Estimate CO <sub>2</sub> emissions from iron and steel production												
Output 2.4	Activity 2.4.1	Determine calcium carbide production and purity for 1994												
	Activity 2.4.2	Conduct survey of 16 sample calcium carbide producers												
	Activity 2.4.3	Conduct survey of 100 small producers of calcium carbide												
	Activity 2.4.4	Estimate CO <sub>2</sub> emissions from calcium carbide production												
Output 2.5	Activity 2.5.1	Determine volume of adipic acid production for 1994												
	Activity 2.5.2	Determine emissions factor for adipic acid												

	Activity 2.5.3	Estimate total NO <sub>2</sub> emissions from adipic acid production											
Output 2.6	Activity 2.6.1	Prepare overall emissions inventory for industrial processes											
Output 2.7	Activity 2.7.1	Held two workshops on the methodology for activity and emissions factors, respectively.											
	Activity 2.7.2	Train two persons abroad on methodology to prepare inventory for industrial processes											

*Workplan (continued from previous page)*

Objective/Output	Activity	Description	Quarter										
			1	2	3	4	5	6	7	8	9	10	
Objective 3													
Output 3.1	Activity 3.1.1	Conduct sample county surveys of rice paddies and prepare database	■	■	■	■	■	■	■				
	Activity 3.1.2	Modify models and validate the modifications	■	■	■	■	■	■	■				
	Activity 3.1.3	Calculate emissions factors for rice fields using modified models								■	■		
	Activity 3.1.4	Determine harvest area of each sub-category of rice field			■	■	■	■	■	■	■		
	Activity 3.1.5	Determine methane emissions from rice field sub-category								■	■		
	Activity 3.1.6	Quantify national methane emissions for wetland rice fields								■	■		
	Activity 3.1.7	Organize training workshop for work of wetland rice fields	■	■									
	Activity 3.1.8	Train two participants abroad for work of wetland rice fields	■	■	■	■	■	■	■				
Output 3.2	Activity 3.2.1	Collect data on harvest area and fertilizer use for major crops	■	■	■	■	■	■	■				
	Activity 3.2.2	Determine crop harvest area and fertilizer use for major crops		■	■	■	■	■	■	■			
	Activity 3.2.3	Collect N <sub>2</sub> O emissions factors for different types of croplands	■	■	■	■	■	■	■				
	Activity 3.2.4	Develop database for calculation of emissions from croplands	■	■	■	■	■	■	■	■			
	Activity 3.2.5	Estimate nitrous oxide emissions from China's croplands							■	■	■		
	Activity 3.2.6	Organize training workshop for fertilized cropland work	■	■									
	Activity 3.2.7	Train two participants abroad for fertilized cropland work	■	■	■	■	■	■	■				
Output 3.3	Activity 3.3.1	Conduct survey on ruminant animal characteristics	■	■	■	■	■	■	■				
	Activity 3.3.2	Collect information on feed digestibility and methane conversion ratio	■	■	■	■	■	■	■				
	Activity 3.3.3	Develop a database	■	■	■	■	■	■	■	■			
	Activity 3.3.4	Modify C-MEEFL model and verify modifications	■	■	■	■	■	■	■	■			
	Activity 3.3.5	Estimate total methane emissions from ruminant animals							■	■	■		
	Activity 3.3.6	Organize training workshop for ruminant animals work	■	■									
	Activity 3.3.7	Train two participants abroad for ruminant animals work	■	■	■	■	■	■	■				

Output 3.4	Activity 3.4.1	Collect data on the usage of manure management system, N excretion										
	Activity 3.4.2	Collect information on CH4 and N2O emission factors										
	Activity 3.4.3	Develop database										
	Activity 3.4.4	Estimate emissions from animal waste management systems										
	Activity 3.4.5	Organize training workshop for animal waste work										
	Activity 3.4.6	Train two participants abroad for animal waste work										
Output 3.5	Activity 3.5.1	Organize workshops for agricultural work as whole										
Objective 4												
Output 4.1	Activity 4.1.1	Organize training workshop for forestry sector work										
Output 4.2	Activity 4.2.1	Train technical staff abroad for forestry sector work										
	Activity 4.2.2	Study tour abroad for forestry sector work										
	Activity 4.2.3	Attending international workshops										
Output 4.3	Activity 4.1.1	Collect data and create land cover and land use change database										
Output 4.4	Activity 4.2.1	Collect data for and create soil carbon database										
Output 4.5	Activity 4.3.1	Collect biophysical data and create database										
Output 4.6	Activity 4.4.1	Estimate GHG flows to and from China's forest sector										
Output 4.7	Activity 4.7.1	Organize national workshop to increase awareness in sector										

**Workplan**  
(continued from previous page)

Objective/Output	Activity	Description	Quarter											
			1	2	3	4	5	6	7	8	9	10		
Objective 5														
Output 5.1	Activity 5.1.1	Organize training workshop for municipal waste work												
Output 5.2	Activity 5.2.1	Train technical staff abroad for municipal waste work												
Output 5.1	Activity 5.3.1	Collect data and create database of factors related to solid waste												
Output 5.2	Activity 5.4.1	Model and estimate lagged emissions from solid waste												
Output 5.3	Activity 5.5.1	Estimate methane emissions from wastewater handling systems												
Output 5.4	Activity 5.6.1	Prepare inventory for solid waste and wastewater sectors												
Objective 6														
Output 6.1	Activity 6.1.1	Train governmental officers on policy and effects of climate change												
	Activity 6.1.2	Organize study tour on preparation of national communications												
Output 6.2	Activity 6.2.1	Hold workshop on impacts and adaptation to climate change												
	Activity 6.2.2	Set up advisory group to review results and address policy issues												
Output 6.3	Activity 6.3.1	Inception workshop												
	Activity 6.3.2	Prepare general description of steps												
	Activity 6.3.3	Prepare national inventory												
	Activity 6.3.4	Consultative workshop												
	Activity 6.3.5	Prepare and submit National Communication												
Objective 7														
Output 7.1	Activity 7.1.1	Identify and select subcontractor for awareness activities												
	Activity 7.1.2	Draft initial awareness raising program												
	Activity 7.1.3	Prepare summary tables (for layman) on climate change situation												
	Activity 7.1.4	Circulate for comment and finalize a awareness raising program												
Output 7.2	Activity 7.2.1	Prepare and distribute books, pamphlets, etc. on climate change												
	Activity 7.2.2	Recruit climate change experts to prepare training materials												
	Activity 7.2.3	Hold training workshop on climate change												
	Activity 7.2.4	Create web site and network on climate change												
Output 7.3	Activity 7.3.1	Carry out case studies on improving public awareness												
	Activity 7.3.2	Draft long-term strategy for improving public awareness												
	Activity 7.3.3	Hold expert workshop to discuss and revise long-term strategy												

## **Annex 2: Outline Terms of Reference for Subcontracts (to be finalised at prodoc signature)**

Terms of Reference for subcontracts will be detailed and updated by the National Project Director with the assistance of the Project Manager, the National Project Coordinator, and the International Team Leader, during the initial phase of project implementation. Subcontracts will be awarded on the basis of domestic competitive bidding in order to identify and involve the most competent institutions.

