The Newsletter of the UNEP Collaborating Centre on Energy and Environment No. 2 November 1991

C2E2 News

UNEP

National Greenhouse Costing Studies - A new UNEP project launched

UNEP has recently launched a major new project aimed at establishing a set of methodological guidelines for calculating the costs of limiting greenhouse gas (GHG) emissions, particularly carbon dioxide from the energy sector. The project is being coordinated by the Centre, with assistance from Caminus Energy (Cambridge, UK) and the Tata Energy Research Institute (New Delhi, India), and with Dr. Michael Grubb of the Royal Institute of International Affairs (London, UK) as consultant.

Assessing the costs involved in limiting greenhouse gas emissions is a highly complex problem. There are many anthropogenic sources, various options for absorbing greenhouse gases, and even human impacts on natural sources to consider. The largest contributing sector at the global level, however, is energy, although agriculture and forestry contribute significantly.

Emissions of CO_2 from the energy sector can be limited or reduced by a variety of means, such as energy savings, fuel switching, and introduction of more efficient technologies. Although some of these measures may be economically attractive in their own right, so-called "no-regrets" options, significant constraints or barriers exist to prevent or hamper the uptake of more energy efficient plant, equipment, vehicles and buildings. Economic incentives to influence the actions of both energy producers and consumers, on the other hand, may need to be so large that they would have important macroeconomic impacts. Furthermore, the long- term nature of any abatement efforts, stretching over several decades, also introduces large uncertainties concerning both technology costs and energy prices.

A number of costing studies have been carried out for various countries and regions. These studies have resulted in estimated costs for greenhouse gas abatement which vary widely, ranging from substantial net savings to costs in trillions of dollars. The differences are at least partly due to differences in assumptions concerning targets for greenhouse gas reduction, baseline projections, data on technology costs, and a range of more subtle differences in modelling assumptions and methodologies. In particular the use of the "bottom-up" or "top-down" modelling approaches tend to give diverging results.

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RISØ

The UNEP Collaborating Centre on Energy and Environment is situated at Risø National Laboratory, Denmark and funded by the Danish International Development Agency (Danida), the United Nations Environment Programme (UNEP) and Risø National Laboratory.
The permanent staff of the Centre:
John Christensen, Head of Centre
Camilo Lim, Energy Economist
Gordon Mackenzie, Senior Energy Planner
Arturo Villavicencio, Senior Energy Scientist
Jette Larsen, Secretary

The work programme of the Centre is concentrated in four areas:
ENVIRONMENTAL IMPACTS of energy production and use in developing countries.
ENERGY POLICY in selected countries and formulation of guidelines for incorporating environmental considerations into energy policy.
INFORMATION on energy-related environmental effects, energy planning methods and models.
SCIENTIFIC AND TECHNICAL SUPPORT to UNEP on energy questions.

In this issue:

Global Environment Facility (GEF)

The Global Environment Facility (GEF) is a three-year pilot programme established by representatives of a group of industrialized and developing countries in Paris in November 1990 to support activities related to international environmental management and transfer of environmentally-benign technologies. Financial support in the form of grants and low-interest loans is given to developing countries to address specific challenges to the environment in four major programme areas: pollution of international waters, loss of biodiversity, ozone depletion and global warming. The total funds available to the Facility at present amount to approximately US$ 1.5 billion.

The World Bank, UNDP and UNEP cooperate in the implementation of GEF, and each institution is responsible for specific tasks which relate to its particular expertise. The World Bank is responsible for the GEF trust fund and the investment operations. UNDP coordinates and manages the financing and execution of pre-investment, as well as playing a key role in identifying projects, communicating with recipient governments, and coordinating with donors at the country level. UNEP provides scientific and technical guidance in identifying and selecting projects and coordinates research and data collection activities. A Scientific and Technical Advisory Panel (STAP) composed of experts from industrialized and developing countries has been convened by UNEP to give advice on broad scientific and technical issues, and has developed a set of criteria and priorities for each of the four programme areas to guide the selection of GEF projects.

The Centre's role in relation to GEF has been to provide UNEP with reviews and evaluations of proposed projects for GEF funding under the Global Warming/Energy programme. As part of this activity, the Centre has established a data base of projects submitted to the GEF in this area to enable it to keep track of the status of projects and to ensure that the technical and scientific design of projects are consistent with the criteria and priorities set by the STAP.

Details of GEF can be obtained from the head offices of the three implementing agencies or, in developing countries, from the UNDP Resident Representative.

