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A publication of the Energy and Transport Branch of the Division for Sustainable Development  
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# Energy and Transport Newsletter

## The World Summit on Sustainable Development, Johannesburg 2002

The Johannesburg Plan of Implementation agreed upon at the World Summit on Sustainable Development (WSSD) held in South Africa, 26 August–4 September 2002, includes a number of important commitments in the area of energy. Energy is included under two chapters of the Plan: Poverty Eradication, for which access to energy is stressed, and Changing Unsustainable Patterns of Consumption and Production. The following provides some details on the agreement in the area of energy.

*Access to energy:* Governments agreed on the necessity of improving access to energy services in order to ensure the achievement of the Millennium Development Goals, including the goal of halving the proportion of people in poverty by 2015. This is to be accomplished by improving access to modern biomass technologies and fuel-wood sources, supporting the transition to the cleaner use of liquid and gaseous fossil fuels, developing national energy policies and regulatory frameworks, creating enabling environments, addressing capacity-building needs and facilitating access to energy services by the poor through financial and technical assistance and public-private partnerships.

*Renewable energy:* Governments agreed on the need to diversify the energy supply and, with a sense of urgency, to

substantially increase the global share of renewable energy sources with the objective of increasing their contribution to the total energy supply, while recognizing the role of national and voluntary regional targets.

*Energy efficiency:* It was agreed to support efforts to reduce the flaring and venting of natural gas associated with

***Governments agreed on the need to diversify the energy supply and, with a sense of urgency, to substantially increase the global share of renewable energy sources...***

crude oil production. It was also agreed to establish domestic programmes for energy efficiency with the support of the international community, and to accelerate the dissemination and development of energy efficiency and energy conservation technologies, including the promotion of research and development.

*Energy subsidies:* Governments agreed to reduce market distortions, including through the restructuring of taxation and the phasing out of harmful subsidies, and

*(Continued on page 10)*

### Inside this issue:

Looking Forward to UN Car Free Days in 2003	2
Designing Energy Profiles in Developing Countries	2
Partnership for Clean Fuels and Vehicles	3
COP-8 and Sustainable Development	5
Market-based Approaches to Energy Efficiency of Boilers	6
Energy Efficient Refrigerators in China	7
Wind Power in China	8
The Beijing Assembly and the new GEF	10
Diversions	12

# Mobilizing more UN Car Free Days

Last year, the United Nations Department of Economic and Social Affairs (DESA) inaugurated its first series of UN Car Free Days as a ground-level preparation for the World Summit on Sustainable Development to raise awareness and increase public dialogue concerning sustainable transport issues. In cooperation with governments, municipalities, and numerous non-governmental, private and volunteer organizations, both the Colombia Car Free Day and seminar and the Fremantle, Western Australia Car Free Day and seminar were hailed as major successes.

On 7 February 2002, Bogotá held its now annual fully enforced city-wide Car Free Day. With the support of the DESA and the Colombian Ministry of Environment, four other cities joined Bogotá for the first ever Colombia Car

Free Day. Mayors and city officials from every Latin American capital city came to Bogotá to attend the UN Car Free Day seminar and experience the day first hand. Many of the participating cities have pledged to

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*A poll taken by the Ministry of Environment of Colombia showed that 74% of people in Ibaque, Colombia wanted to have more Car Free Days.*

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hold their own Car Free Days this year. Guatemala City held its first Car Free Day on 4 July 2002, a second larger event in November of 2002 and sistered with Bogotá for a full-scale Car Free Day on 6 February 2003.

On Thursday 9 May 2002, the City of Fremantle, Western Australia, held its now annual Car Free Day and

organized a seminar to showcase the event with the support of DESA. The seminar, attended by mayors and city officials from around Australia and New Zealand, was widely praised. Fremantle is currently being considered for the Premier's Award for Environmental Initiatives. Eight other Australian cities have expressed interest in holding a Car Free Day in 2003 as well as the city of Christchurch, New Zealand.

In order to further support this growing movement, the UN DESA Division for Sustainable Development will be starting the UN Car Free Day Collaborative. The Collaborative will bring together partners from governments, the private sector and NGOs to support cities in their Car Free Day initiatives. The Collaborative will further serve as a forum for information exchange and knowledge sharing. ■

## Designing Energy Profiles in Developing Countries

DESA recently joined with the International Atomic Energy Agency (IAEA) and the UN Economic Commission for Latin America and the Caribbean (ECLAC) in an effort that utilizes sustainable energy indicators developed for the ninth session of the Commission on Sustainable Development at the country level in a World Summit on Sustainable Development (WSSD) partnership on designing energy profiles. This project aims to fill the need for more comprehensive energy policies at the national level for the advancement of sustainable development goals, in accordance with the outcome of the WSSD. It also involves outreach programmes aimed both at the general public and at policy makers, so that energy policies for sustainable development are well understood and the public's commitment to such policies is encouraged.

The sustainable energy indicator methodology is currently being applied in Brazil and an international expert

advisory board meeting was convened in December 2002 to review progress made and provide guidance for future activities. Representatives from Brazilian research organizations and Government ministries, including the Federal Ministries of Mines and Energy and of Science and Technology, the Ministry of Environment of the State of São Paulo, the Centre for Biomass (CENBIO), the Graduate School of Engineering (COPPE), and the Federal University of Rio de Janeiro, participated, as well as from the World Energy Council Brazil, Petrobras, OLADE (the Latin American Energy Organization), IAEA and DESA. Professor José Goldemberg, who is actively involved in the project in Brazil, chaired the meeting. He noted that the application of sustainable development indicators will result in an assessment of Brazil's energy situation and policies, as a national level follow-up to the World Energy Assessment.