### Outline TOR for Subcontract 1: Energy Sector Inventory

The key purpose of this subcontract will be the preparation of an inventory of greenhouse gas emissions for China's energy sector in 1994. The subcontractor will be responsible for all activities and outputs, apart from international training, listed under Immediate Objective 1 in the project document. The tasks associated with this work are listed below, followed by an estimated budget breakdown and listing of required qualifications:

#### *Tasks:*

1. Estimate carbon dioxide and nitrous oxide emissions from fossil fuel combustion in China in 1994, including the following new work in the analysis:

Prepare an improved energy balance table and energy sector data for 1994, including information on combustion activity by fossil fuel type and by device type.

Determine emissions factors for carbon dioxide emissions from coal combustion for different types of coals in different applications.

Determine emission factors for carbon dioxide emissions from oil and natural gas combustion.

2. Estimate methane emissions from energy sector activity in 1994, including the following new work in the analysis:

Determine methane emissions from Chinese coal mining and post-mining activity.

Estimate biomass activity level and emission factors.

Estimate methane leaks and fugitive emissions from oil and natural gas systems.

3. Based on output of the two tasks above, prepare greenhouse gas emissions inventory for energy activity in China in 1994 in appropriate format for incorporation into China's National Communication to the UNFCCC.

## **Outline TOR for Subcontract 2: Industrial Processes Sector Inventory**

The key purpose of this subcontract will be the preparation of an inventory of greenhouse gas emissions for China's industrial processes sector in 1994. The subcontractor will be responsible for all activities and outputs, apart from international training, listed under Immediate Objective 2 in the project document. The tasks associated with this work are listed below, followed by an estimated budget breakdown and listing of required qualifications:

### *Tasks:*

1. Develop estimate of greenhouse gas emissions from cement production in China in 1994, including the following new work in the analysis:

Determine 1994 cement production by type of cement and type of product.  
Determine carbon dioxide emissions factors through case study and survey work.

2. Develop estimate of greenhouse gas emissions from lime production in China in 1994, including the following new work in the analysis:

- Provide production volumes for 1994 lime production by type, based on national and provincial data.
- Provide data pure limestone consumption and carbonate combustion loss based on case studies and surveys.
- Provide calcium carbonate combustion rate estimates based on on-site measurements at kilns.

3. Develop an estimate of greenhouse gas emissions from iron and steel production processes, including the following new work in the analysis:

- Determine unit consumption of limestone through case studies.
- Provide data on limestone consumption in major enterprises.
- Provide data on limestone consumption in medium and small enterprises based on a survey of 200 facilities.

4. Develop estimate of greenhouse gas emissions from calcium carbide production in China in 1994, including the following new work in the analysis:

- Determine calcium carbide production and purity data for 1994.
- Provide limestone consumption per ton of calcium carbide output, based on results from sample enterprises.
- Determine limestone consumption of small plants based on survey work.

5. Develop estimate of greenhouse gas emissions from adipic acid production in China in 1994, including the following new work in the analysis:

- Determine adipic acid production in China in 1994.
- Determine emissions factor for adipic acid based on sample enterprises.

6. Develop estimate of China's total greenhouse gas emissions from industrial processes in 1994.

7. Capacity built through workshops and international training for improving methodology to prepare inventory.

- Held two workshops on the methodology for activity and emissions factors, respectively.
- Train two persons abroad on methodology to prepare inventory for industrial processes, especially adipic acid and iron & steel production.



### **Outline TOR for Subcontract 3: Agricultural Sector Inventory**

The key purpose of this subcontract will be the preparation of an inventory of greenhouse gas emissions for China's agricultural sector in 1994. The subcontractor will be responsible for all activities and outputs, apart from international training, listed under Immediate Objective 3 in the project document. The tasks associated with this work are listed below, followed by an estimated budget breakdown and listing of required qualifications:

#### *Tasks:*

#### **1. Provide estimate of 1994 methane emissions from Chinese wetland rice fields, including the following new work in the analysis:**

- Conduct field surveys to gather sample data on harvest area, application of nitrogen-based fertilizers and organic manure, rice cultivars, watering regime, and other relevant parameters.
- Collect meteorological, soil, and other relevant data from publications.
- Generate database of measured, collated, and spatially extrapolated data.
- Modify existing models to estimate emission factors using various inputs available and validate with field measured data and use modified model to calculate emission factors for various sub-categories of wetland rice fields.
- Determine harvest area and then methane emissions of each rice field subcategory. Using results, quantify national methane emissions for 1994 by region and rice field type.
- Organize three to five day workshop to train participants in data collection, collation, and analysis so that they will have competence to assist in aforementioned activities associated with this task.
- Provide assistance in the liaison work for arranging for the training of two young Chinese technicians abroad in measuring and modeling techniques for methane emission from wetland rice fields.

#### **2. Provide estimate of 1994 nitrous oxide emissions from croplands, including the following new work in the analysis:**

- Conduct field surveys to gather sample data on harvest area and application of nitrogen-based fertilizer and organic manure for major crops. Extrapolating from data, determine total crop harvest area and consumption of nitrogen-based fertilizer and organic manure by region and by crop.
- Collect nitrous oxide emissions factors for different types of croplands from published data.
- Estimate total nitrous oxide emissions from China's croplands using collected and collated data.
- Organize 3 to 5 day workshop to train participants in data collection, collation, and analysis so that they will have competence to assist in aforementioned activities associated with this task.
- Provide assistance in the liaison work for arranging for the training of two young Chinese technicians abroad in the development of inventories of nitrous oxides from croplands.

#### **3. Provide estimate of 1994 methane emissions from enteric fermentation, including the following new work in the analysis:**

- Conduct field surveys to collect sample data on population, animal structure, feed components, feed intake, and other relevant factors for ruminant animals.
- Collect information on feed digestibility and methane conversion ratio from published data.
- Develop database containing measured, collated, and spatially extrapolated data.
- Modify C-MEEFL model to estimate emissions;
- Estimate methane emission factors and total methane emissions by type of ruminant animal.
- Organize three to five day workshop to train 50 participants in data collection, collation, and analysis so that they will have competence to assist in aforementioned activities associated with this task.
- Provide assistance in the liaison work for arranging for the training of two Chinese participants of the project of the project abroad in measuring and modeling techniques for methane production from enteric fermentation.

#### **4. Provide estimate of 1994 methane and nitrous oxide emissions from animal waste management, including the following new work in the analysis:**

- Collect data on the usage of animal manure management systems, N excretion.

- Collect information on CH<sub>4</sub> and N<sub>2</sub>O emission factors from published literature for different animal manure and different manure management system.
  - Develop database of measured, collated and spatially extrapolated data.
  - Estimate total methane and nitrous oxide emissions for China from animal waste management systems in 1994, based on data collected and collated.
  - Organize 3 to 5 day workshop to train participants in data collection, collation, and analysis so that they will have competence to assist in aforementioned activities associated with this task.
  - Provide assistance in the liaison work for arranging for the training of two young projects abroad in measuring and modeling techniques for nitrous oxide emissions from animal waste management systems.
5. Prepare draft inventory of greenhouse gas emissions from the Chinese agricultural sector in 1994.
6. Hold three workshops, with the topics given below:
- Workshop 1: Discussion of project procedures (to be held at the initiation of project work)
  - Workshop 2: Review of project performance (to be held midway through project work)
  - Workshop 3: Discussion of draft findings (to be held toward the end of project work)

#### **Outline TOR for Subcontract 4: Forestry Sector Inventory**

The key purpose of this subcontract will be the preparation of an inventory of greenhouse gas sinks and emissions for China's forestry sector in 1994. The subcontractor will be responsible for all activities and outputs, apart from international training, listed under Immediate Objective 4 in the project document. The tasks associated with this work are listed below, followed by an estimated budget breakdown and listing of required qualifications:

