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Energy and Transport Newsletter

Commission on Sustainable Development discusses Energy and Transport

The United Nations Commission on Sustainable Development met at its ninth session (CSD-9) on 16-27 April 2001 at UN Headquarters in New York to discuss progress on policies in Energy, Transport, Atmosphere, Information for Decision Making, and International Cooperation for an Enabling Environment. The Energy and Transport Branch was very active in the preparation of the meeting, and played a key role in facilitating and servicing negotiations.

The high-level meeting attracted a large number of ministers from several different ministries, and all participated actively in the formal discussions and the informal meetings. There were also a large number of other representatives of national Governments, United Nations bodies, and other international organizations as well as representatives of major groups, who made substantive contributions to the meeting.

With regard to Energy, the presentations and discussions highlighted a number of important issues, such as promoting decentralized rural energy (including both off-grid and local mini-grid systems), expanding the contribution of renewable energy and energy efficiency, and supporting energy and infrastructure for poverty alleviation. Financing was seen to be critical for energy systems because of high up-front investment costs.

In the area of Transport, the discussions emphasized such issues as funding for developing transport infrastructure, as

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Chairman Bedrich Moldan opens CSD-9

DESA, UNDP, and GEF Work to Improve Energy Efficiency and Reduce Greenhouse Gases in Egypt

The past decade has witnessed a strong political commitment by the Government of Egypt (GOE) to the improvement of energy efficiency at the national level. Several initiatives and projects have been endorsed and executed to design and implement energy efficiency measures. In 1999, the Egyptian Electricity Holding Company (EEHC), in collaboration with the Organization for Energy Planning (OEP) and with funds from the United Nations Development Programme (UNDP), Global Environment Facility (GEF) and GOE, launched a project aimed at reducing long term greenhouse gas (GHG) emissions for fossil fuel fired thermal power plants, electricity

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Inside this issue:

DESA /World Bank Join to Curb Transport Emissions

The Energy and Transport Branch (ETB) of the Division for Sustainable Development has joined forces with the World Bank to create the Global Initiative on Transport Emissions (GITE), as both a major programme to combat emissions and as part of preparations for the ninth session of the Commission on Sustainable Development (CSD), at which Energy, Transport and Atmosphere were focal themes. The focus of the GITE is to assist Governments in overcoming the institutional, legal, financial, and policy barriers that inhibit existing technology from reaching country fleets. The GITE continues its work with several programmes and activities leading to the World Summit on Sustainable Development, including a number of regional seminars and a series of Car Free Days to promote the use of public transportation. branches: the Transport Emissions Knowledge Initiative (TEKI), the Partnership for Vehicle and Fuel Technology Modernization (PVFTM), and the Small Initiatives Clearinghouse (SIC).

To learn more about the GITE, visit

<www.un.org/gite>

The Transport Emissions Knowledge Initiative (TEKI) is initiating work with national Governments and international agencies to develop an adequate statistical and policy information base, assist in strengthening national institutions responsible for policy formulation, and coordinate with international agencies responsible for establishing international standards.

The TEKI is currently creating an interactive webpage that will act as the foundation for information sharing and as a platform for dialogue on major issues. There are further plans to hold regional workshops on Inspection and Maintenance policy formation, trans-

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Imagining a New City: Bogotá Takes the Lead in UN Car Free Days

As part of its preparation for the World Summit on Sustainable Development, the Energy and Transport Branch, via its Global Initiative on Transport Emissions (GITE), will be working with cities around the world to hold a series of Car Free Days (CFDs) and Training Seminars for Mayors from each region. The first of these CFDs will be held in Bogotá, Colombia, on Thursday, 7 February 2002. Transportation is a key issue of Agenda 21 and, through the GITE, the Energy and Transport Branch hopes to bring new energy into transport policy by inspiring cities around the world to imagine a new path of development. Car Free Days will be used as a public education and awareness tool to promote alternative modes of transport and inspire communities to take a more active role in local transport policy decision-making.

Although transportation contributes substantially to the economic and social development of countries and regions, the widespread use of private vehicles in cities over the last half century has resulted in very large externalities. Not only does the excessive use of private vehicles contribute largely to local and global air pollution, but congestion and traffic lead to loss of productive time and deterioration in the quality of life. In an effort to change the current trajectory, many cities have begun to imagine a new form of urban development where private vehicles are not necessarily the primary mode of transport. Increased use of public transit is essential if cities are to continue to grow without further polluting the air and increasing congestion on the roads. Yet the greatest obstacles lie not in the planning for public transport, but in changing the behavior and attitudes of people. One method of imagining a new city is holding a Car Free Day (CFD) in which the use of private vehicles in banned and citizens are asked to use buses, trains, and taxis to commute, thus allowing them to see that alternative modes of transportation are indeed possible.

800,000 private vehicle were left at home during Bogotá's first Car Free Day. A similar outcome is expected this year.

Car Free Days can be very effective in moving people from single-occupancy vehicles into buses and railways by inspiring enthusiasm for a cleaner, less congested city. One example of a very successful CFD is that of Bogotá, Columbia, held on Thursday, 24 February 2000. The entire city was closed to private vehicles and people were asked

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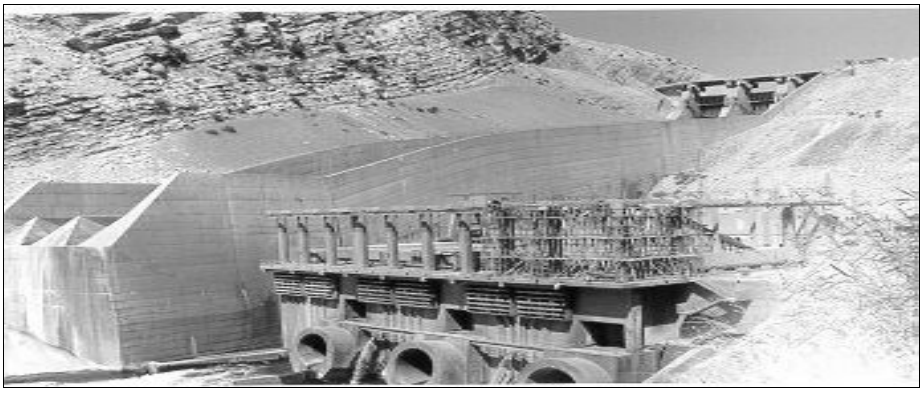
UN DESA Helps Restore Power Infrastructure in Iraq

Since 1997, DESA has acted as the executing agency for the UNDP under the Oil for Food Programme in Iraq, rehabilitating the electricity network damaged in the Gulf and the Iran-Iraq wars in the three northern Governorates and observing activities in the fifteen Governorates of southern and central Iraq. Initially, with limited funding available from the 13% account of the Oil-for-Food Programme, the emphasis of the programme was placed on procurement of the equipment and tools required for the urgent repair and replacement of existing power distribution, transmission and generation facilities.