Brazil is the fifth most populous country, the third largest energy

consumer in the Western Hemisphere (behind the United States and Canada), and the largest emitter of carbon dioxide emissions in the region. However, Brazil enjoys a broad mix of energy resource endowments and technologies, and valuable environmental assets. A major priority for Brazil is to satisfy growing energy demand fuelled by both population and economic growth, and to balance this effort with environmental priorities and other issues such as energy affordability, accessibility, security and efficiency. Energy policies now being implemented and the formulation of future policies are to be evaluated in light of sustainable development needs, and their potential effectiveness in ensuring efficient expansion of energy services.

Bolivia and South Africa have recently expressed strong interest in the project and are expected to join the effort in 2003. Other countries considering participation include China and India. ■

# Partnership for Clean Fuels and Vehicles

One of the most significant outcomes of the World Summit on Sustainable Development (WSSD) was the launching of over two hundred new Partnerships developed among Governments and stakeholders to ensure implementation of Agenda 21 and the WSSD Plan of Implementation. One such partnership is the Partners for Clean Fuels and Vehicles launched by the United Nations Department of Economic and Social Affairs (DESA), the International Fuel Quality Centre (IFQC), the United Nations Environment Programme (UNEP) and the US Environmental Protection Agency (EPA).

The Partnership seeks to work with developing countries to phase out the use of lead and reduce sulphur in fuels as well as to work toward improving fuel quality in general. Activities are aimed at building capacities, improving availability and accessibility of technical information, setting up a network of experts from auto, oil and technology industries to advise on

refinery reformulation, technical progress in the vehicle and fuel sectors, costs and means of financing as well promoting the raising of vehicular standards, and encouraging more effective inspection and maintenance programmes. The Partnership was launched at two side events hosted by DESA and the US EPA in the Sandton Convention Centre and Ubuntu Village, respectively. Thus far, over forty Governments, non-governmental organisations, private sector companies and industry groups have joined the Partnership.

The Partnership will work to:

- Help developing countries to draw up action plans to complete the global elimination of leaded gasoline and start to phase out sulphur in diesel and gasoline fuels, concurrent with adopting cleaner vehicle requirements;
- Support the development and adoption of cleaner fuel standards and cleaner vehicle requirements by

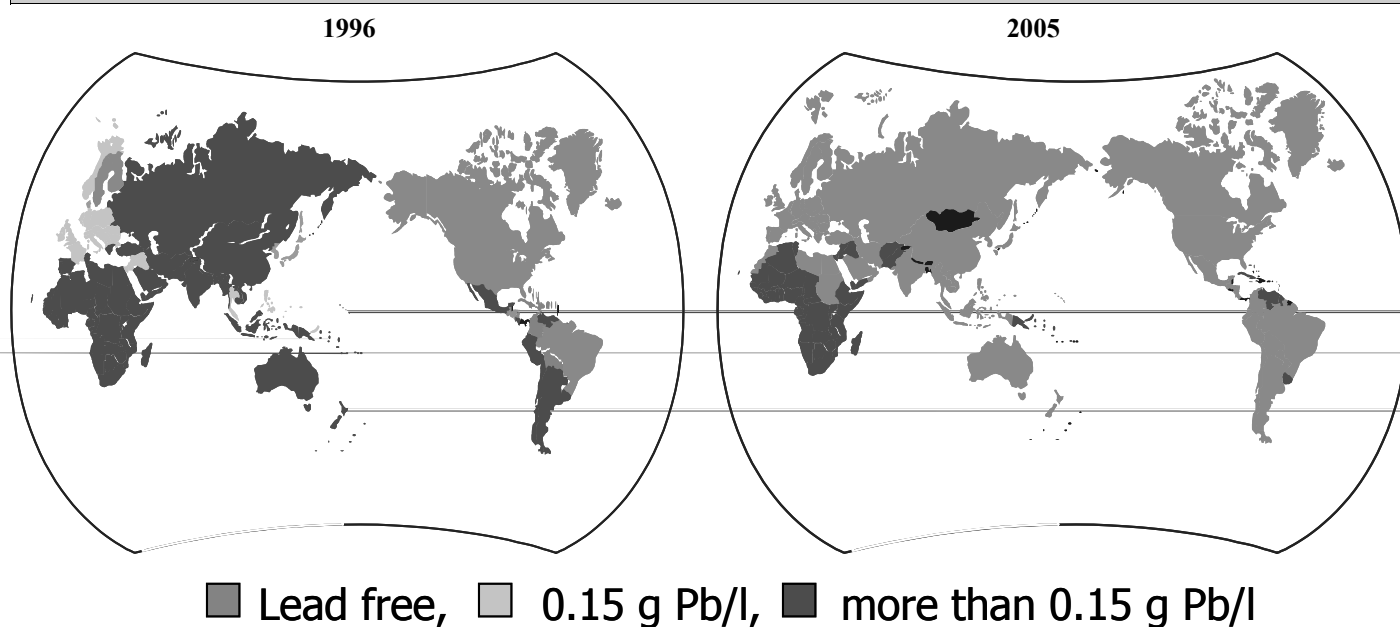
providing a platform for exchanging experiences and successful practices in developed and developing countries, as well as technical assistance;

- Develop: public outreach materials, educational programmes, and awareness campaigns; adapt economic and planning tools for clean fuels and vehicles analysis in local settings; and support the development of enforcement and compliance programmes, with an initial focus on fuel adulteration; and
- Foster key partnerships between Government, industry, NGOs, and other interested parties within a country and between countries to facilitate the implementation of cleaner fuel and vehicle commitments.

DESA hosted the first Steering Committee Meeting for the Partnership at United Nations headquarters in New

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## Status of Lead Phase-Out



**Policy options to support lead phase-out:** Mandatory phase-out by certain date, fuel taxes and other incentive policies, unleaded fuel dispenser nozzle, mandating unleaded pumps, mandate vehicle design for unleaded gasoline.