##### *Tasks:*

1. Organize a three to five day workshop to train participants in relevant data collection, collation, and analysis work.
2. Provide assistance in the liaison work for arranging for the training of two Chinese technicians abroad in use of relevant models and in soil data collection and measurement techniques.
3. Prepare land cover and land use change database, soil carbon database, and database of biophysical variables influencing flows of greenhouse gases, incorporating the following new work into the databases:
  - Collect land cover and land use change data from 1949 onwards by province and forest type, validating data using maps and statistical data.
  - Collect data on forest soil type and soil carbon content for China's five major regions and estimate changes in soil carbon due to various disturbances.
  - Collect biophysical data, by province and forest type, on wood density, carbon content, biomass growth, decomposition rates, harvest cycles, and other variables that influence flows of greenhouse gases.
4. Based on databases prepared and on the IPCC methodology, prepare inventory of carbon dioxide and other greenhouse gas flows for China's forestry sector in 1994.
5. Organize a national workshop to increase the awareness among policy makers and forestry practitioners of ways to incorporate climate change considerations into Chinese forestry practices.

#### **Outline TOR for Subcontract 5: Municipal Waste Sector Inventory**

The key purpose of this subcontract will be the preparation of an inventory of greenhouse gas emissions from China's municipal solid waste and wastewater handling sector in 1994. The subcontractor will be responsible for all activities and outputs, apart from international training, listed under Immediate Objective 5 in the project document. The tasks associated with this work are listed below, followed by an estimated budget breakdown and listing of required qualifications:

##### *Tasks:*

1. Organize three to five day workshops to train 10 participants in data collection, collation, and analysis for developing a municipal solid waste and wastewater inventory. Organize and hold a national workshop to discuss and exchange the problems and results during the collection, collection and analysis of data.
2. Provide assistance in the liaison work for arranging for the training of two Chinese technicians abroad in measuring and modeling techniques for developing a methane inventory for municipal solid waste and wastewater.
3. Develop database of items relevant to emissions from municipal solid waste in 1994, incorporating the following new work into the database:

By region and city, collect data on relevant items, such as municipal solid waste generation, decomposable organic fraction, methane released and recovered, and oxidation factors.

4. Estimate lagged emissions from prior waste handling, incorporating the following new work into the analysis:

Model lagged emissions based on climate conditions and components of municipal solid waste.

5. Provide estimates of methane emissions from wastewater handling systems by city and region, based on volume of wastewater handled and percentage of flared methane.

6. Compile 1994 inventory on methane emissions from municipal solid waste and wastewater handling systems in China, based on output from the preceding three tasks.

**Outline TOR for Objective 6: General Description of Steps and National Communication**

The key purpose of this objective will be the preparation of a "general description of steps" and overall preparation of the National Communications, subject to government approval, to fulfill China's reporting obligations with respect to the UNFCCC. The subcontractor will be responsible for all activities and outputs, apart from international training, listed under Immediate Objective 6 in the project document. The tasks associated with this work are listed below, followed by an estimated budget breakdown and listing of required qualifications:

Tasks:

1. Provide training for 15 provincial governmental officers for seven days on climate change issues and their relevance in the development of national and local level development policies.
2. Organize a team of provincial governmental officers and researchers and provide assistance in the liaison work for arranging for them to travel abroad to study operation and management methods used in preparation of national communications.
3. Hold a workshop to introduce current results regarding the impacts of climate change on China and provide constructive suggestions for incorporation of adaptation to climate change into social and economic development plans.
4. Set up an advisory group to review current results from climate change research, identify practicable adaptation technologies and strategies, analyze gaps requiring further research, and formulate an operational method for integrating adaptation technologies/strategies into regional development policies.
5. Based on information gathered during study tour and on the output of the other tasks above, prepare a general description of steps and incorporate this and inventory results into a final, fully prepared National Communications.

**Outline TOR for Subcontract 6: Public Awareness**

The key purpose of this subcontract will be to strengthen and expand activities to increase public and political awareness and action related to climate change. The subcontractor will be responsible for all activities and outputs listed under Immediate Objective 7 in the project document. The tasks associated with this work are listed below, followed by an estimated budget breakdown and listing of required qualifications:

*Tasks:*

1. Compile, publish, and distribute books and pamphlets related to climate change issues.
2. Recruit climate change experts to prepare training materials and holding a training workshop with 60 participants in both Beijing and Shanghai. Participants should include managers from medium and large industrial enterprises, teachers, staff of non-governmental organizations, and policy makers.
3. Create a web site and network for climate change related information exchange.
4. Carry out case studies of good examples of improving public awareness of climate change. Based on analysis case studies, formulate and draft a national long-term strategic framework for improving public awareness of climate change, and hold an expert workshop to discuss and revise the strategic framework.

### **Annex 3: Terms of Reference for National Professionals and International Consultants** **(To be finalised at prodoc signature)**

#### **Terms of Reference for National Project Director**

The Government shall appoint a National Project Director (NPD) to be responsible, on behalf of the government, for the project. It is likely that the NPD will be a senior official from the executing agency. The NPD will be supported by the Project Manager and will work closely with the Project Management Office, National Project Coordinator, and International experts. The NPD will be responsible for:

Assuring the Government inputs to the project are forthcoming in a timely and effective manner  
Assuring the project stays in line with national programmes, strategies, and objectives  
Overseeing project implementation and the timely undertaking of all activities, in particular, the timely preparation and submission of China's Initial National Communications

In close coordination with the International Team Leader and with the support of the Project Manager and National Project Coordinator, the NPD shall:

1. Oversee establishment of the Project Management Office with systems put in place for sound management of all project subcontracts and financial disbursements.
2. Approve-detailed draft workplan and inception report for all seven project objectives and contribute to identifying resource requirements, responsibilities, task outlines, performance evaluation criteria and workplans/schedules.
3. Contribute to the development of detailed and measurable quarterly performance indicators.
4. Approve quarterly workplans, which are to include indication of extent to which previous quarter's activities have contributed to project's overall objectives.
5. Submit, as required, Annual Performance Review (APR) to tripartite (TPR) review meetings.
6. Approve detailed terms of reference and qualifications for each subcontract.
7. Support the establishment of project administration procedures for all staff, subcontractors and participating agencies.
8. Approve quarterly status and financial reports for comment and approval of the Project Steering Committee.
9. Approve six month budget forecast requests for approval of the Project Steering Committee.
10. Oversee implementation of Project Steering Committee directives.

#### **Terms of Reference for International Expert on Energy Sector Emissions**

*Duration:* 2 experts x 0.5 months

*Qualifications:*

Postgraduate degree in energy related field  
Extensive experience in estimating greenhouse emissions from the energy sector  
Sound project management experience  
Project team experience

*Language:* English

*Duties:*

Assist National Project Director in preparing the portions of the workplan and inception report dealing with the energy sector. Provide suggestions and feedback to the subcontractor for Objective 1 (energy sector inventory) on methodology to be used for analyzing carbon dioxide, nitrous oxide, and methane emissions from the energy sector, including emissions from coal, oil, and natural gas combustion, as well as emissions from coal mining activity, biomass activity and leaks and fugitive emissions from oil and natural gas systems. Monitor results of activities for Objective 1, providing technical feedback. Review draft of energy sector inventory and provide feedback.

