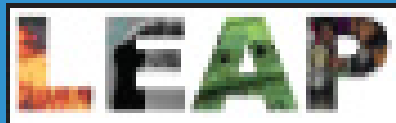


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NCSP MITIGATION  
TRAINING WORKSHOP  
Long-range Energy  
Alternative Planning (LEAP)



CAIRO, EGYPT  
3-7 APRIL, 2006

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## FOREWORD

With great delight, we distribute this report on the first training workshop organised by the National Communications Support Programme (NCSP), which was held 3–7 April 2006 in Cairo, Egypt. The organisation of the workshop would not have been possible without the great support of the Government of Egypt, and particularly the Egyptian Environmental Affairs Agency (EEAA), and we would like to express our gratitude to them.

The training on the Long-range Energy Alternative Planning (LEAP) model was the first in a series of NCSP workshops that is to be organised in response to requests from non-Annex I Parties to the United Nations Framework Convention on Climate Change (UNFCCC). The workshops will form part of an integrated package of technical support services that the NCSP provides to these countries as they prepare their Second (Third, or Initial, as appropriate) National Communications. In collaboration with the Consultative Group of Experts on National Communications from non-Annex I Parties (CGE), the NCSP will provide additional and more in-depth training on particular methods which, along with a wide range of other tools, were introduced at CGE hands-on training workshops.

The LEAP model has been identified by many countries as a useful tool to facilitate mitigation analysis within the framework of the preparation of National Communications. The Cairo workshop was organised in response to the requests of participants at a CGE global hands-on training workshop on mitigation held in Seoul, the Republic of Korea, in September 2005, as well as feedback from a survey of experts that participated at the Seoul workshop and from project coordinators in countries already in the process of preparing Second National Communications.

A total of 33 participants from 19 countries attended the workshop. The training team consisted of Dr. Charles Heaps (Stockholm Environment Institute-Boston), who developed the LEAP model, Nicolas Di Sbroiavacca (Fundacion Bariloche) and Audace Ndayizeye (Nile Transboundary Environmental Action Project).

Owing to the formidable expertise and dedication of the training team, the diligence and enthusiasm of the participants, and the excellent logistic support from the EEAA team led by Dr El-Sayed Sabry Mansour, the workshop concluded with great success. We would also like to take this opportunity to acknowledge the generous financial contribution of the US Environment Protection Agency towards the organisation of the workshop.

We are highly encouraged by the highly positive evaluation of the workshop. We would also like to reassure participants that their valuable comments on the event will be taken very seriously as we plan for future workshops, so that we deliver training courses of even higher standards.

**Martha Perdomo**  
**Global Manager**  
**National Communications Support Programme (NCSP)**  
**UNDP/UNEP/GEF**

## 1. OPENING SESSION

The workshop took place on 3–7 April 2006, in Cairo, Egypt, and was attended by 33 participants from 19 non-Annex I Parties to the UNFCCC (see Annex III for the list of participants). The workshop was officially opened by Dr. Eng El Sayed Sabry Mansour, the UNFCCC National Focal Point and Manager of the Egyptian Climate Change Unit, and Ms. Martha Perdomo, the Global Manager of the NCSP.

Ms. Perdomo reviewed the objectives of the workshop, which was to provide training to assist countries as they conduct their mitigation studies. She thanked the Government of Egypt for all the support provided in the organisation of the workshop.

The course trainers, Dr. Charles Heaps, Nicolas Di Sbroiavacca and Audace Ndayizeye, were introduced. Dr. Heaps, who developed the LEAP model, presented the workshop agenda (see Annex I), which was organised into both lectures and hands-on training exercises. Desktop computers were made available to each participant.



The opening ceremony

## 2. INTRODUCTION TO THE ACTIVITIES OF THE NCSP

Ms. Perdomo provided information on the main objective of the NCSP and outlined the programme's implementation strategy. The objective is to provide technical support to 130 non-Annex I countries by: (i) facilitating the preparation of Second National Communications, (ii) preparing and disseminating technical- and policy-relevant materials, and (iii) promoting knowledge management, best practices, communication and outreach.

The implementation strategy of the NCSP focuses on maintaining close linkages with the UNFCCC and its Subsidiary Bodies, developing and delivering an integrated package of cost-effective and country needs-driven technical- and policy-relevant support services, implementing a rigorous outreach and communications strategy, and promoting the exchange of knowledge, experiences and good practices, while drawing synergies with relevant activities undertaken within other initiatives. The NCSP is funded by the Global Environment Facility (GEF) and implemented jointly by the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP).