DESA helped repair the spillway gates and inter-gate hoists at Derbandikhan dam in northern Iraq.

As further funding became available, larger, more comprehensive contracts were undertaken in various fields. DESA's responsibilities in northern Iraq spanned the first three, and a portion of the fourth phase of the distribution plan, totaling US$78 million.

DESA is modernising Dokan hydro-power station in northern Iraq

DESA is responsible for observation activities in the fifteen Governorates of southern and central Iraq for plant and equipment procured by the Government of Iraq. UNDESA assists in the implementation of Security Council Resolution 986 (1995), which permits Iraq to rehabilitate the electricity system in the southern and central regions of the country.

The ceiling on oil sales was eased during 1998 and finally lifted in 1999, enabling the programme to move from a focus on food and medicine to repairing essential infrastructure, including the oil industry, thus increasing funds available to the project. Subsequently, there has been a sharp increase in the volume of goods entering the country, which has in turn necessitated increased observation activities. The expected increase of materials to arrive within the next phase is over US$200 million. This will require considerable additional efforts in observation activities to cover 21 power plants and distribution sites.

Two major responsibilities currently remain with DESA in northern Iraq. These are a contract with ABB Switchgear AB of Sweden for the turnkey construction of the North Erbil 132-kV Substation and the integrated equipment supply for the Azmar 132-kV Substation valued at approximately US$ 20 million, and a contract with Technopromexport of Russia for the rehabilitation of the Dokhan Hydropower Station valued at US$ 6 million. Most work related to the overhaul of the generating units has already been completed. ◘

State-of-the-art 132-kV switchgear under installation at Azmar Substation

CSD-9 continued...

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well as maintenance mechanisms, poverty eradication strategies, rural transport and urban transport issues, transport related pollution and means to reduce it, efficient and fair pricing systems, the need to finance commercially non-viable but socially essential large-scale mass transportation systems, and better integration of land-use and transport policies. Many countries noted that transport and mobility played a positive and essential role in society. Improving transport systems to promote sustainable development, including improving accessibility, can foster economic and social development, assist the integration of developing countries into the world economy and contribute to the eradication of poverty.

Members of the Energy and Transport Branch service negotiations at CSD-9

Meeting the transport needs of the poor in both urban and rural areas is vital to the eradication of poverty. It was further noted that globalization requires modern and efficient transport systems and those countries with inadequate systems might be unable to compete effectively in attracting foreign direct investment (FDI) and/or in marketing their products.

With regard to Atmosphere, there was strong agreement that problems related to atmospheric pollution that must be addressed include increasing urbanization and the link between economic growth, energy use and unsustainable patterns of production and consumption. Many delegates highlighted the importance of transferring environmentally sound, and locally adapted, technologies to developing countries as an effective tool for abatement of air pollution and atmospheric emissions. The need for promoting capacity-building, training and public awareness, with more emphasis on adaptive measures, was also noted.

The negotiations were widely viewed as successful and the Commission is preparing to continue the dialogue at the forthcoming World Summit on Sustainable Development to be held in Johannesburg, South Africa in September 2002. ◘

To view decisions in full, visit
<www.un.org/esa/sustdev/csd-9>
To learn more about the Summit, visit
<www.johannesburgsummit.org>

Ad Hoc Inter-Agency Task Force on Energy Meets in Rome

Officials responsible for energy from the various units and bodies of the United Nations met in Rome at the invitation of the Food and Agriculture Organization (FAO) on 26-27 July 2001 to coordinate and cooperate on energy projects and activities in light of recent decisions taken by the Commission on Sustainable Development. Administrators from UNIDO, UNEP, UNDP, UNESCO, UNFPA, UNFPA, WMO, WHO, GEF and the UN regional commissions meet periodically to share information on their activities in order to avoid duplication of effort and ensure that UN work in the area of energy is in line with the goals of sustainable development.

The sixth session of the Ad Hoc Inter-Agency Task Force on Energy was chaired by Ms. JoAnne DiSano, Director, Division for Sustainable Development, UN/DESA. Mr. Deitrich Leihner, Director of the Research, Extension and Training Division of the Sustainable Development Department, FAO welcomed the Task Force noting the positive synergies that arise when mobilizing specialized expertise available in the area of energy across the United Nations system. Participants discussed the outcome of the ninth session of the Commission on Sustainable Development and ways and means to implement decisions taken. Current joint activities include the World Solar Programme (WSP) and the development of energy indicators for sustainable development. A representative of UNESCO updated members on the most recent WSP decisions noting that it is now an instrument at the service of the international community and has been integrated into the mainstream efforts of the UN system. UNESCO's contribution to the WSP will continue to focus on capacity building, education, training and information. Representatives from FAO, UNEP, ESCAP and DESA outlined on-going technical assistance projects with a view to cooperation and coordination among UN entities on specific activities.

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Energy Efficiency through Standards and Labelling

Since 2000, the DESA Energy and Transport Branch has teamed with the Collaborative Labelling and Appliance Standards Program (CLASP) in the implementation of a global project to facilitate the design, implementation, and enforcement of energy efficiency standards and labels for appliances, equipment, and lighting products in developing countries around the world. CLASP is a programme of the Lawrence Berkeley National Laboratory, the Alliance to Save Energy and the International Institute for Energy Conservation. The rationale for the project rests on the fact that energy efficiency standards and labels are an especially cost-effective policy for conserving energy. They support other energy efficiency policies and can play a role as the backbone of a country's energy policy portfolio. Efficiency standards and labels force a shift to energy efficient technologies and dramatically improve national energy efficiency. The project is funded primarily by the United Nations Foundation.

The objective of the project is to promote efficiency standards and labels in countries with developing and transitional economies through partnerships with agencies, stakeholders and relevant institutions in those countries. With support from the UN Foundation, USAID, Energy Foundation, and US Department of Energy, the project has developed globally applicable technical and policy support tools, conducted regional workshops, and continues to provide technical support to partner countries. In each participating country, the project results in enhanced institutional capacity for implementing standards and labelling programmes, increased production of energy-efficient products by manufacturers, improved average energy efficiency of appliances and equipment, significant reductions in electricity consumption, and lower energy-related emissions of greenhouse gases and other pollutants.

The project works at the national level to build the skills and institutional capacity necessary to develop, enforce, and maintain standards and labels. National successes will help build a critical mass of knowledge, skills, and infrastructure in each region. Participation by multiple countries in the same region will begin to have an effect at the regional and international levels through effects on equipment trade flows.