**Terms of Reference for International Expert on Emissions from Industrial Processes**

*Duration:* 2 experts x 0.5 months

*Qualifications:*

Postgraduate degree in relevant science or engineering field  
Extensive experience in estimating greenhouse emissions from the industrial processes sector  
Sound project management experience  
Project team experience

*Language:* English

*Duties:*

Assist National Project Director in preparing the portions of the workplan and inception report dealing with the industrial processes sector. Provide suggestions and feedback to the subcontractor for Objective 2 (industrial processes sector inventory) on methodology to be used for analyzing greenhouse gas emissions from cement, lime, iron and steel, calcium carbide, and adipic acid production. Monitor results of activities for Objective 2, providing technical feedback. Review draft of industrial processes sector inventory and provide feedback.

**Terms of Reference for International Expert on Emissions from Agricultural Sector**

*Duration:* 2 experts x 0.5 months

*Qualifications:*

Ph.D. degree in *animal waste management or air pollution control*  
Extensive experiences in measuring CH<sub>4</sub> and N<sub>2</sub>O emissions from animal manure management systems  
Extensive experience in estimating CH<sub>4</sub> and N<sub>2</sub>O emissions from animal manure management systems

*Language:* English

*Duties:*

Assist Sub-project 3 of animal manure management systems to set up and start up measurement of methane and N<sub>2</sub>O emissions from animal manure management systems.  
Provide suggestions and feedback to the subcontractor for sub-project 3 (animal manure management systems) on methodology  
Reviews draft inventory and provide feedback.

Recommended expert:

Dr. Lawyer from ARS, USDA  
The Contact Address:

Lawyer, Professor  
Agriculture research Service  
USDA

### **Terms of Reference for International Expert on Sinks and Emissions of Forestry Sector**

*Duration:* 0.5months x 2 persons

*Qualifications:*

Postgraduate degree in relevant science or engineering field  
Extensive experience in estimating greenhouse sinks and emissions from the forestry sector  
Sound project management experience  
Project team experience

*Language:* English

*Duties:*

Assist National Project Director in preparing the portions of the workplan and inception report dealing with the forestry and land use sector. Provide suggestions and feedback to the subcontractor for Objective 4 (forestry sector inventory) on methodology to be used in developing land cover/land use change, soil carbon, and biophysical variables databases and in estimating greenhouse emissions and sinks of the forestry sector based on these databases. Monitor results of activities for Objective 4, providing technical feedback. Review draft of forestry sector inventory and provide feedback.

### **Terms of Reference for International Expert on Emissions from Municipal Solid Waste and Wastewater**

*Duration:* 1 month, two times, for 0.5 months for each time

*Qualifications:*

Postgraduate degree in relevant science or engineering field  
Extensive experience in estimating greenhouse sinks and emissions from the municipal solid waste and wastewater sectors, extensive experience in developing and application of model in municipal solid waste sector and wastewater.  
Sound project management experience  
Project team experience

*Language:* English

*Duties:*

Assist National Project Director in preparing the portions of the work plan and inception report dealing with the municipal waste sector and wastewater handling system. Provide suggestions and feedback to the subcontractor for Objective 5 (municipal waste sector inventory) on methodology to be used in developing database related to municipal solid waste emissions, estimating lagged emissions from municipal solid waste, and estimating emissions from wastewater handling systems. Monitor results of activities for Objective 5, providing technical feedback. Review draft of municipal waste sector inventory and provide feedback.

#### **Annex 4: Terms of Reference for Overseas Training (to be finalised at prodoc signature)**

Background:

The project will support some overseas training. Training will be specifically tailored to the needs of the project and to increase capacity in China for the preparation of future national communications.

There will be two types of training for this project:

1. *An overseas study tour* will be designed to benefit policy makers, as well as the researchers that support them, by providing exposure to management of and procedures for preparing national communications. The study tour will be 3 weeks in duration.

2. *International training fellowships* will include short-term placements in relevant agencies and short certified courses at universities or other institutions of higher learning. International training fellowships will be targeted at mid-level technical staff specifically involved in relevant greenhouse gas emissions inventory work. Training fellowships will be of three months in duration and should take place near the start of the project to ensure that capacity built can be utilized in the preparation of China's initial national communication.

Procedure:

For each training program called for in the project activities, the National Project Director (NPD), will be responsible for making final decisions on which individuals will participate and which foreign institutions will be involved. Recommendations with justifications will be provided in written form for each training activity by the relevant subcontractor and relevant international expert. After the NPD has made the final decision the relevant subcontractor will be responsible for assisting with liaison work to assure that the overseas training is smoothly implemented.

Trainees chosen must meet the qualifications stipulated by the overseas host training institute or agency. These may range from certain standards of English language proficiency, educational qualifications, and work experience. An effort will be made to ensure that no less than 30% of the trainees are women and that equal opportunities are given to suitable men and women candidates.

After completion of training, each individual completing a training fellowship and one representative of the study tour will be responsible for submitting a return to post report within two weeks of commencement of work duties following the training. These reports should clearly specify how the trainee/study tour group intends to use the training received for improved implementation of the project.

Specific Training Activities:

The following are the training activities called for by project activities, with some preliminary suggestions of host institutions:

<b>Training Activity</b>	<b>Project Component</b>	<b>Duration</b>	<b>Suggested Host Institutions</b>
1. Training of four technical staff abroad in energy balance table developing	Energy sector	1 month	TDB
2. Training of two staff in coal-bed methane emission	Energy sector	1 month	TDB
3. Training of two staff on biomass activity level	Energy sector	1 month	TDB
4. Training of two technical staff abroad in methodology to prepare industrial processes	Industrial Processes	3 months	TDB



inventory	sector		
5 Training of two technical staff abroad, with continued follow-up technical assistance in measurement and modeling techniques for methane emissions from rice paddies.	Agricultural Sector Inventory	3 months	TDB
6. Training of two technical staff abroad, with continued follow-up technical assistance, in the development of nitrous oxide inventories from croplands	Agricultural Sector Inventory	3 months	TDB
7. Training of two technical staff abroad, with continued follow-up technical assistance, in measurement and modeling techniques for methane production from enteric fermentation.	Agricultural Sector Inventory	3 months	TDB
8. Training of two technical staff abroad, with continued technical assistance, in measuring and modeling techniques for nitrous oxide emissions from animal waste management systems.	Agricultural Sector Inventory	3 months	TDB
9. Training of two technical staff abroad in the use of models and in soil data collection and measurement for the preparation of forestry sector inventory	Forestry Sector Inventory	3x3 months	TDB
10. Study tour of one person abroad to learn the use of models and in soil data collection and measurement for the preparation of forestry sector inventory	Forestry Sector Inventory	1x1 month	TDB
11. Attending international workshops (6person/times per person x 3,000 per time)	Forestry Sector Inventory	6 x 1 week	TDB
12. Training of two technical staff abroad, with continuing follow-up technical assistance, in measurement and modeling techniques for developing a municipal solid waste and wastewater methane inventory.	Municipal Waste Inventory	1 months	TDB
13. Study tour abroad for team of three provincial governmental officers and five researchers to learn about the operation and management methods used for successful preparation of national communications	General Description of Steps and National Communication	3 weeks	TDB

**Annex 5: Equipment List (to be finalised at prodoc signature)**

**Objective 1: Energy Sector Inventory**

**Objective 2: Industrial Processes Inventory**

**Objective 3: Agricultural Sector Inventory**

**Objective 4: Forest Sector Inventory**

**Objective 5: Municipal Waste Sector Inventory**

**Objective 6: General Description of Steps**

## **Annex 6: Overview of China's GHG Emissions and Vulnerability to Climate Change**

### China's Vulnerability to Climate Change

China is already burdened with a range of problems related to climate and natural disaster. Within its large arid and semiarid areas, for example, desertification and recurring drought are serious issues. Global climate change could serve to exacerbate those problems that already exist and may present new ones as well.