# The Beijing Assembly and the new GEF

The meetings of the Council and Assembly of the Global Environment Facility (GEF), took place in Beijing, China, in October 2002. The GEF Council approved US\$ 222.29 million in grants for 33 new projects, with co-financing of \$ 459.26 million for projects bringing the total value of these projects to \$ 681.54 million. This is the first work programme to be financed under the Third Replenishment. According to the CEO and Chairman of the GEF, Mr. Mohamed El-Ashry, as of June 2002, the GEF has financed \$ 4 billion in project resources and mobilized an additional \$ 12 billion in co-financing for over 1000 projects in 160 countries and some 3000 small grant activities.

The Second GEF Assembly in Beijing was held in the wake of the World Summit on Sustainable Development (WSSD). The First GEF Assembly, held in New Delhi in April 1998, had resembled the same partnership initiative established as a pilot phase in the course of the UN Conference on Environment and Development in 1992. By the Beijing Assembly the GEF appeared to have evolved into a new Facility with new mandates for the protection of the global environment.

The political decisions and approaches, which were taken either by the GEF during the Assembly and Council meetings in Beijing, or by the GEF Council or other relevant intergovernmental bodies during the period leading up to the Beijing meetings, clearly signify a change in GEF and its quest for new mandates in the areas of global environment and sustainable development. These new decisions and approaches, as concluded or acknowledge in the Beijing Declaration, are briefly described below.

**1. The GEF and new conventions:** The GEF is entrusted to act as a financial mechanism for a number of new environmental areas and multilateral environmental conventions,

as follows:

- a. The Assembly designated "Land Degradation" and "Persistent Organic Pollutants" (POPs) as two new "focal areas" of the GEF;
- b. The Assembly also mandated the GEF to act as the Financial Mechanism of the Stockholm Convention on POPs;
- c. The Assembly confirmed, in response to the WSSD Plan of Implementation, that the GEF shall be available as a Financial Mechanism of the UN Convention to Combat Desertification (UNCCD), if the Conference of the Parties (COP) to the UNCCD should so desire. In light of the continued strong resistance by donor countries in the past, this decision could be seen as a proactive outcome; and
- d. The GEF will also act as the Financial Mechanism of the Kyoto Protocol, as well as its parent, the UN Framework Convention on Climate Change (UNFCCC), and the Bio-safety Protocol, as well as its parent, the Convention on Biological Diversity.

**2. New Executing Agencies:** During the period between the First and Second Assemblies, the GEF designated seven new Executing Agencies (EAs) for the purpose of providing direct access to GEF funds and a greater role in the implementation of GEF projects for these new EAs. These agencies include the four regional development banks and three UN specialized agencies (IFAD, UNIDO and FAO). As a result of this, the previous monopoly held by the three Implementing Agencies over GEF projects has weakened to a considerable degree.

**3. The GEF and new climate change funds:** At the seventh session of the Conference of the Parties (COP-7) to the UNFCCC, held in Marrakech in November 2001, the GEF (already

the financial mechanism of the UNFCCC and its Kyoto Protocol) was requested to manage and operate new Funds established under the intergovernmental climate change regime. These new funds are: the Special Climate Change Fund and the Least Developed Country Fund under the UNFCCC, and the Adaptation Fund under the Kyoto Protocol. It is expected that at the COP-9 the necessary arrangements proposed by the GEF Council for the operationalization of these Funds will be adopted.

**4. The GEF and Sustainable Development:** The following manifest the GEF's increasing attention to sustainable development issues:

- a. *The GEF and the WSSD:* The GEF played a proactive role in and made contributions to discussions in the WSSD process, by arranging a number of high-level roundtables on the main themes of the WSSD and also by presenting reports and showcasing its activities and its contributions to protecting of the global environment during the WSSD;
- b. *The GEF and the concept of sustainable development:* The GEF has recently been highlighting the concept of sustainable development in its deliberations, an indication of its growing understanding and recognition of the need to pursue a more balanced approach to the three pillars of sustainable development. The original GEF approach involved a rather singular emphasis on the environmental pillar, which was built on the principle of "incremental cost". In retrospect, one could say that the strong concerns raised by developing countries in all relevant intergovernmental fora played a key factor in shaping the new attitude and approach of the GEF. In fact, most developing country

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# COP-8 and Sustainable Development

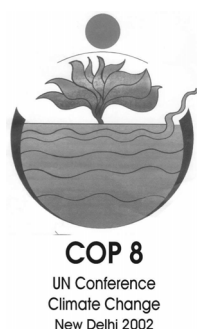
The eighth session of the Conference of the Parties (COP-8) to the UN Framework Convention on Climate Change (UNFCCC) was held in New Delhi, India, in late October 2002. COP-8 is largely viewed as a transitional phase in the multilateral debate on climate change. Although the Marrakech Accords adopted at COP-7 paved the way for the ratification of the Kyoto Protocol, the Protocol had not entered into force by the time COP-8 met. However, the increase in the number of ratifying Annex-I Parties, notably the recent ratification by Canada along with the announcement by the Russian Federation at the World Summit on Sustainable Development (WSSD), has raised expectations that the Protocol will enter into force in the course of 2003.

COP-8 resulted in two major outcomes: firstly, several decisions made to advance the implementation of the Convention and the Kyoto Protocol; and secondly, the Delhi Ministerial Declaration on Climate Change and Sustainable Development. These decisions built on the outcomes of COP-7 and addressed issues such as technology transfer, financial mechanisms, Articles 5, 7 and 8 of the Protocol relating to "reporting requirements", education and training, and Clean Development Mechanism (CDM) issues.

The basic principles and rules for the CDM were agreed in Marrakech and the CDM Executive Board started operation shortly thereafter. COP-8 adopted the recommendations of the Executive Board concerning simplified modalities and procedures for small-scale CDM projects. These projects are to focus mostly on energy efficiency and renewable energy. Given the ratification trend of the Protocol and on-going progress of the work of the CDM Executive Board, it is projected that the first round of CDM projects will be submitted to the CDM Board for consideration and approval by the first quarter of 2003.