CLASP research has led to the creation of significant informational resources. Chief among these is the "Guidebook for Energy Efficiency Standards and Labelling", which was developed as a tool for policymakers. It is available in print and on the CLASP webpage: <www.CLASPonline.org>. It is also available in Chinese. The project has also organised and implemented two very successful regional workshops: the Latin American Regional Workshop on Energy Efficiency Standards and Labelling held in Mexico City on 10-11 August 2000 and the Regional Symposium on Energy Efficiency Standards and Labelling in Asia held on 29-31 May 2001 in Bangkok. Both examined lessons learned in those regions in: minimum energy performance standards; labelling; performance energy testing; and monitoring, evaluation and enforcement.

At the national level, the project is undertaking projects in a number of countries such as:

Ghana

The primary motivations for the programme in Ghana are to ensure rational energy choices, protect consumers from "dumping" of obsolete products and to stimulate the adoption of energy efficient technologies and practices. CLASP's Ghana programme is a full partnership providing technical assistance, training and information exchange. Technical, educational and financial support from CLASP will provide Ghana with the resources to successfully complete the design and implementation of a comprehensive equipment labeling and standards programme and has the potential to catalyze significant regional benefits in the form of higher-efficiency consumer goods throughout West Africa. In Ghana, the CLASP programme is intended to build capacity within the Government of Ghana and the NGO sector to advocate, promulgate, and enforce energy efficiency standards for appliances and equipment. The CLASP programme is also assisting in the development of an effective labeling tool.

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Korean Energy Efficiency Label

Iranian Energy Efficiency Label

DESA Continues Work in Egypt

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generation and use of fossil fuels for industry with the technical and executive management support of the UN DESA. The total project cost is US$ 5.1 million and it has a 4.5-year implementation schedule.

In responding to operating conditions, public and private industry must invest in process modifications and new machinery to remain competitive, with excellent likelihood that their investments will have favourable rates of return based on savings from reduced operating costs. The funding for this project will leverage the new investments in ways that are most beneficial to the global environment.

The cogeneration plant of Alumisr, an aluminum company in Helwan, Egypt

In the past decades, large consumer subsidies contributed to inefficient usage of energy in Egypt. The consumption of electricity is also inefficient for the same reason (although the generation of electricity is now quite efficient). Government subsidies to the energy sector have created a negative incentive for customers to control consumption or conserve energy. Industry continues to use inefficient processes. Per capita consumption of energy in Egypt is nearly 0.6 TOE/year, and of electricity alone, nearly 800 kWh annually.

The Egyptian power sector has achieved gradual improvements in technical performance during the past 10 to 15 years: thermal efficiency has improved from less than 30% to the current value of 38.9%; system losses have been reduced from 18% to 14%; transmission losses are now below 7%; the network has adequate reserve capacity and the number of unscheduled outages has been dramatically reduced; and almost 25% of total energy production is from seven combined cycle power stations burning natural gas. However, operational efficiency is below potential because of transmission network constraints and dispatching limitations.

Although concerns regarding energy conservation and environmental protection are contained only implicitly in the official plan objectives to improve efficiency, maximize fuel exports, and encourage private sector operation, Egypt has become increasingly interested in energy conservation initiatives. Faced with increasing costs as energy prices are adjusted toward true market value, a growing number of public and private companies that make intensive use of energy resources are actively involved in conservation programmes and have initiated and financed several programmes through internal funds as well as grants. Environmental protection is an increasing concern of the Government, as well, but still in the early development stage.

There are two primary ministries which control ownership and development of the power sector and the oil and gas industry, the Ministry of Electricity and Energy (MOEE) and the Ministry of Petroleum (MOP), respectively. Within the MOEE, there are twelve electricity companies responsible for generation and transmission, the supervising company EEHC, and the New and Renewable Energy Authority (NREA), charged with research and development and commercial application of renewable energy technologies (both electric and thermal).

The OEP, which is fairly independent but administratively tied to the MOP, has been a focal point for non-electrical energy planning and utilization analysis. Most of its work involves studies and analysis.

The long-term policy and overall objectives will be achieved through:

* supporting efficiency improvement and loss reduction in the generation, transmission and distribution of electric power;

* facilitating adoption and implementation of energy conservation measures in residential, commercial, and industrial sectors through education, promotion, financing, and standard-setting activities;

* stimulating and guiding the private sector in the development of a capability for end-use energy efficiency service planning, feasibility analysis, conceptual design, and project implementation, including the manufacture of energy efficient products;

* assisting in the international and regional transfer of experience and technology that could be instrumental in GHG emission reduction; and

* promoting public and private sector

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Focus on China: Commercialising Renewable Energy

Since March 1999, the Energy and Transport Branch has been working with the Chinese State Economic and Trade Commission and the State Environmental Protection Administration (SEPA) to encourage the widespread adoption of renewable energy technologies in China by removing a range of barriers to their increased market penetration. In so doing, the project has created the Chinese Renewable Energy Industries Association (CREIA) as a centre for activities in renewable energy with the ultimate goal of becoming a domestic and commercially oriented and independent NGO that will play an advocacy role for renewable energy development. CREIA has been exceedingly successful in garnering both domestic and international industry support as well as advancing down the path of self-sufficiency.

CREIA was created as the main centre of activity for the UNDP/GEF funded "Capacity Building for the Rapid Commerialisation of Renewable Energy" project aimed at supporting the acceleration of sustainable commercialisation of renewable energy technologies in China through capacity-building activities directed at policy, business, finance, and technical barriers to commercialisation. In the course of project implementation, key principles have included: developing a strong interface with the renewable energy business and finance communities, both domestic and international; maintaining a market-oriented focus; and emphasising commercial feasibility and sustainability. Technology transfer for state-of-the-art commercial technologies is a key focus, as well as incorporation of international experience for business development, financing, project development, and policy initiatives. The project aims to improve commercialisation capacity in five key market sectors:

'CREIA has rapidly become a forum for expressing industry needs to multiple stakeholders in the renewable energy community at large'

i) large-scale wind farm development;

ii) industrial-scale biogas plants for livestock farms, alcohol distilleries, and other similar industrial manufacturing operations;

iii) hybrid systems for village power applications, focusing on villages in western China and on coastal islands;

iv) individual household and large-scale urban solar water heating applications for commercial and residential buildings; and

v) intermediate-scale (15-25 MW) bagasse cogeneration plants.

The project also focuses on policy activities through assistance and information dissemination to national and local government decision-makers and collaboration with other policy-oriented advocacy groups and programmes in China.

CREIA has rapidly succeeded in capturing the attention of the domestic renewable energy industry and has become a forum for expressing industry needs to multiple stakeholders in the renewable community at large. International visibility for CREIA has also been raised to a very high level via numerous visits by international companies, trade groups, and others in Beijing and by aggressive promotion in international forums abroad.

Workshops and Knowledge Sharing

Several domestic and international study tours and workshops were conducted that generated media participation and promoted information dissemination on a scale uncommon in China. In the beginning stages of the project, CREIA undertook study tours to Australia, Japan, the United States and Europe. During the last year, the three following workshops were held and recognized as being the first of their kind to be held in China. All attracted much attention and were deemed quite successful.