Throughout history, China has experienced many droughts and floods, the frequency of which might increase with climate change. According to historical records, more than 1,000 severe droughts occurred between 206 BC and 1949. Since 1949, severe droughts occurred in 1959, 1960, 1961, 1972, 1978, and 1997. The last three of these were extremely serious and extensive. The historical records also show that, throughout history, there have been a similar number of major floods, occurring predominantly over the middle and lower reaches of the Yangtze River, Yellow River, Huaihe River, and Haihe River, which together cover the major agricultural zones of China. Since 1949, most major rivers have been partially controlled and many water conservation projects have been undertaken, helping to reduce flood damage. Despite this work, floods still result in serious damage. Based on statistics, up to 7.34 million hectares of farmland were inundated by floods between the 1950s and 1970s. Of this land, over 4 million hectares was seriously damaged. Despite all the stepped-up control efforts made in recent years, extremely severe floods occurred along the Yangtze River in South China in 1991, 1996, 1997, and 1998. These recent experiences point to the potential difficulty that China would have in adapting to an increase in the frequency of major floods and droughts, as might occur with global warming.

Coastal inundation and an increase in natural disasters in coastal areas potentially brought about by climate change are also serious considerations for China. The Chinese mainland coastline is about 18,000 km long, with the coastal zone accounting for 13% of the nation's total land area, 42% of its population, and 60% of GDP. Consequently, the eight littoral plains and many estuarine deltas that make up the Chinese coastal zone would be very vulnerable to impacts from climate change. Around 11% of the area of China's coastal zone lies below 5 meters elevation and is thus particularly prone to the influence of sea level rise and storm surges, while saline intrusion into estuarine waters and groundwater threatens coastal ecosystems and freshwater supplies. Currently, tropical cyclones, or typhoons, may reach as far as 40°N in China, although most make landfall along the coastline south of Zhejiang Province. On annual average, about 28 typhoons affect the offshore areas of China and about eight affect inland areas, with the number varying greatly from year to year. Storm surges over one meter high occur, on average, six times annually at various locations on the Chinese coast, with those over two meters high occurring at least once annually. Rising sea level and an increase of typhoon frequency or intensity, both potential consequences of climate change, would increase the frequency of such storm surges.

The potential impact of climate change on the behavior of the El Niño-Southern Oscillation (ENSO) is also of vital importance to China. The frequency of occurrence of droughts, floods, and typhoons in some regions of China has been found to correlate with the occurrence of ENSO. While the relationship is complex, it suggests that there would be further links, in addition to those mentioned above, between climate change and natural disasters.

Another area of special concern to China is that of the impacts of climate change on agriculture, forestry, and natural ecosystems. Preliminary studies have shown that natural ecosystems in China could face significant impacts from climate change, including changes in the composition, structure, and carbon storage potential of vegetation. Agriculture is of vital importance to China, as rural residents make up 70% of the total population. A substantial decrease in precipitation has already occurred over eastern China's farming regions. Some research on Northeast China, one of the major industrial and agricultural regions of Asia, has indicated that annual precipitation in that area has been decreasing in the region since 1965, while average temperatures have risen by up to 1°C over the last 100 years. (It has also been found, however, that temperatures have actually dropped slightly in parts of Southern China.) Any potential future water shortage due to climate change would threaten the sustainability of north China's agricultural development and enhance the difficulties of increasing irrigated land area. Forestry is also a key land use sector in China, not only supplying wood and other forest products, but also playing a key role in environmental protection. Major Afforestation projects are underway to help control erosion and provide shelter. The options for extending forested land, however, are limited, principally due to inadequate rainfall in large parts of the nation. With temperature rise and other climatic changes, this situation could worsen; and consequent changes in forest fire frequency and intensity would also be of great

concern. In sum, it has already become increasingly clear that Chinese agriculture, forestry, and natural ecosystems are sensitive to local climatic changes, with the implication that the consequences of global change could be extensive in these sectors.

### China's Greenhouse Gas Emissions

Given the current scale of the Chinese economy and its potential for growth, the situation of China in terms of greenhouse gas emissions is of vital interest to the international community. China is currently the world's second largest emitter of carbon dioxide (the most significant of all greenhouse gases). It has been projected that by 2025 China will not only be the top emitter of carbon dioxide (CO<sub>2</sub>), but will also have total CO<sub>2</sub> emissions greater than those of the U.S., Canada, and Japan combined.<sup>1</sup> The key sectors for greenhouse gas emissions and sinks in China are energy, industry (industrial processes), agriculture, forestry, and municipal solid waste. Despite the global significance of China's greenhouse gas emissions, the current status of its emissions is not well understood, indicating a need for further work on a sector by sector basis.

China's potential for economic growth, and thus for the growth in greenhouse gas emissions that generally accompanies economic growth, can be seen by reviewing some recent statistics on the Chinese economy. In 1998, China's GDP was 7.955 trillion Renminbi (RMB), with an annual growth rate over the previous year's GDP of 7.8% and a per capita GDP of US \$770 (based on calculations using the end-of-year foreign exchange rate). From 1993 to 1997, the annual economic growth rate in China averaged 11%, surpassing the world average and the average of developed countries by 7.3 and 8.8 percentage points, respectively, for the same period.

Of the key sectors for greenhouse gas emissions in China, the energy sector is the most significant in terms of total emissions. China currently ranks second worldwide in energy consumption. Coal is the major source of fuel in China and thus plays an extremely important role in the nation's social and economic development. This is particularly significant in terms of greenhouse gas emissions, because combustion of coal produces more CO<sub>2</sub> per unit energy than do other fossil fuels. Coal accounts for 75% of total primary energy consumption in China; and China's coal consumption accounts for about 30% of coal consumed worldwide. China has adopted extensive programs to slow growth in energy consumption and has made substantial progress over the last twenty years in controlling that growth, which has consequentially risen at only about half the rate of economic growth. Due to the continued use of out-dated technologies, however, utilization efficiency remains lower than that in the developed countries. Also, because China stands on the threshold of an era of continued economic growth, increases in energy consumption are inevitable, with coal, given the endowment of natural resources in China, being the cheapest and most available source of energy to fuel that growth. Thus, China's coal-dominated energy structure is not likely to change in the short term; and greenhouse gas emissions resulting from energy consumption will continue to increase.

Oil and gas make up the second most important segment of China's energy sector. Together they account for about 20% of China's energy consumption. In 1997, oil and natural gas production reached 160.76 million tons and 160 billions cubic meters, respectively, with imports also playing an increasingly important role. Within two to three decades, the production and consumption of oil and gas is expected to increase significantly, in large part as a result of the rapid growth of the transportation sector. Thus, greenhouse gas emissions from this subsector may also become more important in the future.

Industrial processes are important in terms of greenhouse gas emissions, but further and in-depth research on emissions from such processes is required in China as well as around the world. China is a large producer of cement, lime, iron and steel, calcium carbide, and adipic acid, all of which have production processes that are undoubtedly important sources of greenhouse gas emissions. Given the large number of such manufacturing enterprises in China and the great disparity in technologies and processes, huge uncertainty exists in both the data on production levels and the emissions factors.