The Delhi Ministerial Declaration on Climate Change and Sustainable Development

highlights the link between the WSSD outcome and the UNFCCC process. The Declaration stresses the importance of adaptation to the effects of climate change, and called for diversification of energy supply by increasing the share of renewable energy in the global energy mix, enhancing energy efficiency, and adopting cleaner and less polluting energy technologies, including advanced fossil-fuel technologies. Most of the energy-related elements in the Delhi Declaration repeat the decisions contained in the WSSD



Plan of Implementation (POI), and reflect the growing recognition of the key role of energy issues in the politics of global climate change.

COP-8 discussions were hampered by continued controversy over a number of issues. For instance, no progress was made on issues such as policies and measures, definitions for modalities for inclusion of "sinks" under the CDM, cleaner energy technologies, future action (next commitment period), and minimization policies for the impacts of response measures. The South-North dichotomy became obvious during discussions on a number of agenda items, particularly with regard to a proposal for developing countries to undertake "mitigation commitments" for the Second Commitment Period. Developing countries refused to consider such issues, arguing that poverty eradication and economic growth were their first priority.

Nevertheless, agreement was reached

on certain COP-8 issues, including the Delhi Work Programme on Education, Training and Public Awareness (Article 6 of UNFCCC), simplified modalities for small-scale CDM projects, rules of procedures for the CDM Board, guidelines for Articles 5, 7 and 8, and additional guidance to the Least Developed Countries Fund.

COP-8 took place only six weeks after the WSSD, and sustainable development was still on the minds of the delegates. The title of the Delhi Declaration, references to the WSSD outcome and the inclusion of WSSD POI elements in the Declaration, are all evidence of this link. There was also a growing understanding among the Parties of the strong linkage between climate change and energy, which could be partly attributed to the WSSD: such as the inclusion of renewable energy and energy efficiency in the Delhi Declaration. These trends point to the need for an integrated and balanced approach in dealing with climate change phenomena and in pursuit of sustainable development goals.

In conclusion, COP-8 succeeded in advancing the global climate change debate, and managed to build on the historic achievements of COP-7. It passed on the principle message of the Marrakech Conference of November 2001, "to move forward on the Kyoto Protocol" as the only international instrument in existence to combat climate change and to achieve sustainable development for all, without sacrificing the legitimate interests of the Parties.

At COP-8, it was decided that COP-9 would be held in Rome, Italy, in early December 2003. In light of the expectation of the entry into force of the Kyoto Protocol, the first session of the Conference of the Parties serving as a Meeting of the Parties may be held in conjunction with COP-9. ■

**Learn More:**

[www.unfccc.int](http://www.unfccc.int)

# Market-based Approaches to Energy Efficiency of Boilers

Recent World Bank/GEF projects have addressed the efficiency problems of large-scale coal boilers in China, but the small and medium-scale market still need to be addressed. Poor operational efficiency has been a chronic problem with small-scale coal-fired boilers in China, which consume about 300 million metric tons of coal annually. Studies have identified three key contributing factors: poor operation, lack of maintenance, and variable fuel quality. These factors combined reduce the average operational efficiency of boilers by 10 to 20 per cent. For this reason the UN Foundation requested the UN Department of Economic and Social Affairs (DESA) to conduct a study on these boilers in China and to propose market-based approaches to improve their performance and reduce emissions.

The approximately 400,000 small and medium coal-fired boilers operating in China have unit capacities ranging from less than 1 to 10 ton-steam/hour (1 ts/h = 0.7 MW). More than half of these boilers are used for space heating and the rest are predominantly used in industry. They consume over 300 million metric tons of coal per year and are a major source of air pollution, accounting for about one quarter of China's annual CO<sub>2</sub> emissions.

Technically, over 30 million metric tons of coal per year could be saved by improving the operational efficiency of small and medium coal-fired boilers through low-cost measures, such as training and supervision of boiler operators, routine maintenance of boilers and heat delivery systems, minor retrofits, and the use of graded coal.

Surveys show that the energy efficiency of new boilers usually declines by about 10 per cent after just one year of service because of these problems. The energy saving potential of small and medium boilers has long been recognized but remained untapped due to institutional as well as market barriers. These savings would be disaggregated

because users are dispersed. Thus, the incentive for efficiency improvement is small or non-existent for individual boiler owners, especially when coal is relatively cheap and pollution regulation is poorly enforced. In addition, the financing of energy efficiency projects for coal-fired boilers has been difficult to obtain for various reasons. Previous attempts to capture this energy saving potential have focused primarily on one-time technical fixes and have been unsuccessful due to the lack of a sustained mechanism.

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*...the incentive for efficiency improvement is small or non-existent for individual boiler owners, especially when coal is relatively cheap ...*

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The skills and experience of boiler operators are crucial to maintain boiler performance, but boiler operation not considered a profession in China. Professional knowledge is not accumulated or shared, best practices go unnoticed, and most space-heating boiler houses only employ seasonal workers with minimum supervision.

In order to raise and maintain the standard of boiler operation efficiency in China at a high level, innovative approaches must be sought so as to overcome existing institutional and market barriers. Such new approaches should be able to aggregate small savings (to amplify market incentive), sustain technical improvements, and build professional capacity, thus, turning boiler operation and maintenance into a commercial business. Experiences in other countries and in China indicate that energy services companies (ESCOs) could be an appropriate vehicle to deliver these results. The ESCOs would: provide boiler operation and maintenance (O&M) services to businesses and institutions that are willing to contract out boiler houses in return for a share of the cost savings resulting from

efficiency improvements; or sell steam/heat directly to users.

With an average of 15 years of service life, the stock turnover of coal-fired boilers is low. Recent trends suggest that small and medium coal-fired boilers are gradually being phased out of downtown areas of many large cities because of air pollution control. But their use in peri-urban areas has increased. Overall, the stock has increased slightly. Due to the relatively low economic costs of using coal and the Government's concern about national energy security, coal is likely to remain the principal fuel source for space heating and industrial boilers over the next 20 years.