During the discussion that followed the presentation, participants expressed their interest in tools and models for vulnerability and adaptation assessments and requested an in-depth training on those tools and models. They also requested assistance with greenhouse gas emission estimations.

## 3. COUNTRY PRESENTATIONS

Countries were invited to share their experiences in carrying out mitigation assessments for their Initial National Communications.

In **Albania**, the first greenhouse gas emission mitigation analysis was undertaken within the framework of the Initial National Communication. The analysis consisted of the development of a baseline and mitigation scenarios that used 1994–2020 as the time horizon and took into consideration national macro-economic projections. Both LEAP and GACMO (Greenhouse Gas Costing Model) were used to develop the mitigation analysis for the energy and transport sectors, and Albania found LEAP very useful in this respect.

**Macedonia** has been implementing its Second National Communication since March 2005. The national greenhouse gas inventory is under preparation, with priority being given to carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) emissions, in line with the Intergovernmental Panel on Climate Change (IPCC) guidelines. Work on the mitigation analysis is expected to begin in the second half of 2006. The National Action Plan is primarily oriented towards reduction of greenhouse gases, taking into consideration the generation of positive effects on the national economy, while minimising the costs of greenhouse gas abatement and achieving reliability and competitiveness in the energy supply, food and other strategic resources.

**Niue** is a very minor producer of greenhouse gas emissions. Nonetheless, a group of experts was put in place for the mitigation assessment to analyse the sectors of energy and industry, transport, forestry, water resources and waste. Although some mitigation options can be easily and readily implemented, there is a need for capacity building in order to do so.

In **Zimbabwe**, an Initial National Communication was successfully produced and included assessment of the following mitigation options: introduction of more efficient, coal-fired boilers; increase in the use of hydroelectricity; introduction of afforestation for carbon sequestration; introduction of minimum tillage; promotion of new and renewable sources of energy; and introduction of biogas digesters and photovoltaic technology. Zimbabwe faces many problems with its mitigation assessments, however, such as inadequate local expertise and scant activity data.

In **Botswana**, the mitigation analysis in the Initial National Communication was undertaken for both the energy and non-energy sectors up to 2030, with a short-term scenario considered for 1994–2005. The baseline scenario was constructed using the Macro-Economic Model for Botswana (MEMBOT), the Botswana Energy Master Plan (BEMP) and LEAP. Mitigation costing was performed using GACMO. For the Second National Communication, Botswana aims to build more capacity within governmental organisations.

During the discussion that followed the country presentations, participants shared their experiences in dealing with public awareness and measuring its impact, effective use of consultants and transboundary impacts. Poor expertise in applying appropriate tools for mitigation assessments was considered as a major constraint and training on the use of these tools was considered a priority.

## 4. REVIEW OF MITIGATION UNDER THE UNFCCC

The presentation and discussions in this session focused on the science of climate change, the definition, scope and benefits of greenhouse gas mitigation, the UNFCCC guidelines on mitigation, and methodological approaches for mitigation assessments.

The different actions needed for the preparation of mitigation assessment were described. They are:

- Definition of time frame (typically long-run).
- Definition of scope (e.g., energy demand and supply, agriculture, land-use, forestry, solid waste, geological sequestration).
- Definition of participants and key stakeholders (e.g., policy-makers, scientific community, non-governmental organisations).
- Definition of desired results.
- Selection of methodologies consistent with available data and expertise.
- Standardisation of key parameters (e.g., base year, end year, discount rate).
- Definition of project boundaries.

- Definition of the baseline and mitigation scenarios.

The steps required for implementing a mitigation assessment were then described. They are:

- Collecting data.
- Assembling base year/historical data on activities, technologies, practices and emission factors.
- Calibrating base year to standardised statistics, such as the national energy balance or national greenhouse gas emissions inventory.
- Preparing baseline scenario(s).
- Screening mitigation options.
- Preparing mitigation scenario(s) and sensitivity analyses.
- Assessing impacts.
- Developing a mitigation strategy.
- Preparing reports.

When conducting the mitigation assessment, links should be established with the greenhouse gas inventory and vulnerability and adaptation assessments in the national communication. Data and assumptions should be consistent with national plans.

The timeframe of the mitigation assessment should be long-term enough to reflect the economic lifetime and potential for stock turnover of major technologies. It was acknowledged that in non-Annex I countries a shorter-term assessment might be more appropriate, since long-term projections can be associated with a large margin of uncertainties. Mitigation assessment also requires

a wide range of expertise – statisticians, energy policy experts, engineers and modellers are among those needed.