The agricultural sector is also a significant source of greenhouse gas emissions in China, with the most significant emissions from the sector being methane released during rice cultivation, methane and nitrous oxide released from the animal husbandry subsector, and nitrous oxide released from fertilized cropland. Rice production in China accounts for about 39% of world rice output. The contribution of rice paddy fields in China to global methane emissions has been a great concern to the international community. It is thus important to

---

<sup>1</sup> "Strategic Options for Reducing CO<sub>2</sub> in China," Fang Dong et al in *Energizing China*, Michael McElroy, et al, ed., Harvard University Press, 1998.

accurately quantify emissions factors and harvest areas for each category of rice field. The regional heterogeneity in geographic and climatic conditions of wetland rice fields and the large complexity in watering regime, fertilizer application, and other farm operations in rice cultivation, however, make it difficult to accurately quantify emissions factors and activity levels and thus present a challenge in developing a sufficiently accurate methane emissions inventory for the subsector.

China has the largest domestic livestock population in the world, with cattle and swine accounting for about 8% and 40% of the global population, respectively. Enteric fermentation and livestock waste together make up the second largest source for agricultural methane emissions in China. In the past decade, the nation's populations of cattle and swine have been increasing at rates of 0.4 and 15 million heads per year, respectively. China's livestock is widely distributed over several climatic zones, with large variability in feed characteristics, feed intake, and waste management. These parameters are important to methane emissions inventory development, but their values still remain greatly uncertain, so that strong efforts will be needed before a sufficiently accurate inventory of methane emissions from enteric fermentation and of methane and nitrous oxide emissions from livestock wastes can be made.

Cropland that is subject to amendment with nitrogen-based chemical fertilizers is one of the major sources of nitrous oxide emissions in China. During 1980-1995, the annual amount of nitrogen-based fertilizer consumption in China increased from 9.7 million tons to 25.2 million tons. With great complexity in terms of crop cultivation, management systems, and agricultural conditions and with a lack of experimental data, the study of nitrous oxide emissions from fertilized land in China is in its infancy; and much work remains to be done in order to reduce the hundred-fold uncertainty in current estimates.

Forests are important sinks for greenhouse gas emissions, as trees and other green plants take up carbon dioxide from the atmosphere for growth. China has undertaken extensive Aforestation activities for the past several decades, with almost 30 million hectares of land having been afforested. Currently, China's forests are estimated to be net sinks of the order of 50-90 million tons of carbon annually.

Methane emissions from municipal solid wastes is thought to be an important contributor to greenhouse gas emissions in China. Over the past 20 years, the living standard in China has been rising and unprecedented developments in urbanization and growth of the urban population have been occurring. As a result, solid wastes are produced daily in large amounts, but waste management and treatment systems are still very poor. Such a situation usually leads to serious impacts on urban environmental sanitation and the health of city dwellers, as well as intensive emissions of methane via fermentation of organic wastes. Because of the poor level of management of urban wastes, little data relevant to estimating an urban wastes methane emissions inventory is yet available, thus making the task of developing an inventory for past years a difficult task.

## **Annex 7: Decision 10 of the Second Conference of the Parties (COP 2) to the UNFCCC**

From: FCCC/COP/1996/15/Add.1

English

Page 42

### **Decision 10/COP 2**

#### **Communications from Parties not included in Annex I to the Convention: guidelines, facilitation and process for consideration**

*The Conference of the Parties,*

*Recalling* Article 12.1, 12.5 and 12.7 of the United Nations Framework Convention on Climate Change,

*Recalling also its* Decision 8/COP 1 on first communications from Parties not included in Annex I to the Convention and Decision 4/COP 1 on methodological issues,

*Noting* that, in accordance with Article 12.5 of the Convention, each Party not included in Annex I to the Convention shall make its initial communication within three years of the entry into force of the Convention for that Party, or of the availability of financial resources in accordance with Article 4.3, and that Parties that are least developed may make their initial communication at their discretion,

*Recognizing* that, in accordance with Article 4.7, the extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology, and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties,

*Having considered* that from its first session, in accordance with Article 12.7, the Conference of the Parties shall arrange for the provision to developing country Parties of technical and financial support, on request, in compiling and communicating information under this Article, as well as in identifying the technical and financial needs associated with proposed projects and response measures under Article 4. Such support may be provided by other Parties, by competent international organizations and by the secretariat, as appropriate,

1. *Requests* the Convention secretariat:

(a) In accordance with Article 8.2(c), to facilitate assistance to Parties, particularly developing country Parties, in the preparation of their initial communications, through the organization of workshops at the regional level; to provide a forum for the exchange of experiences in the development of emission factors and activity data for the estimation of the inventory, as well as, on request, for other elements of information in the initial communication; and to provide a report to the Subsidiary Body for Implementation and the Subsidiary Body for Scientific and Technological Advice at each of their sessions; and

(b) To make available to the Subsidiary Body for Implementation, at each of its sessions, details of the financial support made available to Parties not included in Annex I to the Convention (non-Annex I Parties) from the interim operating entity of the financial mechanism for the preparation of their initial communications, including projects in this regard proposed by each Party, the funding decision and the date and amount of funds made available to the Party;

2. *Decides*:

(a) That non-Annex I Parties should use the guidelines contained in the annex to the present decision when preparing their initial communications under the Convention;

(b) That the national and regional development priorities, objectives and circumstances of non-Annex I Parties should, in accordance with Article 4.1, and the provisions of Article 3 and Article 4.3, 4.4, 4.5, 4.7, 4.8, 4.9 and 4.10, be taken into account by the Conference of the Parties in considering matters related to their initial communications; and

(c) That non-Annex I Parties which wish to submit voluntarily additional information may use elements from the guidelines approved for Parties included in Annex I to the Convention when preparing their initial communications.

*8th plenary meeting  
19 July 1996*

From: FCCC/COP/1996/15/Add.1  
English  
Page 44

## **Annex 8: Guidelines for the Preparation of Initial Communication by Parties not Included in Annex I to the Convention**

1. The guidelines for the preparation of initial communications by Parties not included in Annex I to the Convention (non-Annex I Parties) have five principal objectives, taking into account Article 4.7:

- (a) To assist non-Annex I Parties in meeting their commitments under Article 12.1;
- (b) To encourage the presentation of information in ways that are, to the extent possible, consistent, transparent and comparable as well as flexible, and to take into account specific national situations and requirements for support to improve the completeness and reliability of activity data, emission factors and estimations;
- (c) To serve as policy guidance to the interim operating entity of the financial mechanism for the timely provision of financial support needed by the developing country Parties to meet the agreed full costs in complying with their obligations under Article 12.1, as referred to in decision 11/CP.2;
- (d) To facilitate the process of preparation, compilation and consideration of the communications, including the preparation of compilation and synthesis documentation; and
- (e) To ensure that the Conference of the Parties has sufficient information to carry out its responsibilities to assess the overall aggregated effects of the steps taken by the Parties in the light of the latest scientific assessments concerning climate change, and to assess the implementation of the Convention.

### **Scope**

2. In accordance with Article 12.1, the communication should include:

- (a) A national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, to the extent its capacities permit, using comparable methodologies to be promoted and agreed upon by the Conference of the Parties;
- (b) A general description of steps taken or envisaged by the Party to implement the Convention; and
- (c) Any other information that the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its communication, including, if feasible, material relevant for calculations of global emission trends.