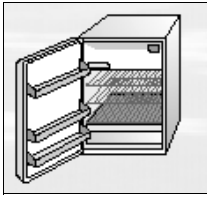
The study concluded that it might be useful to promote market-based mechanisms for energy efficiency improvements that, among other things, might (a) introduce energy management outsourcing for the maintenance of small-scale industrial boilers; and (b) improve the quality of coal delivered to boiler operators, using aggregated coal demand as a leverage. ESCOs could be established specifically to provide energy efficiency services to the boiler market.

Based on an assessment of the local situation, the DESA study recommends several business models that could be tested, given the current players and market conditions in China. They include the following:

1) A boiler ESCO operates as a heat or steam provider according to contractual terms. The ESCO would not own boiler houses, but, in the case of new installations, could help arrange financing and/or package financial incentives under the contract. In such cases, the ESCO would be responsible for the sales, installation, operation, and maintenance of the boiler house. Such ESCOs would initially target new boiler installations. The market for such services among existing boiler houses would also be explored in order to foresee future replacement orders.

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# Energy Efficient Refrigerators in China



A UN project in China is successfully catalysing the production of a new generation of efficient refrigerators that

should arrive on the domestic market by the end of 2003. The average energy efficiency of refrigerators in China has increased by 14 % since 1999 and the market share of super-efficient refrigerators is increasing dramatically. These are the principal conclusions of a meeting organized in Beijing in November 2002, to review a project funded by UNDP/GEF and being implemented by China's State Environmental Protection Administration in cooperation with the UN Department of Economic and Social Affairs (DESA).

The project recently completed 3 years of activities in a five-year cycle. The aim of the various training and technical assistance activities during the first half of the project is to build the capacity of Chinese refrigerator manufacturers for research, design and optimisation of more energy-efficient refrigerators. This is combined with a manufacturers financial incentive programme to ensure that they have both the capability and the incentive to upgrade their designs and production technologies.

At the outset, a large number of refrigerator models and compressors produced in factories in China were based

on designs developed in foreign companies. There was little experience in refrigerator research and development and engineers were not required to design new models or further develop existing models, nor did they attempt to optimise their operation to reduce energy consumption.

Now at the mid-point of the project, the results of a range of "technology push" activities can be seen. After the development of a revised energy-efficiency performance standard for refrigerators, combined with an intensive refrigerator design training programme and five technical assistance trips by international and domestic experts, significant changes are evident. Factories that previously relied on imported refrigerator designs are now developing their own designs or are starting to do so. R&D programmes are much more widespread, indicating that a higher level of resources being made available for product development. This represents a shift from merely manufacturing refrigerators to developing them. As a result, the skill base of the engineers is being enhanced in the design and development of new models and in optimising their operation. Most factories are developing at least one more-energy-efficient refrigerator. This is a significant change.

Most manufacturers needed substantial support and incentive to embark on R&D programmes for the development

of more-energy-efficient refrigerators. The design training programme, study tours, technical assistance visits, new minimum energy performance standard for refrigerators, and incentive programmes are all having the expected impact on the Chinese manufacturers. The result is that capability for R&D has been established or enhanced for all manufacturers. The project is clearly catalysing the production of a new generation of efficient refrigerators that should appear on the market by the end of 2003.

With the successful completion of this first phase, the project will now turn to a new set of activities to ensure that the market for these efficient refrigerators is strong. These activities will raise the awareness of Chinese consumers of the benefits of energy-efficient refrigerators and try to influence their purchase decisions. Project- and manufacturer-funded advertising campaigns will be nationwide and will reach millions of consumers. An incentive programme for retailers will educate and provide financial incentives to sales people at retail outlets. A new refrigerator information label will inform consumers about energy efficiency at the point of sale. The combined impact of these activities will be measured by consumer awareness tracking surveys. Together it is hoped that these activities will transform the Chinese refrigerator market towards ever-higher levels of energy efficiency. ■

## Partnership for Clean Fuels continued...

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York on 14-15 November 2002. Fifty members of the partnership attended the meeting and discussed the development of a preliminary work plan. The partners established a clearinghouse, with a number of partners pledging financial resources to support its operation.

Separate discussions were held to explore needs and opportunities in different regions of the world. Partners

shared available information and described current efforts in Africa, Asia, Latin America and Eastern Europe. Several partners are engaged in specific efforts and were able to solicit the assistance of other partners at the meeting. Three working groups were also established to develop coordinated statements regarding valve seat recession, octane levels, and the relationship between sulphur and particulate levels. The intention of the

partnership is to work closely with individual countries having a political will for change in order to assist them in eliminating the use of lead in gasoline and reducing the level of sulphur in gasoline and diesel fuels in the context of reducing vehicle emissions to improve urban air quality. The approach to achieving this goal will be different in each country depending on the relevant local circumstances. ■

# Wind Resources in China: A Concession Model

The rapid economic growth rate in China requires a supporting energy infrastructure, and historically the country has met increased demands for electricity by burning more coal. Environmental concerns at the local, regional and international levels have shifted attention to cleaner, renewable energy resources such as wind energy. Wind energy was the fastest growing form of energy technology in the world during the past decade, with a worldwide installed capacity of more than 31,000 MW by the end of 2002.

About 460 MW of this capacity is located within China, a level well below that of developed countries like Germany (>12,000 MW) or the United States (>460 MW), or even other large developing countries such as India (>1700 MW). The Tenth Five-Year Plan calls for more than a four-fold increase in wind-power capacity by the year 2005. China has abundant wind resources, and the environmental benefits of utilizing this renewable resource are likely to be considerable.

But wind-powered electricity still costs about twice as much as coal-powered electricity in China, and it simply cannot compete with fossil-fuel alternatives at the present time. This is also the case in much of the rest of the world, where conventional technologies typically have lower costs than wind power. Yet more than 6,000 MW of wind power were installed worldwide in 2001, an annual increase of 31%. By itself, the US state of Texas was responsible for 915 MW, more new wind capacity than had ever been added in that country in any single year.