'CREIA has made great strides in creating a new wave of knowledge never before seen in China.'

Biogas Commercialisation Strategy Validated in Hangzhou

Over 130 livestock farm representatives, biogas project developers, key decision makers of local and national Government, and international experts attended the first workshop in China that was designed to create a specific forum to promote business development between livestock farm owners and managers, and biogas project developers. The workshop produced several signed contracts and initiated numerous business discussions that are being followed up. The workshop initiated a partnership between SEPA regulatory officials, local government decision makers, and the biogas industry to disseminate technical and financial information for anaerobic biogas digestion systems for wastewater treatment to large and medium-scale livestock farmers in the mid-eastern and southern regions of the country. Enforcement of wastewater discharge standards by national and local regulators, and opportunities for profitable investment projects were presented as two driving forces for biogas technology dissemination. International experts from the Netherlands, Denmark, and the U.K. highlighted differences in European and Chinese approaches and offered recommendations for improving the investment potential for biogas plants.

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Focus on China: Commercialising Renewable Energy

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First Contact with Institutional and Private Investors for Renewable Energy

Over 75 representatives of domestic and international institutional and private investment firms, domestic renewable energy companies, and local government officials attended the first workshop in China to specifically offer a forum for introducing investment institutions to the Chinese renewable energy industry. Prior to this event, most attention in China was focused on engaging the domestic banking industry in renewable energy project financing. The workshop was very productive as an information exchange forum, a clear exposition of the needs and expectations of the investment and renewable industry sectors, and as a development forum for the next steps for increasing business cooperation between both sectors. Challenges identified include the lack of investment-grade feasibility studies and project proposals, uncertainties associated with the business environment in China, lack of an expert pool of professional project developers, and lack of financial and managerial transparency in many renewable energy companies. In addition, strong trends identified included increasing interest among renewable energy companies in being listed on stock exchanges, strong interest from institutional and private investors in making "green" investments in China's renewable energy markets, and a gradual trend toward larger project scale and more sophisticated and standard international financing practices. One important outcome of the workshop was the strong interest from specific NGOs in creating one or more renewable energy investment funds in China.

Village Power Business Development Success in Xining

Over 80 representatives from solar companies, hybrid system integrators, village communities, local and national Government decision-makers, and international business and investment companies attended the first forum in China to assemble end-users and developers of hybrid village power systems for a common discussion. The workshop was successful in meeting its training objectives and in soliciting an exchange of information on experience to date and ideas for future development of community-scale power systems in remote unelectrified villages in western China. As a result of the workshop, the Poverty Alleviation Office in Beijing agreed to support two community power systems in Hebei and is developing six additional projects in Xinjiang with a system integrator in Beijing. Another important outcome of the workshop was a conceptual draft plan for supporting business models for village power commercialization using the vehicle of a multiple-village development project, including enterprise development and local investment mechanisms.

> *'During the past year, the three... [CREIA] workshops were ... recognized as being the first of their kind in China'*

Pilot Project Momentum

During 1999, two biogas technology application projects were completed and three additional projects for biogas and one for a hybrid village power system passed the design certification and equipment specification stage. Currently, civil and equipment construction is in progress for the Beilongdao hybrid village power system. Procurement documents are in final form for submission to the Procurement Division at UNDESA for the Lingshandao and Mazhongshan village power projects. Both the Dengta and Shunyi biogas plants at large-scale pig farms in Hangzhou and Beijing, respectively, are in operation after commissioning. The Jiuchang distillery biogas project in Qingdao is under construction. Pilot projects continue to demonstrate the effectiveness of real demonstration projects in promoting business development and in convincing key decision-makers in Government, commercial enterprises, and investors to promote the wider spread dissemination of these technologies. Bagasse cogeneration activities were initiated with an industry tour and survey of five candidate sugar mills for retrofit heat and power projects during February 2001. Three mills were chosen to initiate feasibility studies and it is anticipated that two of these mills will be selected for project development.

Provision of policy inputs has become one focus of the project. Examples include participation in several events related to establishing a Renewable Energy Portfolio Standards policy initiative for China, incorporation of the policy dimension in technology demonstration activities, and collaborative discussions with groups such as the World Wildlife Fund, the Packard Foundation, and the Asian Development Bank.

Future Plans

During the next twelve months, CREIA and the project in general will be directed toward a wide range of goals. These include:

* Consolidating a leadership position in China as a recognized business development partner with domestic renewable energy industry groups and with international companies and other organizations looking for windows of opportunity in China;
* Making efforts to strengthen its consulting capacity to provide enhanced services to its customers;
* Accelerating and expanding commer-

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cialisation support activities;
* Consolidating policy recommendations into a white paper to be distributed among the various levels of Government;
* Expanding and improving work in standards testing for renewable energy products;
* Pursuing engagement of the financial, investor, and banking sectors in China in support of development of renewable energy funds for equity investments and for feasibility studies and project development; and
* Using training activities to support the emergence of a project development base in China.

The project is funded by the United Nations Development Programme, the Global Environmental Facility, the Government of Australia, the Government of the Netherlands, and the Government of the People's Republic of China. Yet, during the past six months CREIA was also awarded and is now implementing several contracts with Government agencies and foundations as part of its self-support strategy. Over the next twelve months, CREIA is preparing and refining business development plans to increase its capacity for self-support. To help further strengthen its service capacity, CREIA also launched its web-site at <http://www.creia.net>, which incorporates the online Investment Opportunity Facility and a number of information databases. ◘

Visit <www.creia.net>

Dengta: Pig Farm Waste as an Energy Source

As part of the "Capacity Building for the Rapid Commercialization of Renewable Energy in China" programme, UNDESA, UNDP and GEF are supporting a pilot project to collect and reuse biogas from pig farms, thereby simultaneously reducing greenhouse gas emissions and promoting renewable energy production and use.

With an annual production of 200,000 pigs, the Hangzhou Dengta Yangzhichang livestock farm in Zhejiang Province is the largest pig farm in China and one of the largest swine production operations in the world. The Farm had a significant pollution problem, emitting 3000 tonnes of wastewater effluent per day causing pollution that equaled the burden of a county-scale wastewater treatment plant. A biogas plant was created by the Project to assist in the reduction of this waste.

The Dengta biogas plant employs the most advanced commercial technology available in a combined anaerobic/aerobic treatment facility, utilizing UASB (upflow anaerobic sludge blanket) and SBR (sequencing batch reactor aerobic) technologies. The plant also employs cost effective and efficient construction technology from LIPP GmbH in Germany and a highly automated control system for plant operation and management. The plant treats 185 tonnes of solid manure and 3,000 tonnes of wastewater per day to generate up to 8,500 cubic metres of biogas and 140 tonnes of solid organic fertilizer per day. Wastewater discharged by the plant meets the primary National Wastewater Effluent Discharge Standards for COD, BOD, and nitrogen content enforced by the Chinese State Environmental Protection Administration.