### **National circumstances**

3. In presenting the information, non-Annex I Parties should specify their national and regional development priorities, objectives and circumstances on the basis of which they will address climate change and its adverse impacts. The description of these circumstances can cover a wide range of information. In addition to information which can be conveniently presented in a table (see table I below), Parties may present basic economic, geographic and climatic information, as well as other factors relevant to climate change of any nature, such as, for example, features of their economy which may affect their ability to deal with climate change.

4. Parties may provide a brief description of existing institutional arrangements which are relevant to the preparation of the inventory on a continuing basis, or a list of perceived deficiencies in this area.

5. Parties may also present information on their specific needs and concerns arising from the adverse effects of climate change and/or the impact of the implementation of response measures, specially on:

- (a) Small island countries;
- (b) Countries with low-lying coastal areas;



- (c) Countries with arid and semi-arid areas, forested areas and areas liable to forest decay;
- (d) Countries with areas prone to natural disasters;
- (e) Countries with areas liable to drought and desertification;
- (f) Countries with areas of high urban atmospheric pollution;
- (g) Countries with areas with fragile ecosystems, including mountainous ecosystems;
- (h) Countries whose economies are highly dependent on income generated from the production, processing and export, and/or on consumption of fossil fuels and associated energy-intensive products;
- (i) Landlocked and transit countries; and
- (j) Other special considerations foreseen in Article 4.9 (least developed countries) and Article 4.10 (fossil-fuel dependency), as appropriate.

6. In presenting the information, wherever applicable, Parties should present numerical indicators. For example, they might present data expressed in terms of a affected percentage of land area, population, gross domestic product (GDP), etc.

### **Inventory**

7. There is a clear need for adequate and additional financial resources, technical support and technology transfer to supplement the efforts towards capacity building for preparation of the national inventories.

8. The Guidelines for the National Greenhouse Gas Inventories and Technical Guidelines for Assessing Climate Change Impacts and Adaptation or the simplified default methodologies adopted by the Intergovernmental Panel on Climate Change (IPCC) should be used by non-Annex I Parties, as appropriate and to the extent possible, in the fulfillment of their commitments under the Convention.

9. Information should be provided on the following greenhouse gases: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O), to the extent the Party's capacities permit. In addition, Parties are encouraged to include in their national inventories the fully-fluorinated compounds, as appropriate. Other greenhouse gases included in the IPCC methodology may be included at the discretion of the Parties. Emissions from bunker fuels should be reported separately from national emissions.

10. Parties should strive to present the best available data in a table (see table II below), to the extent their capacities permit, and try to identify the areas where the data may be further improved in future communications through national capacity building. Additional information, such as, for example, expression of the results in terms of socio-economic, geographical indicators deemed relevant by each country, may also be provided.

11. As recognized by the IPCC in its Second Assessment Report, there is still great uncertainty associated with net anthropogenic emissions resulting from activities other than combustion of fossil fuels. Such activities include, *inter alia*, methane emissions from agriculture and waste sectors, coal mining, biomass burning; carbon dioxide emissions from land use change and forestry; and nitrous oxide emissions from a ll sectors. Since the emissions resulting from these activities depend on local circumstances, and make up a large proportion of the national emissions of non-Annex I Parties, such Parties should make efforts to obtain field observation data to decrease the uncertainties associated with the inventory of these emissions, taking into account the further development of the IPCC methodology.

12. It is further recognized that such improvement of the quality of emission data, in addition to improving the transparency and comparability of national emissions inventories, also improves knowledge of the relationship between global emissions and resulting atmospheric concentration of greenhouse gases, and therefore aids significantly the task of estimating the emission limitations or reductions required to achieve a given concentration level of greenhouse gases, the ultimate objective of the Convention.

13. Non-Annex I Parties are thus encouraged to formulate cost-effective national, and where appropriate regional, programmes aiming at the improvement of the quality of local emission factors and appropriate data gathering, and to submit requests for financial and technical assistance to the interim operating entity of the financial mechanism of the Convention in addition to their request for support for the preparation of their initial communications.

14. Non-Annex I Parties should provide the best available data in their inventory. To this end such data should be provided for the year 1994. Alternatively, non-Annex I Parties may provide such data for the year 1990.

#### **General description of steps**

15. In accordance with Article 12.1, each non-Annex I Party should communicate a general description of steps taken or envisaged by the Party to implement the Convention. Taking into account the chapeau of Article 4.1, the initial communication should seek to include, as appropriate:

- (a) Programmes related to sustainable development, research and systematic observation, education and public awareness, training, etc;
- (b) Policy options for adequate monitoring systems and response strategies for climate change impacts on terrestrial and marine ecosystems;
- (c) Policy frameworks for implementing adaptation measures and response strategies in the context of coastal zone management, disaster preparedness, agriculture, fisheries, and forestry, with a view to integrating climate change impact information, as appropriate, into national planning processes;
- (d) In the context of undertaking national communications, building of national, regional and/or sub-regional capacity, as appropriate, to integrate climate change concerns in medium and long-term planning;
- (e) Programmes containing measures the Party believes contribute to addressing climate change and its adverse impacts, including the abatement of increase in greenhouse gas emissions and enhancement of removals by sinks.

#### **Other information**

16. In accordance with Article 12.7 the Conference of the Parties should use the information in initial communications in arranging for the provision to developing country Parties of technical and financial support, on request, in compiling and communicating information under Article 12, as well as in identifying the technical and financial needs associated with proposed projects and response measures under Article 4.

17. Developing country Parties may, in accordance with Article 12.4, on a voluntary basis, propose projects for financing, including specific technologies, materials, equipment, techniques or practices that would be needed to implement such projects, along with, if possible, an estimate of all incremental costs, of the reductions of emissions and increments of removals of greenhouse gases, as well as an estimate of the consequent benefits.

18. Non-Annex I Parties may provide any other information relevant to the achievement of the objective of the Convention, including, if feasible, material relevant for calculation of global emission trends, constraints and obstacles, etc.

#### **Financial and technological needs and constraints**

19. Non-Annex I Parties may describe the financial and technological needs and constraints associated with the communication of information. In particular, and following the recommendations of the Conference of the Parties that have evolved through its subsidiary bodies, the description may cover needs and constraints associated with the further improvement of national communications, including reduction of the margin of uncertainty in emission and removal variables through appropriate institutional and capacity-building.

20. According to national priorities, non-Annex I Parties may include a description of financial and technological needs associated with activities and measures envisaged under the Convention.

21. Information on national technological needs related to measures to facilitate adequate adaptation to climate change may be included in the communication.

22. Information on relevant financial and technological needs relating to the assessment of national, regional and/or sub-regional vulnerability to climate change may be added in the communication. This may include, where appropriate, information related to data-gathering systems to measure climate change effects in particularly vulnerable countries or regions or to strengthen such systems; and identification of a near-term research and development agenda to understand sensitivity to climate change.

23. There is a need to take into full consideration the circumstances and vulnerabilities of developing country Parties, keeping in mind that the extent to which developing countries will effectively implement their commitments under Convention will depend on the effective implementation by developed countries of their commitments under the Convention related to financial resources and transfer of technology.

#### **Timing of submission of the initial communication**

24. In accordance with Article 12.5, the timing of submission of the initial communication is within three years of entry into force of the Convention for that Party or of the availability of financial resources in accordance with Article 4.3.