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National Greenhouse Costing Studies *(continued)*

The aim of the project is to develop a methodological framework for conducting such studies on the basis of a number of authoritative and comparable national studies and a common analysis of these. The project can thus be seen as a "test bed" of how a framework for national studies can be developed and applied. It is intended to complement other UNEP work on the impacts of climate change and adaptation strategies, and has been prepared in close coordination with IPCC and with the UNCED Secretariat's work on the atmosphere and energy.

National reviews and costing studies will be undertaken for a number of countries which span a range of energy and economic systems and stages of economic development. These national case studies will be carried out by teams in the respective countries, with external assistance where appropriate. The studies will be based as far as possible on common guidelines formulated by the project team.

An Advisory Group of international experts has been established to provide overall guidance to the project, including approving the project guidelines, reviewing the country studies and conclusions, and generally advising the project team of related work. This Advisory Group comprises:

Yusuf Ahmad, UNEP

Jae Edmonds, Battelle Pacific N-W Laboratory, USA

Irving Mintzer, Stockholm Environment Institute, USA

R. K. Pachauri, Tata Energy Research Institute, India

Jayant Sathaye, Lawrence Berkeley Laboratory, USA

Connie Smyser, International Energy Agency

Annibal Villela, Brazil

The project will be initiated with a workshop at Risø on 4 and 5 December 1991 where the Project Team, the National Teams and invited experts will discuss and finalize the project guidelines. A status report will be prepared midway through the project when the reviews of existing national studies have been completed. The project is planned to be completed at the end of 1992 with the publication of a final report describing the country studies and a general methodological framework for future studies.

UNCED and Energy

by *Janos Pasztor,* senior programme officer, UNCED Secretariat

The United Nations Conference on Environment and Development was initiated by the General Assembly Resolution 44/228 in December 1989. The Conference, increasingly being referred to as EARTH SUMMIT, will be held on the 20th anniversary of the 1972 United Nations Conference on the Human Environment, in Rio de Janeiro on June 1-12, 1992. While the 1972 Stockholm Conference, has successfully put the environment on the international agenda, the main objective of the 1992 Conference is to firmly incorporate the environment into the development agenda, across the board, from energy, through agriculture, and into economic and finance policies.

The Conference is expected to have outputs which can be described in 6 major categories: (i) Conventions, (ii) The Earth Charter, (iii) Agenda-21, and three groups of supporting measures in the areas of (iv) Technology, (v) Finance and (vi) Institutions. The Conference should provide the focus for a number of ongoing intergovernmental negotiations, such as on climate change, and biodiversity. These will be negotiated prior to the Conference in fora different from UNCED, and signed or agreed at the Conference. The role of the UNCED is to liaise with these, and to ensure that its broader environment-development mandate will be taken into account.

The "Earth Charter" will be a declaration, setting out the basic principles for the conduct of peoples and Nations towards each other and the Earth to ensure a sustainable common future.

Perhaps the most important output of the 92 Conference will be an agenda for action, "Agenda-21", to provide concrete measures for implementation of overall commitments and objectives negotiated in the different intergovernmental negotiating fora, and of the principles embodied in the Earth Charter, through an agreed international work programme in the period following the Conference and leading into the 21st century.

In order to implement Agenda-21, in many areas new, and appropriate environmentally sound technologies will need to be developed, and existing technologies will need to be made available to developing countries on preferential terms. Equally important will be to enhance the development of human resources, particularly in developing countries, through training, and other capacity development programmes.

The Conference will also need to reach agreement on financial resources and measures for financing the actions provided for in Agenda-21. Agreement is also needed to ensure access by developing countries to the new and additional financial resources required to integrate the environmental dimension into their own development policies and practices, including meeting the incremental costs of participating in international environmental agreements.

Most of the above actions will have institutional implications. Measures will need to be proposed for strengthening existing institutions, the processes of collaboration and co-ordination amongst them and the machinery to enable environment- development issues to be examined at the policy level in their relationship to other important security, economic, humanitarian and related issues.

Energy production, transformation, and energy demand include some of the most important sources of the major environmental »issues» that this Conference has to deal with, including the deterioration of the atmosphere, as well as land degradation, deforestation, just to name a few. The UNCED Preparatory Committee is in the process of negotiating a number of programmes in the area of energy. The final result of these negotiations will only be known at the time of the Conference in June 92. However, it is possible to list the major programmes that are now being considered.