The seeming discrepancy between these cost and growth statements arises from the fact that Governments around the world have determined that environmental and other characteristics associated with this renewable resource deserve consideration. Wind power has flourished because of governmental policies encouraging its development.

There are myriad forms of governmental support, including research and development funds, production tax credits, customs tariff removal, tax relief, etc. But the two most significant governmental support policies for renewable energy systems (RES) are those which:

- Offer price-based support, typically in the form of a feed-in tariff for the RES-generated electric power; or



*With a total of 179 turbines and 87400kw installed capacity, this wind farm located in the Dabancheng area of Xinjiang Uygur Autonomous Region, PR China is both the first and largest farm in the country.*

- Employ quantity-based obligations, which are often met through the trading of “green certificates” associated with RES power generation.

In China, another new idea surfaced in the late 1990s: the potential use of wind resource concessions (WRC). Under the WRC, the Government would offer exclusive access to wind energy resources for development, and put such concessions out for bid—much like it currently does for oil and natural gas resources. China’s State Development Planning Commission (SDPC) drafted guidelines for the WRC in late 2001, and they were the topic of discussion in a meeting held in Guangzhou in November of that year. These guidelines remain to be finalized and issued, although the government has allowed two WRC projects to proceed.

The WRC has been proposed as a renewable energy policy mechanism designed to move China towards a state of affairs in which private sector power developers would utilize international commercial financing to invest in large, base-load, state-of-the-art wind units, employing turbines manufactured in China, at international quality standards but at a price perhaps 20-30 % lower than international market rates. This represents a very different wind power

programme from the one that currently exists within China, however. The current system relies primarily on relatively small turbine units manufactured domestically often for localized consumption by residential/commercial units on an intermittent basis, or else larger (often imported) units for power generation linked to the nearby grid. The country does not

yet manufacture the 1.5-MW units that now represent the state of the art in most wind power applications in Europe and the U.S.

It appears unlikely that the WRC programme alone will be able to accomplish such a major transition. This is because the WRC model only indirectly addresses the most important problem with wind power—its high price. The scale economies and siting advantages garnered through WRC alone will not overcome the fact that these units cannot currently compete with fossil-fuelled alternatives. The wind units will require governmental support in the near term.

Introducing governmental support means that institutional factors will play a critical role, and that wind power development must be considered within the broader context of China’s renewable energy programme. Both price and quantity mechanisms are available to provide such support, but institutional problems have already been blamed as the principal reasons behind China’s slow development of its wind resource. Addressing the form of support also means tackling the country’s institutional infrastructure.



# Wind Power in China continued...

(Continued from page 8)

In order to address these issues, UN DESA has suggested a relatively measured, slow, “learn-as-you-go” approach for developing wind power. It suggests China initially adopt a price-based support programme in the early stages (i.e., 2003-2007), fostering industrial development in wind energy. There should be numerous relatively small-scale projects, designed as much to “prime the pump” for that industry as to provide cost-effective wind power, but really designed to give the country time to build up its institutional infrastructure in this area.

A second phase (2008-2014) would move towards larger scale projects, more rigorously sited. The emphasis to shift from institution building towards more cost effective power delivery. More risks would be shifted towards the concessionaire and, in the latter stages, the Government would begin to move more towards a market-oriented quantity approach, beginning Renewable Portfolio Standard type pilot projects in individual provinces or regions.

In the post-2015 period, after both the industrial and institutional frameworks have been developed and the country has tapped into the experience of both European and U.S. market-based approaches, it would move towards a fully market-oriented system, one consistent with the rules and modalities of the Clean Development Mechanism (CDM) and other international environmental markets.

Several other salient features of such a transition are required.

- The support scheme should be national in scope, with a commitment to wean the nascent wind-power industry from donor and multilateral agency funding support.
- The nature of the concessions granted must change over time, beginning with narrow “project development rights”, but moving towards large-scale concession tracts similar to oil and natural gas concessions after 2015.
- Wind power requires an institutional “champion,” given the task of increasing the installed capacity

of this renewable resource and charged with implementing the WRC.

Future progress in wind power development in China will ultimately depend more upon the institutional framework in which it is implemented than any technical characteristics of the policy mechanism. Governmental support at the national level is necessary, and the means of providing such support has been contentious in all countries. China should aim to make the transition from price- to quantity-oriented support over time, when it has developed both the industrial and institutional capacity to do so. If it follows such a plan, then China will be well situated to assume a dominant position in this important renewable energy industry in the future. ■

*A more detailed account of UN DESA's approach can be found in a forthcoming issue of China Environment Series (#6), published by the Woodrow Wilson International Center for Scholars ([www.ecsp.si.edu](http://www.ecsp.si.edu)) and in a forthcoming UNDP report for project CPR/97/005*

# Energy-Efficiency of Boilers continued...

(Continued from page 6)

2) A boiler service company operates as a maintenance provider, offering preventive maintenance services and low-cost retrofits in return for a share of measurable energy cost savings. It is envisaged that such companies could eventually evolve into ESCOs as their capacities develop. This type of company would initially target existing boiler houses.

3) A boiler ESCO operates as a vendor of graded coal, profiting from selling coal that burns cleaner and more efficiently. This approach is very effective for the smallest boilers (0.5 to 1 ts/h), which usually have a fixed bed and are hand-stoked, but also has the potential to supply boilers of any size with blended coal containing catalysts to

reduce SO<sub>x</sub>, and NO<sub>x</sub>, and enhance combustion.

4) A boiler service company operates as the service division of a boiler manufacturer. Boiler manufacturers already provide corrective maintenance (when a problem occurs) under the warranty provision (usually 18 months). The service company model would allow for the provision of long-term maintenance contracts under a shared savings agreement. The principal interests of this model to boiler manufacturers include:

- Benefit from their current know-how in developing additional business activities and creating a new profit centre;
- A better relationship with current clients involving contact with them

over the life time of their boilers and therefore potentially increasing the likelihood of being chosen to supply new equipment when the time for replacement is reached; and

- A new market for potential clients who currently do not use boilers produced by the manufacturer.