'The total reduction of methane is about 2 million cubic metres, which equals about 66,000 tonnes of CO_2 per annum'

The total reduction of methane emissions to the atmosphere is about 2 million cubic metres, which equals about 66,000 tonnes of CO_2 per annum. Biogas produced at the plant is currently used as boiler fuel for plant operations and for a nearby village town gas supply (1,000 cubic metres per day). Biogas produced at the farm has the potential to generate 13,500 kWh of electricity per day and a total of 4.93 million kWh per year. The first of two 200-kW biogas generators was recently installed and current electricity production is being used internally. Power will eventually be sold to the local grid upon negotiation of a power purchase agreement (PPA).

The Dengta biogas project has had a major impact on the promotion and dissemination of environmental technologies at livestock farms throughout China. The engineering firm that constructed the turnkey facility in 1999 and 2000, the Hangzhou Energy and Environment Engineering Design Institute, has been contracted for several biogas plant feasibility studies and construction projects for major livestock farms in central and southern China, as a result of visits to the pilot plant. In nearby Xiaoshan City, the municipal government has mandated biogas plant construction at the 18 largest pig farms in its jurisdiction, based on the demonstration of effective technology at Dengta to handle wastewater treatment. The Hangzhou Municipal Government has also required biogas plant development at the five largest farms in its territory, with production in the range of 2,000 to 100,000 pigs per year after observing the success of the Dengta plant. ◘

Quantity-Based, Market-Oriented Pollution Control in China?

By Roger K. Raufer

Most western economies began their pollution control efforts within a "command and control" regulatory framework, and have subsequently modified this to include economic mechanisms. The United States, for example, developed a quantity-based economic programme in the 1970s known as "emissions trading," and this approach has now been applied to a host of environmental problems including acid rain, tropospheric ozone in cities, and lead in gasoline. Most recently, such an approach was included in the Kyoto Protocol for greenhouse gas (GHG) controls. Other countries, particularly those in Europe, have employed price-based economic instruments (such as pollution taxes) instead of quantity-based ones. China, too, modified its initial command/control approach in the late 1970s, adopting a pollution levy system designed to target those emission sources not in compliance with regulations, and collecting a fee based on each kilogram of pollution above the level targeted by command/control. While not a full-fledged Pigouvian pollution tax (since it applied only to excess emissions), it nonetheless falls comfortably with the priced-based economic approach.

Recently, however, a number of countries in Europe have been moving towards the quantity-based approach. Both Denmark and the U.K. have introduced emissions trading schemes, and the European Union has proposed such a programme that would begin in 2005 to address GHGs.

Could China move in such a direction as well? There are several hints indicating that it might.

Most important, of course, is the current quantity-based approach of the Kyoto Protocol, and the role that China will play in the market for carbon credits. According to some studies, China is poised to capture fully 60% of the Certified Emission Reductions (CERs) that would be developed under the Clean Development Mechanism (CDM) of the Kyoto Protocol. The exact nature of the CDM marketplace is currently the subject of much discussion. In the short term, many believe that CERs will be "crowded out" by the relatively cheap Emission Reduction Units (ERUs) available from Russia and Ukraine, now that demand from the U.S. is no longer included. There may be some demand from voluntary U.S. programmes—for example, the Chicago Climate Exchange is currently purchasing emission credits from Brazil—but the events of 11 September and the economic downturn have made strong U.S. participation in carbon markets unlikely in the immediate future.

> *"with the development and perfection of a market-oriented economy in China, it is worth exploring how operational market mechanisms might utilize the power of markets in controlling pollution..."*

Over the longer term, however, the problem of global warming will not go away, and the world will be looking for ways to involve China, India and Brazil in its control programme. CDM represents an initial, voluntary means of doing so, and China's environmental position could be positively affected by these developments.

Another source of international interest in quantity-based systems is evident at the corporate level. A number of large multinational energy firms such as BP and Royal Dutch Shell have already begun to implement their own internal emissions trading programmes (amongst their own business units), and others have indicated corporate support for such approaches. Both companies operate in more than 100 countries, and have diverse business units that are heavily involved in energy production, exploration and utilization. Shell, for example, has corporate GHG emissions that are comparable to those of the entire country of Belgium. Shell has instituted the STEPS programme (*S*hell's *T*radeable *E*missions *P*ermit *S*ystem), which seeks to reduce GHG emissions by more than 10% over 1990 levels by 2002. BP's programme is even more ambitious, targeting a similar reduction through 2010. To the extent that China integrates into the world economy through the World Trade Organization, and seeks to continue its development along market-oriented lines, the environmental actions of such private-sector entities within its own national borders will similarly exert influence towards quantity-based systems.

At the national level, there have been a number of projects designed to explore and examine the potential role of emissions trading and other comparable quantity-based approaches. The Asian Development Bank supported an initial exploratory project using this approach, including analyses in Shaanxi Province and other locations. It is currently funding an evaluation of emissions trading to address acid rain concerns in Shanxi and Anhui Provinces. Other organizations have identified at least nine case studies where the emissions trading approach has been applied, in as many provinces.

In addition to such efforts at the provincial level, the Chinese Government has similarly indicated an interest in applying such quantity-based mechanisms at the national level to address the problem of acid rain. In late 1999, the State Environmental Protection Administration conducted a workshop in

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William Wallace Receives Chinese Friendship Award for 2001

Dr. William Wallace, Senior Technical Advisor to the UNDP/GEF "Capacity Building for the Rapid Commercialisation of Renewable Energy in China" project executed by DESA was awarded the National Friendship Award this year for outstanding contributions to the long-term development of renewable energy in China.

Each year the Chinese Government, under the supervision of the State Administration of Foreign Experts Affairs, recognizes 50 individuals for outstanding contribution and service in the cause of technical and social development in China. The Friendship Award is the highest-level state award that can be given to foreign experts in China, and 2001 represents the twelfth year that award presentations have been made. Chinese Premier Zhu Rongji met the awardees during a ceremony in the Great Hall of the People on the evening of 30 September.

Dr. Wallace receives the Friendship Award

Dr. Wallace has been living in Beijing and working with the Commercialisation of Renewable Energy project since August of 1999. The project is co-financed by the Government of the Netherlands and the Aus-Aid Programme of Australia and is aimed at accelerating sustainable development through the commercialization of environmentally friendly renewable energy technologies in Chinese markets. Dr. Wallace has been assisting the Chinese Government and the domestic business community in developing projects related to wind farms, rural electrification, solar water heating technologies and markets, bagasse cogeneration in the sugar industry, and industrial-scale biogas applications.