The main thrust in the energy area is the need for a transition to a future global energy system, which will increasingly be relying on efficient energy production and consumption patterns, as well as on Environmentally Sound Energy Systems (ESES). In order to achieve this transition, a number of specific activities are being proposed both for countries, and for the international community. These include increasing efforts at energy development to ensure that developing countries are not constrained in

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their effort at economic development, as well as major programmes of technical cooperation, capacity building and exchange of information. Countries are being urged to increase reliance on renewable ESES, and at the same time to increase energy efficiency efforts in all relevant sectors, especially in transport and industry.

These activities can be reached using a mix of different policy tools available in different countries, including through relevant legislation for efficiency and emission targets, as well as through the appropriate use of economic instruments, such as prices, taxes and subsidies.

The key issue of the lack of appropriate institutional capacity in the UN system to deal with energy issues, such as efficiency and renewables, is also on the agenda. Proposals have been made for strengthening the existing, rather ineffective, and disaggregated institutional structures in the UN, as well as for creating new institutions of various kinds, including a United Nations Agency for Renewable Energy. These institutional proposals, as many others will only be successful, if behind the agreement of the countries, there will be the equivalent financial support. There are many proposals on the table, including the possibility of raising revenues at the international level from the production, international sale or the consumption of fossil fuels.

All of these proposals are very controversial, and we do not know the final outcomes. Yet, even the fact that they are being discussed is a major step forward in the way that the international community has been tackling these issues. The next 8 months will be crucial, and we are all looking forward to June 1992, when an expected 80-100 heads of states will sign Agenda-21, and thereby put the international community on a path which will bring it closer to the direction of sustainable development.

Energy and Environment in Latin America

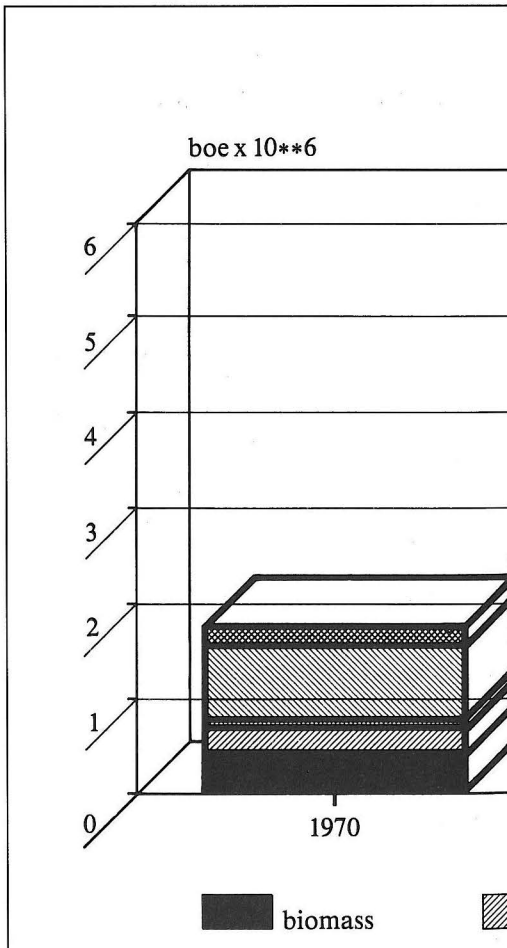
Environmental aspects have not as yet played a major role in the formulation of national energy policy in the Latin American and Caribbean (LAC) region. Economic and technological concerns have dominated discussions of the nature and role of energy use and national energy planning.

The increasing recognition of energy related environmental deterioration at both local and global levels has, however, raised considerable concern about current and future patterns of energy production and use. Although the countries in the region have not contributed significantly in relative terms to the present level of greenhouse gases (GHG) in the atmosphere, it is recognized that the region's share of global emissions are going to increase in the future.

Recent work carried out by the Latin American Energy Organization (OLADE) shows that, in spite of the interruption of growth trends during the first half of eighties, energy consumption in the region is expected to increase by 60% by the year 2000, as a result of population growth and of large suppressed energy needs. According to this "business-as-usual" scenario, energy consumption would be doubled over the next two decades with an increasing share of carbon-based fuels.

The main feature of the energy problem in the region is the fundamental contradiction between the objective of satisfying basic energy requirements to achieve economic growth and social development, and the need to reduce environmental damage related to the growing energy consumption. To achieve a balance between these conflicting goals it is necessary to promote a deeper understanding of the nature and extent of environmental problems so that planners and policy makers could be able to assess the "environmental opportunity costs" of alternative energy policies.