5) A boiler service company operates as a service arm of a large district heating plant (DHP). The potential market would be other smaller DHPs that do not have the same technical capacity in relation to maintenance and operational standards as have the larger ones. Information gathered during meetings indicates that some DHPs are already providing technical services on a fee basis to other DHPs. ■

# ETB welcomes Mohammad Reza Salamat

**Mohammad Reza Salamat**, who joined the Energy and Transport Branch of the Division for Sustainable Development in January 2002 as an Interregional Advisor on Energy for Sustainable Development, is an environmental diplomat with extensive experience in negotiating multilateral environmental and sustainable development issues. He holds BA and MA degrees in International Relations with a focus on international environmental concerns.



Mr. Salamat, who acted as the spokesperson of the Group of 77 during 2001 when Iran was the Chairman of the G-77, was instrumental in the achievement of a consensus and political agreement on the outstanding issues of the Kyoto Protocol during the second part of the sixth session of the Conference of the Parties (COP-6) in Bonn, Germany, in July 2001, as well as at the seventh session of the COP in Marrakech, Morocco, in November 2001. The agreement reached on the outstanding issues not only broke the impasse faced during negotiations on the rules and guidelines for the market-based mechanisms of the Kyoto Protocol in The Hague, Netherlands, in November 2000, but also saved the embattled Kyoto Protocol and, therefore, paved the way for its subsequent ratification by industrialized countries.

Mr. Salamat also co-chaired the Ad-

Hoc Intergovernmental Group of Experts on Energy and Sustainable Development during 2000-2001 in preparation for the ninth session of the CSD, the main focus of which was energy. The successful discussions and comprehensive agreement on key energy issues, which were being discussed fully at the UN for the first time comprehensively and in the context of sustainable development, was based on the diplomatic skills and consensus-building abilities of Mr. Salamat and his Co-chairperson, Ms. Irene Freudenschuss-Reichl.

He also functioned as an alternate member of the Council of the Global Environment Facility (GEF) from 1998-2002, and was until recently a founding member of the Executive Board of the Clean Development Mechanism (CDM) of the Kyoto Protocol. Mr. Salamat has written numerous articles on environmental and sustainable development issues, particularly concerning climate change.

At DESA, Mr. Salamat is continuing work in his field of expertise, by developing programmes and activities which link climate change, energy and sustainable development through such mechanisms as the CDM, the GEF and public-private partnerships. ■

## The WSSD continued...

*(Continued from page 1)*

to take action, where appropriate, to phase out subsidies in this area that inhibit sustainable development. The Plan encourages Governments to improve the functioning of national energy markets so that they support sustainable development, overcome market barriers and improve accessibility.

In addition, public-private partnerships to promote energy for sustainable development were encouraged by Governments, and a number of

partnerships were announced at the Summit. These partnerships include the Clean Fuels and Vehicles Partnerships, the Global Village Energy Partnership, the Alliance for Rural Energy in Africa, and the Global Network on Energy.

In addition to the negotiation sessions, panel discussions were organized around each of the WEHAB (water, energy, health, agriculture, and biological diversity) themes. Panellists were selected to represent each of the

major groups in an interactive discussion moderated by Mr. Jan Pronk, Special Envoy of the Secretary-General for the WSSD. The energy panel session involved a lively exchange of views on the implementation of the follow-up to the WSSD with regard to this topic. ■



**Learn more:**

**[www.un.org/esa/sustdev](http://www.un.org/esa/sustdev)**

# DESA and e7 back energy for sustainable development

During the World Summit on Sustainable Development, the e7 Fund and the United Nations Department for Economic and Social Affairs signed an agreement that, in contributing to the achievement of the objectives of the United Nations Millennium Declaration, commits the partners to cooperation "in energy activities and projects that promote sustainable development ... in particular, actions for initiating renewable energy projects designed to enhance the prospects for positive environmental, social and economic impacts, to provide real, measurable and long-term benefits through mitigation of climate change, and to facilitate reductions in emissions of greenhouse gases..."

The e7 group consists of nine leading electricity companies in G7 countries, namely American Electric Power



(USA), Electricité de France, Hydro-Québec (Canada), Kansai Electric Power Company (Japan), Ontario Power Generation (Canada), RWE AG (Germany), ScottishPower (UK), and Tokyo Electric Power Company (Japan). This group conducts activities and projects, and acts as project developer in support of activities and pilot projects that promote the principles of energy for sustainable development

and contribute to the economic welfare of beneficiary communities.

The partnership is dedicated to "demonstrating feasible approaches for global collaboration and presenting innovative models of development cooperation which can satisfactorily be replicated in other countries and sectors."

It is expected that joint e7-DESA activities will be launched in 2003 in a number of energy areas and regions in support of sustainable development, particularly to promote the capacity building for Clean Development Mechanism activities in developing countries. The first such activity was a joint e7-UNDESA Workshop and Luncheon on Renewable Energy Technology Diffusion held in conjunction with the eleventh session of the Commission on Sustainable Development. ■

## The GEF continued...

(Continued from page 4)

Ministers at the GEF Assembly underscored the linkages between poverty eradication and environmental protection, and invited the GEF to consider these linkages in its policies and programmes;

- c. *The GEF and energy:* The GEF indicated, in various ways in the course of the WSSD, a particular interest in playing a role in global energy issues; and
- d. *The GEF and the CSD:* The GEF Council in Beijing briefly discussed the WSSD outcome and the required follow-up. It decided to undertake a substantive discussion, at its next meeting in May 2003, on the outcome of the WSSD and decide on the responses that the GEF can provide.

**5. The GEF and a programmatic approach:** The GEF has decided to

pursue a programmatic approach and enhance its strategic business planning whereby recipient countries would be asked to mainstream GEF goals and policies in their overall development plans. In other words, the GEF would function as more than a mere financier of environmental projects.