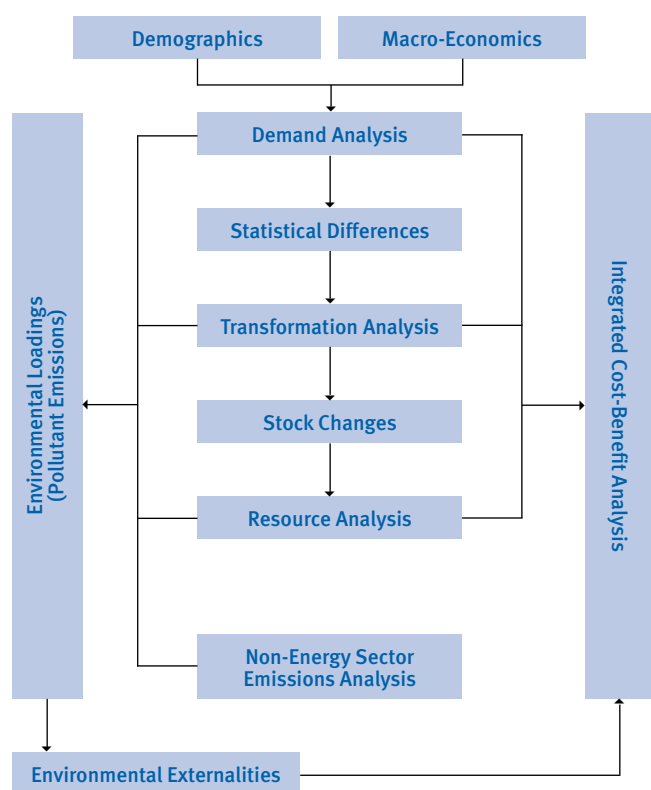
Finally, a screening of the mitigation options is needed to enable an assessment of the potential feasibility of various options, technologies and policies that have been identified.



View of participants during the workshop

## 5. METHODS AND TOOLS FOR MITIGATION ASSESSMENT

The trainers presented various approaches for greenhouse gas mitigation assessments in the energy sector, both top-down and bottom-up, and briefly explained MARKAL, ENPEP, RETScreen and LEAP as tools used for mitigation assessment before describing LEAP in more detail.



### LEAP structure

The LEAP model can be used for: (i) energy and environmental outlooks (forecasting); (ii) energy balances and environmental inventories; (iii) integrated resource planning; (iv) transport and device stock turnover models; and (v) greenhouse gas mitigation assessments.

Participants were then given the floor for questions and comments. A variety of issues were raised, including the use of LEAP in calculating geological sequestrations of CO<sub>2</sub>, clarification on project boundaries, the number of sectors to be included in LEAP, the difference between the baseline scenarios, and the ranking of options. Comments and discussion concentrated, however, on the use of top-down and bottom-up approaches, the appropriate tools for non-Annex I countries, the relationship between LEAP and other models, the minimum data

requirements for LEAP (i.e., energy balances), how LEAP is constructed and how it can be accessed, and how to feed data to LEAP from Excel. Participants were given sufficient clarifications on the questions raised.

## 6. HANDS ON TRAINING

### 6.1 Screening Mitigation Options

The screening exercises were designed to introduce the participants to the basic techniques used in a greenhouse gas mitigation assessment. Participants first undertook an exercise to learn some of the skills needed to conduct a mitigation assessment. In the second exercise, participants used LEAP to create a simple greenhouse gas mitigation scenario by taking data developed in the first screening exercise and using it as the input to LEAP's dynamic integrated energy and greenhouse gas mitigation analysis. Participants were then able to use LEAP to create the charts and tables that are typically included in the mitigation section of the National Communication.

### 6.2 LEAP Training

These training exercises were designed to introduce participants to LEAP and how the model can be applied to energy and environmental analysis. The exercises covered in-depth energy demand analysis, transformation analysis, environment and cost-benefit analysis.

#### 6.2.1 Energy demand analysis

The participants were able to learn how to:

- introduce the basic elements of energy demand analysis and the projection of energy requirements into LEAP;
- develop energy demand analysis for household, industry, transport and the commercial building sectors.

#### 6.2.2 Transformation, environment and cost-benefit analysis

These exercises covered the:

- development of a transformation data set to examine charcoal production, electricity generation, oil refining and coal mining;
- creation of scenarios;
- evaluation of individual policy and technical options, such as co-generation, energy efficiency standards, and switching of power plants from coal to natural gas;
- evaluation of costs associated with selected policy and technical options; and
- calculation of environmental loadings.