The project is now in its third year and can be credited with several successes including eight pilot projects for commercialization of biogas plants at large-scale livestock farms and industrial plants, hybrid village power systems in the coastal island and western regions of China, and cogeneration plants in sugar processing mills. ◘

Pollution Control in China continued...

(Continued from page 10)

conjunction with the U.S. Environmental Protection Agency to explore the feasibility of using such market approaches for sulfur dioxide emissions in the country. The workshop programme suggested that "with the development and perfection of a market-oriented economy in China, it is worth exploring how operational market mechanisms might utilize the power of markets in controlling SO_2 pollution ands improving environmental quality." At the conclusion of the workshop, the two national regulatory agencies agreed to work collaboratively on a feasibility study addressing such an approach.

One of the points raised at the workshop was the fact that China has already taken a preliminary step towards the quantity-based approach by implementing a Total Emissions Control (TEC) programme [sometimes also referred to as the Total Amount Control (TAC) or the Total Quantity Control (TQC) approach]. This shift in environmental policy came about in the mid-1990s when the Chinese Government realized that individual facilities could meet concentration limits on emissions, yet the sum total of pollution could still result in significant environmental degradation. This was similar to the American experience, where power facilities were able to meet emissions requirements, and achieve localized ambient air quality standards—yet the total loading of emissions still resulted in considerable acid rain damage. In China, it was also designed to fix emissions limits at levels based on the historical levels of previous years.

The political and distributional characteristics of such quantity-based systems have been an important factor in their implementation. By granting a (limited) "right to emit" that has economic value, quantity-based systems have been able to reduce the political resistance of polluting entities towards pollution control regulation. By using resources wisely and lowering costs, economic mechanisms like emissions trading can allow governments to be more aggressive in tackling environmental problems, and setting more stringent environmental goals.

Whether such quantity-based approaches will become feasible in China remains to be seen. But given the country's recent accession to the WTO and its on-going development towards a market-oriented economy, a comparable transition in the environmental sphere can be anticipated. ◘

Roger Raufer is a new and welcome addition to the Energy and Transport Branch. See page 15 to learn more about his expertise and experience.

New Delhi Roundtable to Discuss Sustainable Energy Consumption and Production Patterns

A Multi-Stakeholder Roundtable on Energy for Sustainable Development will be held in New Delhi, India, from 21-23 January 2002. The meeting is sponsored by DESA and organized by the Tata Energy Research Institute (TERI) in cooperation with UN Economic and Social Commission for Asia and the Pacific (ESCAP). The objective of the meeting is to evolve concrete ideas for new partnerships among relevant stakeholders, as well as proposals on concrete mechanisms designed to bring about a movement away from current unsustainable patterns of production and consumption of energy to more sustainable patterns, as called for in a resolution of the nineteenth Special Session of the General Assembly. The meeting is expected to build on the recommendations of the ninth session of the UN Commission on Sustainable Development as well as on the results of the World Energy Assessment (WEA), a joint endeavour of UN DESA, UNDP and the World Energy Council. The New Delhi Roundtable will also promote outreach for WEA, a process in which DESA has been engaged with support from the United Nations Foundation.

Participants will include representatives of Governments from different regions, business and industry, as well as civil society. The majority of representatives will be from the ESCAP region, though a few participants will represent Member States from the ECLAC, ECA, and ESCWA regionals.

The UN interagency Inter-agency Task Force on Energy has fully backed this effort and indeed the meeting itself represents a joint initiative to adopt a coordinated approach to address energy for sustainable development. Representatives of from UNDP, UNEP, UNIDO and other many UN agencies are expected to participate. The GEF has

(Continued on page 14)

Inter Agency Task Force on Energy continued...

(Continued from page 4)

The following areas of work were identified as having particular relevance to ongoing and planned work within the UN system:

* Maximizing existing and exploring ways to increase financial resources and creating innovative financing mechanisms, including the outcome of COP6*bis*, and the Clean Development Mechanism;
* Continuing a dialogue on issues for WSSD;
* Public-private partnership programmes to promote energy efficiency, advanced fossil fuel and renewable energy technologies;
* Networking between centres of excellence for capacity building, technology transfer and information clearing-houses;
* Grants and loans for development of energy infrastructure including for rural and remote areas;
* Financing and risk management;
* Equal access for women; and
* Regional cooperation to: strengthen national and regional energy institutions or arrangements, conduct in-depth studies, promote training and exchange of experience, strengthen regional networks of excellence, strengthen and establish regional information and dissemination capabilities; promote rural electrification and integrate energy policies into overall rural development strategies at the regional level, strengthen regional cross-border energy trade, and strengthen and facilitate dialogue forums among producers and consumers of energy.

The Task Force was briefed by DESA on the preparations for the forthcoming World Summit on Sustainable Development to be held in Johannesburg, September 2001, including the planned preparatory committee meetings to be held in January/February, March/April and May/June of next year. The Task Force was also briefed on the recently held Regional Roundtables of Eminent Persons sponsored by DESA and it was noted that in most regions the area of energy (along with freshwater) was singled out as a particularly important sector, even though a sectoral approach was not generally followed at the roundtables. Energy may be identified as an important issue for consideration at WSSD by the subregions and regions in their intergovernmental preparation processes. It was agreed that a balanced approach with emphasis on the three pillars of sustainable development (economic, social and environment) remains important and it was noted that UNEP and the regional commissions are committed to this approach.

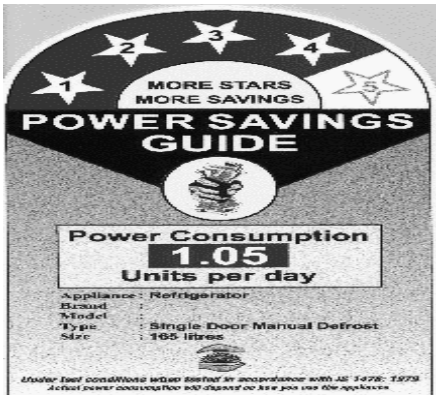
Participants noted that in following up on decisions of CSD-9 and in preparations for WSSD in the area of energy the full participation of all stakeholders remains vitally important. It was decided to include all stakeholders and interested parties in a Roundtable on Energy for Sustainable Development to be held in New Delhi to discuss the creation of new partnerships for concrete actions. The Roundtable will be organized by DESA in cooperation with the Tata Energy Research Institute (TERI) and UN ESCAP. ◘

Standards and Labels continued...

(Continued from page 5)

Poland
The primary goal of CLASP's Poland programme is to work with Polish counterparts to fill the gap between the comparative labeling policy directive and its effective implementation. As Poland also has some experience with voluntary labeling schemes, CLASP will help coordinate the integration of standards and labeling programmes. In consultation and cooperation with CLASP, the lead Polish partner, Krajowa Agencja Poszanowania Energii (KAPE or the National Energy Conservation Agency) will prepare and disseminate a comprehensive status report on standards and labels in Poland. This will form the basis for discussions with stakeholders, including appliance manufacturers and distributors, consumer groups, relevant media groups, and governmental and NGO energy efficiency advocates.