The formulation of methodological guidelines and the establishment of a conceptual basis is one of the priority tasks for incorporating environmental considerations into national energy policy and planning. The Latin American and Caribbean Commission on Development and Environment has underscored the importance of incorporating of the environmental dimension into the medium and long term planning process as one of the mechanisms for achieving a sustainable development.



Source: Energy Forecast Study for Latin America; OLADE, 1990

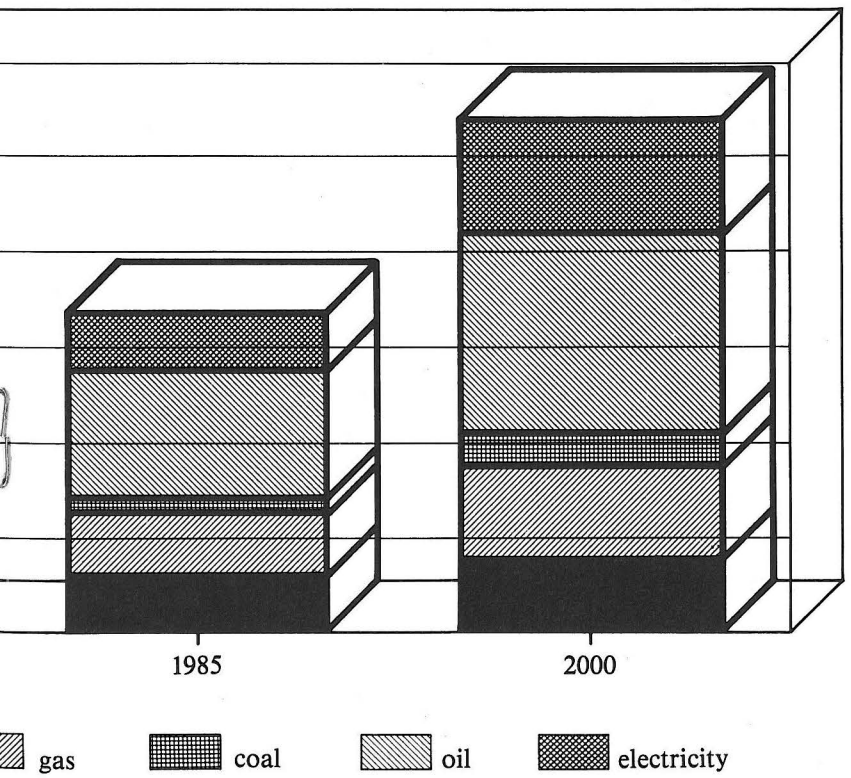
While there is a growing consensus and reasonable understanding of the principles of sustainable energy development, it is difficult to operationalize the concept or identify practical policy guidelines for its realization. Besides general conceptual and methodological problems, the nature of energy-environmental questions involves consideration not only of the physical impacts of energy production and use, but also impacts of a socio-economic and political nature. Therefore, given the interdependencies which exist between energy policy and environmental management and planning, it goes without saying that serious attempts must be made to achieve a system wide integration of the two.

The Centre is collaborating with the National Energy Institute (INE) of Ecuador through a pilot project aimed at supporting and enhancing the technical and political awareness for developing and promoting more environmentally sound energy policy. The objective of the first phase of the project is to establish a national environmental database for Ecuador. This involves the transfer and adaptation of the UNEP/SEI-B Environmental Database (EDB), compilation of specific national data, and incorporation of these data into EDB.

Collaboration with a relatively small country like Ecuador provides an opportunity to develop and test a set of planning tools and guidelines for more general use, and at the same time supports and builds on the energy planning process started by INE some years ago. The project is partly supported by the Commission for the European Communities (DG-I) in the frame of energy planning in developing countries.

On a broader scale the Centre has also recently developed a joint proposal for a new activity programme in collaboration with the Latin American Energy Organization (OLADE) and the Stockholm Environment Institute-Boston Center. The new programme aims at incorporating environmental aspects into energy policy and planning at national level in the Latin American region. The key emphasis of the proposed programme is to establish a database on emission sources and other environmental impacts from energy activities, develop an inventory of present and projected emissions, loads and other environmental impacts and provide planners from national planning institutions with training, tools and methods that will deepen their analytical capabilities. The goal is to reach a wide selection of Latin American countries with these tools and methods, and to provide sufficient sustained training to embed flexible and powerful integrated planning techniques into the day-to-day activities of national planning agencies.

Energy Demand in Latin America



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Asian Energy Institute Workshop in New Delhi.