In addition, participants learned how to:

- explore alternative scenarios in an open-ended fashion;
- use LEAP transportation analysis features to construct a range of scenarios that examine different policies for reducing fuel use and pollution emissions from the transport sector.

Because the session took longer than planned, training in the use of in-country data development was not covered. However some countries, such as Albania, were able to use their own data during the hands-on training exercises.

### 6.3 Training Session Wrap-Up

Discussions and comments in this session focused on improving in-depth understanding of how LEAP performs cost-benefit analysis, the possibility of using LEAP to undertake more complex studies, such as the effects of emissions on health, and the creation of synergies between LEAP users in different countries. The participants also expressed the need for a document or glossary explaining the technical terminology for LEAP.



**Participants during hands-on training exercises**

The trainers also gave further explanations on dealing with transport costing, oil refineries and cement production, and other information that could help participants get the maximum from using LEAP. Practical hints given to participants included:

- The recommendation to create backup copies to use on other computers;
- How to generate energy balances, and the meaning of statistical differences and stock changes;
- How to use historical data.

A CD containing the LEAP model and all the materials presented at the workshop was distributed to participants, together with a registration code for using LEAP.

## 7. WORKSHOP EVALUATION AND RECOMMENDATIONS

The participants expressed their overall satisfaction on the training approach of the workshop, the structure and content. However, some wanted more training (e.g., 10 days) and a greater opportunity to use country data. Many participants also expressed the need for additional training specific to country needs (see Annex II for participants' workshop evaluation and recommendations).

In response, the trainers plan to develop a specific additional exercise as part of the workshop format in order to use country data, starting with the energy balances of participating countries. This will allow them to incorporate this data into LEAP and run at least one scenario.

In addition, the participants expressed their interest in training courses on other mitigation models for the agriculture and land use, land-use change and forestry sectors.

## 8. CLOSING CEREMONY

The training workshop was officially closed by Dr. Eng El Sayed Sabry Mansour. All participants were particularly commended on the high level of commitment and enthusiasm they demonstrated throughout the week. Certificates were distributed to all participants who successfully completed the workshop.

## ANNEX I: WORKSHOP AGENDA

DAY 1: MONDAY	
9:00 – 9:15	<p><b>Opening Statements:</b></p> <ul style="list-style-type: none"> <li>• Dr. El-Sayed Sabry Mansour, Manager, Climate Change Unit, Egyptian Environmental Affairs Agency, UNFCCC National Focal Point, Co-ordinator of Egyptian DNA</li> <li>• Ms. Martha Perdomo, Global Manager, National Communications Support Programme (NCSP), UNDP/UNEP/GEF</li> </ul> <p><b>Agenda, Introduction, Objectives:</b></p> <ul style="list-style-type: none"> <li>• Dr. Charles Heaps, Stockholm Environment Institute, Boston</li> </ul>
9.15-9.30	<p><b>An Introduction to the Activities of the NCSP</b></p> <ul style="list-style-type: none"> <li>• Ms. Martha Perdomo, Global Manager of the NCSP</li> </ul>
9:30 – 10:30	<p><b>Background: Greenhouse Gas Mitigation Assessment (lecture):</b> An introduction to greenhouse gas mitigation assessments in the context of preparing national communications to the UNFCCC</p>
Break	
10:45 – 12:00	<p><b>Country Presentations: Experiences with Mitigation Assessment in the Initial National Communications</b> Participants from countries that had submitted an Initial National Communication to the UNFCCC gave a short (15 min) presentation on how these were developed, including: What methodologies were adopted? What models (if any) were used? What were the challenges? How will lessons learned from the Initial National Communication be used for the Second National Communication?</p> <ul style="list-style-type: none"> <li>• Albania (Besim Islami)</li> <li>• Macedonia (Anton Causevski)</li> <li>• Niue (James Poihega)</li> <li>• Zimbabwe (Zivayi Chiguvare)</li> <li>• Botswana (Balisi Justice Gopalang)</li> <li>• Q &amp; A</li> </ul>
Lunch	
13.00-14.00	<p><b>Models and Methods for Mitigation Assessments:</b> An overview of the types of models available, their strengths and weaknesses.</p>
14.00 – 15:00	<p><b>An introduction to LEAP (talk and demonstration)</b></p>
Break	
15:15 – 17:00	<p><b>Hands-On Exercises, Part 1: Screening Mitigation options:</b> A simple initial exercise will use a spreadsheet to develop a static screening of mitigation options. Screened options will then be inputted into a partly completed LEAP data set.</p>
DAY 2: TUESDAY	
9:00 – 10:30	<p><b>Hands-On Exercises, Part 2: An Introduction to LEAP</b> Exercise 1 of the LEAP Training Exercises, which teaches the basic skills required for using LEAP.</p>
Break	