#### **Structure and executive summary**

25. The information provided in accordance with these guidelines should be communicated by a Party to the Conference of the Parties in a single document. Any additional or supporting information may be supplied through other documents such as a technical annex.

26. The initial communication should include an executive summary that would present the key information and data from the full document. The executive summary will be translated and distributed widely. It would be useful to envisage an executive summary of no more than 10 pages.

#### **Language**

27. The communications may be submitted in one of the official languages of the United Nations. Non-Annex I Parties are also encouraged to submit, to the extent possible and where relevant, a translation of their communications into English.

**Table I. National circumstances**

Criteria	1994
Population	
Relevant areas (square kilometers)	
GDP (1994 US\$ )	
GDP per capita (1994 US\$ )	
Estimated share of the informal sector in the economy in GDP (percentage)	
Share of industry in GDP (percentage)	
Share of services in GDP (percentage)	
Share of agriculture in GDP (percentage)	
Land area used for agricultural purposes (square kilometers)	
Urban population as percentage of total population	
Livestock population (disaggregate as appropriate)	
Forest area (square kilometers, define as appropriate)	
Population in absolute poverty	
Life expectancy at birth (years)	
Literacy rate	

**Note:** Parties may also report on the rate of change of the above indicators to the extent possible; data in this table should be as disaggregated as possible and include information on individual sectors.

**Table II. Initial national greenhouse gas inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol**

Greenhouse Gas Source and Sink Categories	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O
Total (Net) National Emission (Gigagram per year)	X	X	X
1. All Energy	X	X	X
<i>Fuel combustion</i>			
Energy and transformation industries	X		X
Industry	X		
Transport	X		
Commercial-Institutional	X		
Residential	X		
Other (please specify)	X	X	
Biomass burned for energy		X	
<i>Fugitive Fuel Emission</i>			
Oil and natural gas systems		X	
Coal Mining		X	
2. Industrial Processes	X		X
3. Agriculture		X	X
<i>Enteric Fermentation</i>		X	
<i>Rice Cultivation</i>		X	
<i>Savanna Burning</i>		X	
<i>Others (please specify)</i>		X	X
4. Land Use Change and Forestry	X		
<i>Changes in Forest and other woody biomass stock</i>	X		
<i>Forest and Grassland Conservation</i>	X		
<i>Abandonment of Managed Lands</i>	X		
5. Other Sources as appropriate and to the extent possible (please specify)	X	X	X

Note 1: X - Data to be presented to the extent the Party's capacities permit (Article 12.1(a)).

Note 2: Non-Annex I national communications will include the information in this table, and a description of assumptions and methods used, and the values of emission coefficients, where these differ from IPCC assumptions, methods and values.

Note 3: Efforts should be made to report the estimated range of uncertainty, where appropriate.

### **Annex 9: Revised Project Planning Matrix**

Summary	Objectively Verifiable Indicators	Means/Source of Verification	Critical Assumptions and Risks
<b>Development Objective</b>			
Produce and Submit China's Initial National Communication	By the end of the project, China has submitted its approved National Communication to the UNFCCC	China listed on the UNFCCC website as having submitted its Initial National Communication	Political environment conducive to UNFCCC's goals
<b>Immediate Objectives</b>			
Immediate Objectives 1 to 5: Prepare sector inventories	Within 20 months of project start, an inventory for each of the five sectors is prepared according to the available guidelines	China's national inventory is presented as a major chapter in China's Initial National Communication	Political environment conducive to UNFCCC's goals; Local institutions have technical capacity to prepare inventory according to guidelines
Immediate Objective 6: Draft National Communication and Incorporate into Development Plans	Activities or actions related to climate change and the Initial National Communication are reflected in development plans that are revised or designed after completion of project activities	Development plans (include reference to relevant actions or activities)	Political environment conducive to UNFCCC's goals
Immediate Objective 7: Public Awareness	Articles in major national newspapers on or reference in broadcast media (radio or TV) to climate change; By the end of the project, the number of references in the mass media to climate change will have be increased	Better understanding on climate change will be achieved among governmental officials, policy makers and the public. Capacity to adopt corresponding action will be strengthened.	Political environment conducive to UNFCCC's goals

## **Annex 10: Incremental Cost Matrix**

### **Baseline**

There is no baseline. China would not undertake any of these activities without an obligation under the UNFCCC.

### **Alternative**

The alternative involves preparation and submission of China's Initial National Communication. The costs of the preparation of the initial national communication, US\$3.50, are considered to be completely incremental.

### **Domestic Benefits (of the Alternative, of the Baseline)**

For the Initial National Communication, the objectives are to (a) enhance capability of China to prepare and develop the national information communication; (b) improve public awareness to climate change and help enhance policy awareness to take into account climate change in national development planning; and (c) formulate response strategies to moderate climate change based on information provided by 1994 emission inventory.

### **Global Benefits (of the Alternative, of the Baseline)**

Initial National Communication: Global commitment to implementing the UNFCCC will be increased, as a key measure to manage and mitigate climate change.

### **Components 1 – 3 (No Baseline)**

<b>BENEFITS/COSTS (1)</b>	<b>B A S E L I N E (2)</b>	<b>A L T E R N A T I V E (3)</b>	<b>Increment (ALTERNATIVE-BASELINE) (4)</b>
<b>Global Environmental Benefits</b>	-	A full, initial national communication will be submitted in a timely manner to the UNFCCC from the Chinese Government	Global commitment to implementing the UNFCCC will be increased, as a key measure to manage and mitigate climate change

<b>Domestic Benefits</b>	-	-	
<b>Component 1</b>			
<b>Activity 1: Energy Sector</b>	None	Inventory of energy sector is a very important component of INC whose primary benefits are global. Reducing high uncertainty indicated by previous studies would complete and perfect the methodology used by IPCC to develop inventory in developing countries and its default data. All these would accelerate taking climate change issues into China national development planning and contribute to global environmental protection. \$0.91millions	\$0.91 millions
<b>Activity 2: Industrial Processes Sector</b>	None	The Activity 2 of Components 1 will consist of a GHG emissions inventory for industrial processes whose primary benefits are global. It will provide data and information for the 1994 base year. The 1994 base year information will help China develop steps to abate future emissions. \$0.47million	\$0.47million
<b>Activity 3: Agriculture Sector</b>	None	The Activity 3 of Components 1 will consist of a GHG emissions inventory for agriculture sector, which will primarily benefit the global environment. It will provide data and information for the 1994 base year. \$0.85million	\$0.85million
<b>Activity 4: Forestry and Land Use Change Sector</b>	None	The Activity 4 of Components 1 will consist of a GHG emissions inventory for Forestry and Land Use Change Sector, which will primarily benefit the global environment. It will provide data and information for the 1994 base year. US\$0.37million	US\$0.37million



<b>Activity 5: Municipal Solid Wastes Sector</b>	None	The Activity 5 of Components 1 will consist of a GHG emissions inventory for municipal solid waste sector, which will primarily benefit the global environment. It will provide data and information for the 1994 base year. US\$0.4million	US\$0.4million
<b>Component 2 &amp; 3 All activities</b>	None	Components 2 and 3 will help to implement the activities of Component 1 and perform the activities to improve public and political awareness and action. US\$0.5million	US\$0.5million
<b>Total Costs (Components 1 – 3)</b>	<b>None</b>	<b>\$3.5 million</b>	<b>\$3.5 million</b>