The Asian Energy Institute (AEI), a networking arrangement of energy institutions in eleven of the major countries in the Asian region, is jointly with the Centre for Science and Technology in Brazil conducting a study on "Asia's and Brazil's contribution to Greenhouse Gas (GHG) Emissions and Policy Responses for their Minimization". The study is sponsored by UNCED, Cicero (Norway), USAID, and Danida (Denmark). In addition the Japanese Institute for Energy Economics and the Rockefeller Foundation, New York have contributed by sponsoring the two initial workshops in Jaipur, India and Bellagio, Italy.

The results of the first phase of the study were presented on 21 and 22 September at a workshop hosted by the Tata Energy Research Institute in New Delhi. The aim of the workshop was twofold: firstly, to present the preliminary results of the national emission assessments and crude costing figures and, secondly, to develop a regional Asian input to the UNCED process on the basis of these findings. In addition to the AEI institutions the meeting was attended by members of the steering committee and representatives of the Stockholm Environment Institute, the International Institute for Applied Systems Analysis (IIASA) and the World Resources Institute. The meeting was inaugurated by the honourable Minister of State for External Affairs (India), Mr Eduardo Faleiro and the final address was given by Mr. Vasant Sathe.

The Centre is represented on the steering committee by John M. Christensen. This regional effort provides valuable input and background information to the Centre's general GHG activities and to the new GHG costing study described in this issue of C2E2 News.

UN Solar Energy Group on Environment and Development (UNSEGED)

The work of the UN Solar Energy Group was introduced in the first issue of C2E2 News. The group established in 1990 by UN-DIEC under the chairmanship of Professor T. B. Johansson (Sweden) has now finalized its report which provides substantive input to the 1992 United Nations Conference on Environment and Development (UNCED).

The report assesses the development of new and renewable energy sources (NRSE) in the last decade and presents recommendations for national and international action to promote more sustainable energy development on the basis of greater utilization of NRSE. The following topics are addressed in the report:

- Assessment of the "lessons learned" in the decade after the Nairobi Programme of Action was established in 1981.
- Overview of the present scientific and technical status of the various technologies available for the utilization of NRSE.
- Analysis of the global potential for and impacts of increased utilization of NRSE.
- A new rationale for the utilization of NRSE based on environment, development and security.
- An agenda for development and utilization of renewable energy sources in the 1990s and beyond.

Among the conclusions and recommendations of the report are:

- Establishment of national timebound targets for the contribution of the different renewable energy sources to the energy supply.
- Introduction of regulatory and fiscal legislation to ensure that all costs and benefits, also social and environmental, are included in economic comparisons or public and private energy sector investments.
- Minimum shares of international funds - from bilateral, multilateral and international agency sources - for energy sector investments to be allocated to renewable energy projects, with this share increasing over time.
- Establishment of a strong international institutional arrangement to coordinate the proposed efforts, preferably in the form of an International Renewable Energy Agency.

Many of the conclusions and recommendations are expected to be included in the documents for UNCED in the area of energy under protection of the atmosphere.

The Centre is represented in the UNSEGED by John M. Christensen.

Environmental Database (EDB)

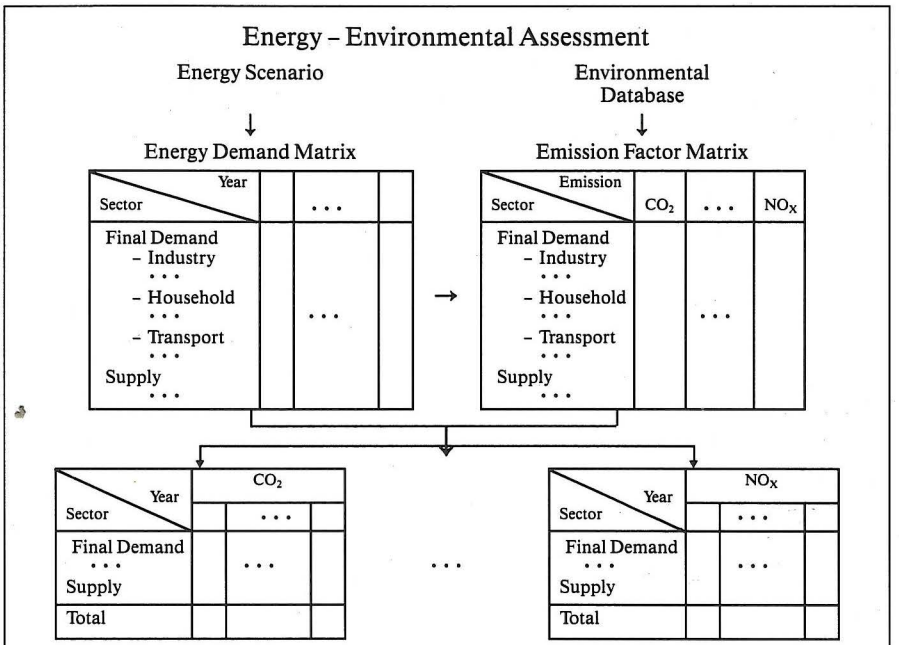
The Environmental Database (EDB) was developed by the Stockholm Environment Institute's Boston Centre with partial funding from UNEP. The Centre and SEI-B share responsibility for developing, maintaining and disseminating EDB under a Joint Host Agreement. SEI-B is responsible for software development and maintenance, while the Centre is in charge of data content and dissemination of the database to institutions in developing countries.