**6. The GEF and co-financing:** The new GEF criteria for approving projects, which require a higher co-financing ratio from other sources for GEF projects, would place the GEF at the centre of international financial institutions and would facilitate their contributions to the cause of the GEF.

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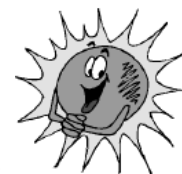
**8. The GEF and the private sector:** The GEF is moving smoothly towards a new framework for active interaction with the private sector, aimed at engaging them more directly in its overall work and projects.

**9. The GEF and the Third Replenishment:** The level of the Third Replenishment of the GEF, which was agreed upon at \$ 2.92 billion in August 2002, and subsequently increased to \$ 2.97 billion, as a result of the additional contributions made at the WSSD, was the largest replenishment since the inception of the GEF. This substantial increase in replenishment demonstrates the confidence donor countries have in the effectiveness of their investment in the GEF and its future role.

**10. The GEF and an independent legal status:** The GEF senior management has been striving

# Diversions

## Solar Energy for All



太阳能 SOLAR ENERGY СОЛНЕЧНАЯ ЭНЕРГИЯ सौर ऊर्जा ENERGÍA SOLAR সৌর শক্তি  
 SONNENENERGIE ENERGIA SOLAR الطاقة الشمسية 太陽エネルギー ENERGI MATAHARI  
 ÉNERGIE SOLAIRE सूर्य शक्ति ENERGIA SOLARE شمس توانائی DAYANING SURYA 태양에너지  
 ශ්‍රායිත්‍රිභ්‍යලාභ ඔත්තල් සාරය ජල දි පාක්‍ය දහොප GÜNEŞ ENERJİSİ СОЛНЕЧНА ЕНЕРГИЯ  
 NĂNG LƯỢNG MẶT TRỜI ENERGIA SŁONECZNA সূর্য শক্তি СОЛАРНА ЕНЕРГИЈА ಸೂರ್ಯ ಶಕ್ತಿ  
 انرژی خورشیدی ကုဏ္ဍဝါစုံ KARFIN HASKEN RANA ལྷན་ཞུ་ལྷ་མོ་ NISHATI YA JUA နေ့စွမ်းအင်  
 พลังงานแสงอาทิตย์ ENERHIYA NG ARAW ENERGIE SOLARĂ SOLENERGI ZONNE ENERGIE  
 සුරන ජි සරනි දමරනරු SLUNEČNÍ ENERGIE ÉNESI PANON POÉ قوت سورج NAPENERGIA  
 TENAGA SURIA AGBARA ŌRUN SEMBE DIGA NAANGE IKE ANYANWU မင်းသိ ချာက မေတ္တဝါဝိ  
 AMANDLA ELANGA ထွတ်ဝ ရေထိ ဝေဇာ KYEH ЭНЕРГИЯСИ گەون انرژىسى ΗΛΕΙΑΚΗ ΕΝΕΡΓΕΙΑ  
 ENERHIYA SA ADLAW سج جي قوت **የፀሐይ ፡ ኃይል** СЛЪНЧЕВА ЕНЕРГИЯ SUNČANA ENERGIJA  
 ENÈGI SOLÈY **ሀ-ምና ፡ አዱ** ወይንስ (ጥቅም) KOWADDA PANASSA AREH HERIN'NY MASOANDRO  
 INTI KALLPA UMULIRO W'IZUBA ཉི་མའི་ནམ་མཁའ་ KYH ЭНЕРГИЯСЫ OWIA AHOODEN DAI5YAN2 NƏN2  
 AURINKOENERGIA ENERHIA ITI INIT TIYA I NTANGU ENERGI DEL SOLELH SLNEČNA ENERGIA  
 TABARTA QORAXDA KUYAX ENERGIYISI ENERGI DIELLORE **ԱՌԼԱՐ ԷՆԵՐԳԻՅԱ**  
 KYHӨШ ЕНЕРКИЈАСЫ **ᠬᠡᠭᠣᠨ ᠪᠪᠤ ᠣᠪᠣ** HXO BBU WE ENERHIYA SANG ADLAW NGUYA YA MOYI  
 TANAGO MATOARI **ਸਿੰਗ ਬਾਗ਼ ਭਾਕ** **የዩታላ ፡ ኃይል** PAYU MATAN-AI روج تاب KILE BARKA  
 ENERHIA HALI SA ALDAW AWATANGENNA MATANNA ESSOE ŌDUDU UTIN ᠨᠳᠣ ᠵᠠᠷᠠ  
 AMAANYI GA ENJUBA **אנרגיה השמש** DONO KAUSU BE هيزي هه تاوي آفتابكوت  
 HINYA WA RIUA SAULÈS ENERGIJA BUKOLE BWA MUNYA UTAÑA UÁTUA TAIYANG NENG  
 NGUYA EA WANE WĪNTOOG TUULEM MPHAMVU YA DZUWA SIMBA RE ZUWA  
 MATLA A LETSATSİ CUARAJHY MBARETÉ KATAN U JANTE BI

## The Energy and Transport Branch

The Energy and Transport Branch of the Division for Sustainable Development (DSD) of the Department of Economic and Social Affairs (DESA) services the inter-governmental processes of the United Nations in the fields of energy and transport, prepares analytical studies on these subjects, and provides advisory services to governments and technically supports energy projects at the field level.

These services focus on increasing the supply of energy services in developing coun-

tries, particularly in rural areas, and managing the demand for energy, largely through energy efficiency efforts. Such technical assistance is directed toward capacity building, institutional strengthening, promoting increased energy investments, and expanding the role of the private sector and local communities.

With a core staff of fourteen in-house energy experts and with over 200 associated consultants, the Branch has the capacity to technically backstop projects dealing with

all aspects of this highly diverse sector around the world.

For more information on the projects outlined in this newsletter, please contact:

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