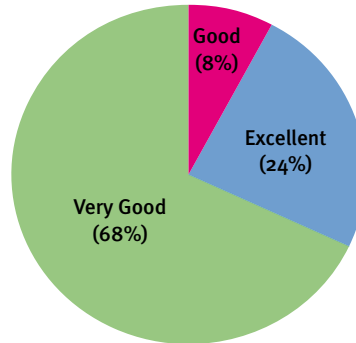
10:45 – 12:00	Hands-On Exercises, Part 2 (continued)
Lunch Break	
13.00 – 15:00	Hands-On Exercises, Part 2 (continued)
Break	
15:15 – 17:00	Hands-On Exercises, Part 2 (continued)
<b>DAY 3: WEDNESDAY</b>	
9.00-10.30	<b>Hands-On Exercises, Part 3: Energy Demand Analysis</b> Lecture followed by more in-depth exercises to teach advanced skills for energy demand analysis.
Break	
10.45-12.00	Hands-On Exercises, Part 3 (continued)
Lunch Break	
13.00 – 15:00	Hands-On Exercises, Part 3 (continued)
Break	
15:15 – 17:00	<b>Hands-On Exercises, Part 4: Transformation, Environment and Cost-Benefit Analysis</b> Lecture followed by in-depth exercises to teach advanced skills for transformation, environment and cost-benefit analysis.
<b>DAY 4: THURSDAY</b>	
9:00 – 10:30	Hands-On Exercises, Part 4 (continued)
Break	
10:45 – 12:00	Hands-On Exercises, Part 4 (continued)
Lunch Break	
13.00 – 15:00	<b>Initial Development of Country Mitigation Assessments:</b> Lecture followed by discussion of data requirements, data structures, basic parameters, management of study, reporting requirements, etc.
Break	
13.15 - 17:00	<b>In-Country Data Development:</b> Introduction to developing a LEAP data set for national GHG mitigation assessments.

<b>DAY 5: FRIDAY</b>	
<b>9:00 – 10:30</b>	<b>In-Country Data Development (continued)</b>
<b>Break</b>	
<b>10:45 – 12:00</b>	<b>In-Country Data Development (continued)</b>
<b>Lunch Break</b>	
<b>13.00 – 15:00</b>	<b>Country Presentations on Progress so Far:</b> A chance for participants to present their thoughts on what type of mitigation assessment might be possible in their countries (how complex?, how detailed?, what type of mitigation options might be considered?), to discuss the main challenges (e.g., data availability, institutional capacity and coordination) and the type of support they will require.
<b>Break</b>	
<b>15:15 - 17:00</b>	<b>Wrap-up and assessment of workshop</b>

## ANNEX II: PARTICIPANTS' WORKSHOP EVALUATION AND RECOMMENDATIONS



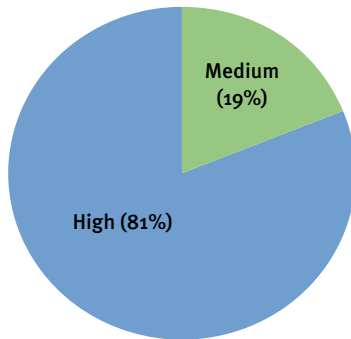
**PRE-WORKSHOP COMMUNICATIONS**  
(It would have been helpful to have a brief note on worked examples and definitions concepts sent to participants ahead of the course.)



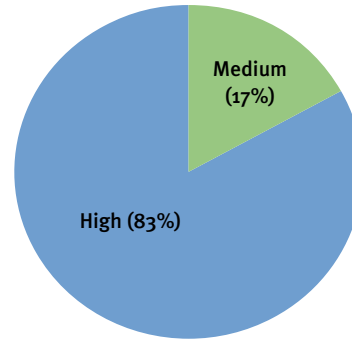
**OVERALL APPROACH OF THE WORKSHOP**  
(More time would have helped; better preparation before the course and follow-up assistance would be appreciated.)