The database contains quantitative information on the environmental effects associated with a wide range of energy production and consumption technologies, in particular emission of gases. Work is continuing at the Centre and at SEI-B to extend the coverage and applicability of the database.

Within the last few months EDB has been installed in Ecuador, Tanzania, Costa Rica and Senegal, and there are plans to make the database available in all Latin American countries through cooperation with OLADE.

Work is continuing on expanding the coverage of the database, by including specific data obtained in the host countries and from other sources such as the European CORINAIR emission inventory. The representation of emissions from the transport sector often presents problems because of the diversity of conditions, vehicle standards, journey types, and other uncertainties. Ranjan Bose is tackling some of these problems during his stay as guest researcher at the Centre, with particular emphasis on urban transport in India and the use of EDB.

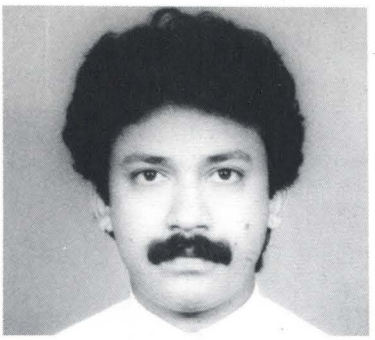
For more information on EDB and details of getting access, contact Gordon Mackenzie (UNEP Centre) or Michael Lazarus, SEI-B, Tellus Institute, 89 Broad Street, Boston, MA 02110-3542, USA.



Schematic illustration of linking between Environmental Database and energy planning models: the EDB allows the calculation of environmental loadings resulting from alternative energy scenarios.

A New Face at the Centre: Ranjan Bose

Dr. Ranjan Bose joined the Centre as Guest Researcher on 1 October for a period of three months. Dr. Bose, who holds degrees in mathematics, statistics and energy planning, is on leave from the Tata Energy Research Institute, New Delhi, India where he has been a Fellow in the Energy Policy Division for the past nine years working on projects relating to energy-environment planning in India and other developing countries. His current areas of interest are: urbanization, motorization and energy environment implications in developing countries; energy demand optimization models in urban areas and estimation of pollution loading.



While at the Centre, Dr. Bose will work on the energy-environment aspects of urban transport in developing countries, with particular focus on Indian cities. The work will be closely tied to ongoing work at TERI on an urban transportation database, and to the development of the Environmental Database at the Centre.

Over the last few years TERI has developed a database on growth of vehicle populations, traffic flow characteristics, occupancy ratios, trip rates, trip lengths, vehicle efficiencies, etc. This database will be used to estimate the future energy requirements and emissions from passenger transport in a number of Indian cities and to explore various scenarios with respect to fuel savings, reduced congestion and reduced emissions. The study will address a number of transport policy issues and options, and will provide a starting point for understanding the environmental implications of energy use for passenger road transport in urban India. In a more general sense, the work will provide a valuable contribution to the Environmental Database (EDB), allowing improved representation and coverage of transport sector emissions for developing countries.

Members of the Management and Policy Committee at their third meeting which took place at UNEP Headquarters on 2 June 1991 (left to right):

Naigzy Gebremedhin (UNEP),
Steen Lilholt (Danida),
Hans Larsen (Risø),
John Christensen (Head of Centre).

C2E2 News provides up-to-date information at regular intervals on the activities of the Centre, UNEP and related events and developments. Information on forthcoming conferences, reports, studies, etc. are welcome.

Editor: Gordon A. Mackenzie
Design: Annelise Ploug, Copenhagen

The views expressed in this newsletter do not necessarily represent those of UNEP.

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