China
The CLASP programme in China has focused on the key areas of capacity building and technology transfer through an applied programme of standards and labeling development. The programme combines extensive cooperative technical assistance with outreach and training developed around priorities set by the Chinese Government. The programme is directed along three lines of action:
* Introduction of advanced techniques for the analysis of product energy performance in order to standardize and optimize new product energy standards;



Indian Energy Efficiency Label

* Transferring the expertise, analytical techniques and lessons from international experience to the development of energy efficiency criteria for the energy efficiency label, and for the development of a new mandatory information label; and
*Assisting China to strengthen its energy testing-laboratory management and procedures to reduce allowable testing tolerances, increase accuracy and comparability, and improve supervision.

The CLASP programme has been able to make great strides down the road toward improved energy efficiency in the last three years and hopes to continue to build on this success as the program grows to include more countries and greater regional integration. ◘

To learn more about CLASP and Standards and Labels, visit **<www.clasponline.net>**

GITE continued...

(Continued from page 2)
port emissions standards, and indicators.

The Partnership for Vehicle and Fuel Technology Modernization (PVFTM) is a consortium of Strategic Business Partners composed of participating multinational automobile manufacturers and petroleum companies willing to enter into technology-sharing arrangements with developing country industries. The PVFTM will identify technology needs and match them with available solutions through a series of background reports, an interactive web page, and roundtables of vehicle manufacturers, fuel companies, policy makers, and transport experts. The PVFTM has already been successful in attracting several major industrial partners from the private sector.

Finally, the Small Initiatives Clearinghouse will identify and define small transport emissions reduction projects to be implemented by private sector interests or by national governments. The SIC will work with sponsors to develop a project to the concept stage and prepare it for presentation to potential funding agencies, as well as assist in identifying sustainable financing mechanisms. The SIC is currently working with several major projects in Brazil.

As part of the contribution to CSD-9, the ETB drafted a background paper on Transport that considers the role of transport in economic and social development, as well as its environmental dimension with a view toward policy recommendations. The paper presents an analysis of various transport technologies currently in use in industrialised and developing countries, as well as advanced technologies with potential for contributing to sustainable development.

The GITE will be active in the preparations for the World Summit on Sustainable Development as well as various other activities this year. ◘

Visit <www.un.org/gite>

Egypt continued...

(Continued from page 6)
investments in energy projects that are beneficial for the global environment.

Emphasis of the project is placed on building capabilities within the EEHC and the electricity companies (ECs), stimulating a private market in energy efficiency services, and providing a mandate to OEP to work with the Ministry of Housing (and its Building Research Centre) and the Ministry of Industry to develop codes and standards that will improve the efficiency of energy utilization in new buildings and new equipment. Specific needs and their expected treatment include the following.

1. Improvements to the EEHC transmission system and introduction of load management in network loss reduction and load management will bring greater efficiency to the power system.

2. Project emphasis on energy efficiency is being coordinated with internal initiatives at the EEHC to address customer services and, among the ECs, to address the need for new services and revenue enhancements with customers, and with external donor efforts to achieve overall progress with energy and environmental policies in Egypt.

3. The power system will have the greatest potential for efficiency when the EEHC and ECs cooperate on load management, utilization efficiency, and local cogeneration opportunities.

4. There is a need for a government sector initiative to stimulate a market demand for energy efficiency services, and this will be addressed by the project.

5. Promoting energy efficiency services will offer support to attract local and foreign engineering organizations and technical service businesses to delivery energy services in Egypt.

6. New solutions to financing mechanisms for energy efficiency will be pursued through one of the project components.

7. The development of energy efficiency standards and codes for new equipment and new buildings will address not only technical standards, but also local manufacturing and construction capabilities, and enforcement mechanisms.

It is important to state that the UNDP/GEF project on its own cannot solve the GOE's need to define a more effective institutional framework for energy efficiency and environmental protection. Yet it is certainly hoped that the experience in designing, managing, and coordinating the project activities can contribute to a clearer sense of how the country's organizations can develop a clear energy strategy and action plans.

There is a clear opportunity to reduce per capita consumption of energy resources, and in the process, achieve benefits to the global environment through improved utilization (or end-use) efficiency, reducing losses, developing renewable resources, and applying more modern techniques of cogeneration, all of which imply a beneficial reduction in the emission of GHGs. In particular, there is abundant biomass from agricultural waste which is largely unexploited, yet which represents an additional fuel resource with direct benefit to GHG reduction to the extent that it replaces fossil resources.

It is clear that substantial interest and basic capabilities exist in Egypt and that there has been sufficient evidence that efficiency can be accomplished in all energy-using sectors. The greatest need to approach the opportunities for efficiency in energy use are for a combination of leadership, development of more in-depth knowledge of technical solutions, and mobilization of public and private organizations to promote and invest in energy efficiency. It is timely to proceed, to build on accomplishments of previous donor and in-country programmes, and to work toward improvements in energy efficiency and reduction of GHG emissions. It is expected that this progress can be accomplished through GOE programmes and private sector initiatives supported by the UNDP/GEF project and with continued assistance from other donors. ◘

New Delhi Roundtable Continued...

(Continued from page 12)
agreed to provide support to facilitate the participation of a few experts from developing countries.

The meeting is expected to focus on the following themes: access to energy, energy equity, poverty alleviation, integration of socio-economic and environmental dimensions, and mobilization of financial resources for sustainable development. A roundtable format has been adopted for the meeting to allow for maximum interaction and discussion among the various stakeholders to facilitate the formulation of concrete proposals containing mechanisms needed for implementing agreed recommendations.

The outcome of this meeting could serve as a key input into the World Summit on Sustainable Development to be held in Johannesburg next year. ◘

Energy and Transport Branch Welcomes Roger Raufer

Roger Raufer, who joined the Energy and Transport Branch in February, is an environmental engineer with more than twenty-five years of experience in environmental management. Since 1990, he has served as a consultant to DESA addressing air pollution control in China. He has also been a consultant to the World Bank and U.S. AID in numerous countries around the world.

Much of his work has been associated with the environmental impacts of energy projects. He has obtained a variety of environmental permits for utilities and private sector firms, for combustion turbine units, municipal district heating systems, standard industrial and utility boilers, and various waste combustion projects. He also directed more than three dozen atmospheric dispersion modeling analyses, and has served as a consultant to the Environmental Protection Agency, the Department of Energy, and the National Commission on Air Quality in the U.S.

He holds a Ph.D. in Energy Management and Policy from the University of Pennsylvania, and is an adjunct faculty member at Penn. He also holds a B.S. degree in chemical engineering (Ohio University), an M.S. degree in environmental engineering (University of Cincinnati), and an M.A. degree in political science (University of Illinois, Chicago). He is a registered Professional Engineer in a number of U.S. states.