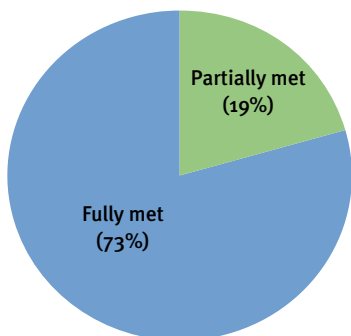
**OVERALL STRUCTURE OF THE WORKSHOP**  
(The pace of the exercises could be adjusted to the time available to ensure all exercises are covered. One complete exercise should be explained through on screen.)



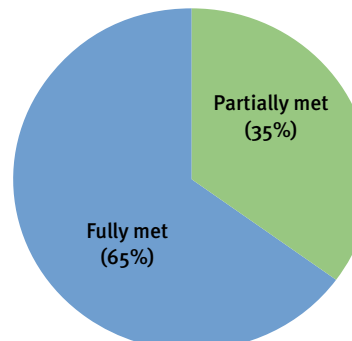
**LEVEL OF RELEVANCE AND CLARITY OF PRESENTATIONS**  
(Exercises could be presented in an easier-to-understand manner; session reviews after presentations could be helpful.)



**LEVEL OF EFFECTIVENESS OF HANDS-ON EXERCISES**  
(More time could have helped every participant to go through the exercises.)



**LEVEL OF RELEVANCE AND CLARITY OF PRESENTATIONS**  
(Perhaps two weeks, instead of one, is needed to allow participants to work through all the exercises; more facilitators during hands-on exercises could be helpful; the last day could be devoted to working through one exercise for the entire group.)



**YOUR EXPECTATIONS FROM THE WORKSHOP**  
(Additional workshops on other models for land use change and for agro-forestry are needed; relevant field visits would be helpful; more discussions to conceptualise the subset material would be helpful.)

## ANNEX III: LIST OF PARTICIPANTS

### Albania

Mr. Besim Islami  
Energy Expert  
GHG Inventory Team Leader  
UNDP-GEF Climate Change Program  
Climate Change Unit/Program  
Ministry of Environment, Forests and Water  
Administration  
Rruga Duresit; No. 27  
Tirana, Albania  
Tel: +355-68-202-9754  
Fax: +355-422-5101  
Email: besimgosa@yahoo.com

Ms. Mirela Kamberi  
Programme Officer  
UNDP-GEF Climate Change Program  
Climate Change Unit, Ministry of Environ-  
ment, Forests and Water Administration  
Rruga Duresit; No. 27  
Tirana, Albania  
Tel: +355-68-202-9754  
Fax: +355-422-5101  
Email: mkamberi@icc-al.org

### Bosnia & Herzegovina

Mr. Begovic Zdravko  
Assistant Ministry for Ecology RS  
Focal Point for Climate Change  
Ministry of Physical Planning and Ecology  
Vladike Platona b.b.  
Banja Luka, Bosnia and Herzegovina  
Tel: +51-316-156/7  
Fax: +51-316-174  
Email: zb\_minurb@blic.net

### Botswana

Mr. Balisi Justice Gopolang  
Senior Meteorologist  
Climate Change Secretariat  
Meteorological Services  
P.O. Box 10100  
Gaborone, Botswana  
Tel: +267-395-6281  
Fax: +267-395-6282  
Email: bgopolang@gov.bw

Ms. Keitumetse Monaka  
Meteorologist  
Climate Change Secretariat  
Meteorological Services  
P.O. Box 10100  
Gaborone, Botswana  
Tel: +267-395-6281  
Fax: +267-395-6282  
Email: kmonaka@gov.bw

Mr. Hornby Tumisang  
National Climate Change Committee Member  
Botswana Technology Centre  
Private Bag, 0082

Gaborone, Botswana  
Tel: +267-360-7616  
Fax: +267-397-4677  
Email: hornby@botec.bw

### Côte d'Ivoire

Dr. Achy Mathieu Assa  
Energy Consultant  
University of Abidjan, Cocody  
22 BP 971  
Abidjan 22, Côte d'Ivoire  
Tel: +225-0709-3685  
Fax: +225-0822-749-380  
Email: mathieuassa@yahoo.fr

### Democratic Republic of Congo

Mr. Aime Mbuyi Kalombo  
Division Head – Climate Change  
Ministry of Environment, Nature Conserva-  
tion, Waters and Forests  
Sustainable Development Directorate  
35, Avenue Pumbu  
Commune de la Gombe  
Kinshasa, Democratic Republic of Congo  
Tel: +243-81-982-4410  
Fax: +243-88-43675 (UNDP)  
Email: Mbuyi\_kalombo@yahoo.fr

### Georgia

Mr. Nikoloz Nephariдзе  
Senior Specialist / IT Expert  
Climate Change Unit, Ministry of Environ-  
mental Protection and Natural Resources  
6 Gulua Str.  
Tbilisi 0114, Georgia  
Tel: +995-32-507-046  
Fax: +995-32-507046  
Email: niko@telenet.ge

Ms. Marina Shvangiradze  
Co-ordinator SNC Project  
Ministry of Environmental Protection and  
Natural Resources  
Climate Change Unit  
6 Gulua str.  
Tbilisi 0114, Georgia  
Tel: +995-32-507-047  
Fax: +995-32-507047  
Email: mshvangiradze2@gol.ge

### Haiti

Mr. Bétonus Pierre  
Director of Energy Resources  
Coordinator Inventory and  
Mitigation Study  
Climate Change Program  
Bureau of Mines and Energy  
Port-au-Prince, Haiti  
Tel: +509-246-1163/246-3946  
Fax: +509-246-2248  
Email: bpierre72@yahoo.com

### Kuwait

Mr. Mohammad Mendekar  
Environment Controller  
Ministry of Energy, Kuwait  
Tel: +965-499-5856  
Fax: +965-499-58011  
Email: mendekar@hotmail.com

### Kyrgyzstan

Mr. Shamil Iliasov  
Senior national GHG inventory expert  
UNDP/GEF Project "Enabling Activities  
In Climate Change: SNC"  
968 Kiyevskaya Str. 4th floor  
720040 Bishkek, Kyrgyzstan  
Tel: +996-312-623732  
Fax: +996-312-623762  
Email: ccproject@up.elcat.kg

### Liberia

Mr. Jacob Sandikie  
National Consultant – Energy Sector  
Environmental Protection Agency of Liberia  
4th Street, PO Box 4024  
Monrovia, Liberia  
Tel: +231-6-578336  
Email: saawallo@yahoo.com

### Macedonia

Mr. Nikola Bitrak  
Research Assistant  
Macedonian Academy of Sciences and Arts  
Krste Misirkov 2  
P.O. Box 428  
Skopje, Republic of Macedonia  
Tel: +389-2-323-5426  
Fax: +389-2-323-5423  
Email: nbitrak@manu.edu.mk

Mr. Anton Causevski  
Assistant Professor  
Faculty of Electrical Engineering  
Karpos II bb PO Box 574  
1000 Skopje, Republic of Macedonia  
Tel: +389-2-309-9183  
Fax: +389-2-306-4262  
Email: caus@etf.ukim.edu.mk

### Madagascar

Mr. Bertin Andriamanantsoa  
Engineer, Direction de l'Energie  
Ministère de l'Energie et des Mines  
Ampandrianomby – Antananarivo B.P. 896  
Madagascar  
Tel: +261-20-40469  
Email: bertinden@yahoo.fr

### Moldova

Ms. Iulia Dupleva  
Scientific Researcher  
Institute of Power Engineering  
Academy of Sciences of the Republic of  
Moldova

## Moldova (cont.)

Chisinau, Moldova  
Tel: +373-22-310-294  
Fax: +373-22-31-294  
Email: dolly\_md\_28@yahoo.ca

## Morocco

Mr. Abdellatif Touzani  
Professor, Ecole Monhamadia d'Ingenieurs  
Avenue Ibn Sina. BP 765 Agdal  
Rabat, Morocco  
Tel: +212-64-895-208  
Fax: +212-37-778-853  
Email: atouzani@emi.ac.ma or  
anassla@menara.ma

## Niue

Mr. James Poihega  
Team Expert Leader  
GHG Working Group for Niue SNC  
Government of Niue  
P.O. Box 82, Hannan Airport  
Alofi, Niue  
Tel: +683-4692 / 4196  
Fax: +683-4602  
Email: sia\_poihega@yahoo.com.au

## Uzbekistan

Mr. Aleksey Armashev  
Tashkent, Uzbekistan  
Tel: +998-711-354-301  
Email: info@climate.uz or to\_te@iplus.uz

## Zambia

Mr. Kenneth Nkowane  
Director, Department of Environment and  
Natural Resources  
P.O. Box 34011, Kwacha House  
Lusaka, Zambia  
Tel: +260-096, 780085  
Fax: +260-1-229417  
Email: kapalakonje@yahoo.com

Mr. Christopher Kashinga  
Senior Inspector – Air and Water Pollution  
Environmental Council of Zambia  
PO Box 35131  
Lusaka, Zambia  
Tel: + 260-1-254023/59  
Fax: + 260-1-254164  
Email: ckashinga@yahoo.com

## Zimbabwe

Dr. Zivayi Chiguvare  
University of Zimbabwe  
Faculty of Engineering (Renewable Energy  
Programme)  
P.O. Box MP 167, Mt. Pleasant  
Harare, Zimbabwe  
Tel: +263-4-303211 ext 1380  
Fax: +263-4-702-758  
Email: chiguvare@eng.uz.ac.zw or  
zivayi\_chiguvare@yahoo.com

## Egypt

Dr. El-Sayed Sabry Mansour  
UNFCCC National Focal Point  
Manager, Climate Change Unit  
Co-ordinator of Egyptian DNA  
Egyptian Environmental Affairs Agency  
Ministry of Environmental Affairs  
Cairo, Egypt  
Email: esmansour@eeaa.gov.eg

Dr. Mohamed El-Shahawy  
Project Manager SNC Egypt  
Egyptian Environmental Affairs Agency  
University of Cairo, Faculty of Science-  
Meteorology & Astronomy Dept.  
Tel: 202- 531-4926  
Fax: 202 525-6454  
Email: mshahawy2000@yahoo.com

Mr. Samir Tantawi  
Environment Researcher  
Egyptian Environmental Affairs Agency  
Member of Egyptian Bureau for CDM  
Cairo, Egypt  
Tel/Fax: +202-817-3892  
Email: samir\_tantawi@hotmail.com

Eng. Saber Mahmoud Osman  
Researcher – Climate Change Unit  
Egyptian Environmental Affairs Agency  
Email: Saber\_cc@hotmail.com

Eng. Mohamed Abd elaal  
Researcher – Climate Change Unit  
Egyptian Environmental Affairs Agency  
Email: mabdall-ccu@hotmail.com

Eng. Ahmed Rashad Mohamed  
Researcher – Climate Change Unit  
Egyptian Environmental Affairs Agency  
Email: arashad81@yahoo.com

Eng. Sayed Mohamed Emam  
Under Secretary  
Ministry of Electricity and Energy  
Email: emamsayed@hotmail.com

Eng. Maged Safwat  
Electrical Engineer  
Ministry of Electricity and Energy

Eng. Ehab Ismail  
Electrical Engineer  
New and Renewable Energy Authority  
Ministry of Electricity and Energy

## TRAINERS

Mr. Nicolas Di Sbroidavacca  
Petroleum Engineer and MSc Energy and  
Environment Economy  
Fundación Bariloche  
Av. Bustillo 9,5 Km  
Bariloche, Rio Negro

Argentina  
Tel: +54-2944-462-500  
Fax: +54-2944-462-500  
Email: ndisbro@bariloche.com.ar

Dr. Charles G.F. Heaps  
Senior Scientist  
SEI-Boston/Tellus Institute  
11 Arlington St  
Boston, MA 02116, USA  
Tel: 617-266-5400  
Fax: 617-266-8303  
Email: cheaps@tellus.org

Mr. Audace Ndayizeye  
Nile Transboundary Environmental  
Action Project  
B.P 6084 Kinindo, Bujumbura  
Burundi  
Tel: +257-939-354  
Fax: +257-239-045  
Email: audace\_ndayizeye@yahoo.fr

## ORGANISERS

**National Communications Support  
Programme  
UNDP/GEF  
304 East 45th St, 9th Floor  
New York, NY 10017**

Ms. Martha Perdomo  
Global Manager  
Tel: +1-212-906-5006  
Fax: +1-212-906-6998  
Email: martha.perdomo@undp.org

Margarita Arguelles  
Programme Associate  
Tel: +1-212-906-6862  
Fax: +1-212-906-6998  
Email: margarita.arguelles@undp.org

**Climate Change Unit  
Egyptian Environmental Affairs  
Agency  
30 Misr Helwan El-Zyrae Rd  
Maadi, Cairo**

Dr. El-Sayed Sabry Mansour  
UNFCCC National Focal Point  
Manager, Climate Change Unit  
Egyptian Environmental Affairs Agency  
Email: esmansour@eeaa.gov.eg

Mr. Samir Tantawi  
Environment Researcher  
Egyptian Environmental Affairs Agency  
Member of Egyptian Bureau for CDM  
Tel/Fax: +202-817-3892  
Email: samir\_tantawi@hotmail.com