Dr. Raufer authored the book *Acid Rain and Emissions Trading: Implementing a Market Approach to Pollution Control* in 1987, which helped develop the market-based acid rain control programme adopted in the United States in 1990. He also authored *Pollution Markets in a Green Country Town: Urban Environmental Management in Transition*, which was published by Praeger in 1998.

At DESA, he is continuing his work in China, as well expanding the Energy and Transport Branch's market-based environmental efforts in the area of climate change. On a recent visit to China, he helped establish the China End-Use Energy Efficiency Programme, a multi-year UNDP/GEF funded programme that will address energy efficiency in that country's industrial, transport and buildings sectors. He has also been working on a proposed concession mechanism to encourage the development of wind power generation, and finalizing reports on air pollution control in five Chinese cities.

Other recent tasks included providing instruction on market-based environmental mechanisms in the "Women of Africa in Energy Policy and Planning" workshop and travel to Brazil to work on capacity development. ◘

New Cities continued...

(Continued from page 2)

to use public transport or non-motorized transport to travel throughout the day. Although the day was initially met with widespread resistance, it was ultimately so successful that a referendum to have a CFD every year was passed, and the City of Bogotá was awarded the Stockholm Challenge Award for an innovative project that benefits people, society and the environment. The Bogotá example is one that could prove quite useful in convincing other municipalities to consider holding their own CFD as a public awareness and education tool.

In an effort to promote greater sustainability in the transport sector, the GITE group will sponsor a series of Car Free Days as a prelude to the World Summit on Sustainable Development. The GITE team hopes to work with one city in each region to organize and implement a CFD. The first of the series will be held in Bogotá, 6-8 February 2002. Mayors of the capital cities of the Latin American and Caribbean region have been invited for a special tour of the Car Free City. A training seminar will be held in conjunction with the visit to explore obstacles to implementing widespread public transportation systems, potential solutions to the problem of excessive private vehicle use, and using Car Free Days as an educational tool. An extensive public awareness campaign will be held as a prelude to the CFD as an educational tool to promote public transport and sustainable transport policy.

The GITE team will be working with a number of partners to implement this project including City Governments, EcoPlan, the Institute for Transportation and Development Policy (ITDP), the International Council for Local Environmental Initiatives (ICLEI), the United States Environmental Protection Agency, and various foundations and private sector partners. It is hoped that the series will prove a valuable input into the WSSD. ◘

Diversions...

CSD Acrostic by Robin Segal

Acrostic Instructions: Guess the words defined below and write them in their numbered spaces. Then transfer each letter to the correspondingly numbered square in the boxes. Black squares indicate spaces and words can wrap around lines. The filled boxes will contain a quotation. The first letter of each of the words (A. to S.) spell the name of the author of the quotation.

	1-I	2-D	3-D	4-O	5-Q	6-A	7-K	8-P	9-C		10-S	11-F	12-E		13-G	14-Q	15-G
16-K	17-E		18-N	19-R	20-A	21-F	22-A	23-P		24-S	25-S	26-O		27-S	28-L		29-K
30-L	31-N		32-P	33-R	34-D	35-G	36-Q	37-Q		38-M	39-N		40-R	41-G	42-R	43-S	44-K
45-G	46-M	47-N		48-H	49-P	50-O		51-K	52-N	53-D	54-A	55-D	56-M	57-J	58-B	59-D	60-Q
61-L		62-D	63-I	64-O	65-D	66-R	67-N	68-B	69-K	70-H	71-A	72-I		73-C	74-K	75-D	76-B
	77-Q	78-K	79-K		80-D	81-S	82-D	83-E	84-J	85-C	86-L	87-G		88-H	89-P		90-D
	91-B	92-O	93-F	94-Q	95-N	96-P	97-N		98-C	99-N	100-I		101-B	102-L	103-K	104-S	105-D
106-A	107-J	108-D	109-R	110-F		111-Q	112-S	113-H	114-G		115-F	116-E		117-A	118-R	119-D	120-D
121-H	122-S	123-J		124-A	125-G	126-A	127-I		128-G	129-D	130-D	131-J	132-H	133-C			

A. Rabbit nose activity
126 124 20 54 106 117 6 71 22

B. Joyful, cheerful, satisfied
91 58 68 101 76

C. Fill with pride and joy
9 85 98 73 133

D. Member of OPEC
105 34 3 82 80 62 129 2 90 59
65 120 108 119 55 130 75 53

E. Seven plus two
17 83 116 12

F. Ridiculous, farcical, hollow
115 11 93 21 110

G. Norwegian City
35 45 41 128 87 13 114 125 15

H. Attempt, perserverance
70 113 48 121 132 88

I. Measure from sea bottom to sea level
100 63 1 72 127

J. Full of cashews
57 131 84 107 123

K. Sky, unit of air pressure
16 29 69 103 51 7 74 44 78 79

L. Seven minus four
28 30 102 86 61

M. Charged particle
56 38 46

N. Usually occupied
67 39 95 31 99 18 52 47 97

O At no time
4 92 64 26 50

P. Place of learning
23 32 96 49 89 8

Q. Phone technology
5 37 111 94 14 60 77 36

R. Surrounded safe haven
33 42 40 66 118 109 19

S. Rigorous, harsh, cruel
104 25 27 43 10 81 112 24 122

Mission Musings

The return trip to Khartoum, Sudan, on the afternoon and evening of 12 November was punctuated with a solemn and inspiring event which occurred when the two UNDP vehicles returning independently from El Obeid met unexpectedly at the same nondescript rest-spot for prayers at dusk along the east bank of the river. The event inspired these thoughts:

The faithful faced the sacred orientation,
prayers occupying their full concentration,
unaware of the celestial demonstration
gradually unfolding behind their prostration.

For as they arose and turned toward the Nile,
in the darkened sky formed a heavenly smile,
revealed by the sun setting all the while,
was an alabaster cup most fragile.

Among the spectrum of enchanting hues of twilight,
over the thread of the river of grand and might,
hovered the thinnest crescent moon glowing ever bright
rendering a solemn and inspiring sight.

Could it have been a message about the success of the mission
or was it an omen of hallowed religious position?
For so ethereal was the sight to behold,
That its meaning shall forever remain untold.

- Walter Shearer

Acrostic Answers:
a. twitching
b. happy
c. elate
d. united arab
e. nine
f. inane
g. trondheim
h. effort
i. depth
j. nutty
k.atmosphere
l. three
m. ion
n. often busy
o. never
p. school
q. cellular
r. enclave
s. draconian

the author of the work is: "The United Nations CED" [UNCED]

the quote is Principle One of the Rio Declaration:
" Principle 1 Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature."