



# zonAction



UNEP DTIE tri-annual publication • OzonAction Programme under the Multilateral Fund

*A newsletter dedicated to the protection of the ozone layer and implementation of the Montreal Protocol*

## Viewpoint

*Yesterday's achievements and tomorrow's challenges*



The Ozone Secretariat welcomed **Mr Marco González**, its new Executive Secretary, at the beginning of June. Mr González, a Costa Rican national, has a distinguished record in

environmental issues and intergovernmental negotiations, including serving as Vice-Minister in Costa Rica's Ministry of Environment and Energy, and as Vice-Chairman, then Chairman, of the ExCom.

I am honoured to be joining the Ozone Secretariat at a time when the Parties have so many reasons to feel proud of past achievements but still face very real challenges, both individually and collectively. This is a time when the Montreal Protocol is evolving. It is a time when Article 2 countries, including those with economies in transition, have made significant progress in phasing out ozone-depleting substances (ODS). It is also a time when most Article 5 countries are making significant efforts to comply with control measures. Most importantly, it is a

time when all the Parties have declared their continued commitment to meet their obligations under the Protocol.

We are now at a critical juncture where we must strive to achieve closer cooperation and further synergy between the Parties and the responsible institutions. This will require an appropriate replenishment of the Multilateral Fund (MLF) to enable Article 5 countries to continue phasing out the use of ODS. It will also require efforts by all countries to phase out CFCs for critical uses, as well as methyl bromide and HCFCs, in a manner that protects the global environment but also guarantees sustainable agriculture, access to safe and affordable medicines, increased energy efficiency of industries and availability of ozone-friendly products.

I can assure you that the Secretariat will devote itself to facilitating the discussions of the Parties, supporting and servicing their meetings, executing their decisions, providing advisory assistance as required, and promoting the implementation of the Protocol and its Amendments.

And finally, for world leaders gathering in Johannesburg, the success of the Montreal Protocol will be a 'star' to guide continued efforts, in both hemispheres. In the midst of these celebrations, we should also express our

## Contents

Viewpoint	1
China's Industry Park	1
News from international agencies	2
TechTalk	3
World Policy Roundup	5
Dialogue and Discussion	6
Customs training	7
New Publications	8
Science news	8
The progress in ratification of the Montreal Protocol and its amendments	9
The National Ozone Unit Interview	10
Forthcoming Meetings	10

gratitude to those who have made so much possible—including, of course, our former Executive Secretary Mr K. Madhava Sarma. Let us all continue working for the benefit of humankind.

### New publication

*A United Nations history of the Montreal Protocol*, by Dr S.O. Andersen and Mr K.M. Sarma (see page 8)



## Innovative methods to support MEAs: China's Industry Park



*Artist's conception of the Industry Park*

China's State Environmental Protection Administration (SEPA) has established an Industry Park to help China reach and maintain compliance with the Multilateral Environmental Agreements (MEA) to which the country is party. In the initial phase, the specially designed park is focusing on the Montreal Protocol.

To better understand the concept of the Industry Park and how it works, we interviewed Mr Liu Yi, Director General of China's Foreign Economic Cooperation

Office, who initiated the Industry Park concept and has been working to make it a reality.

*What made SEPA propose the building of an Industry Park for implementation of MEAs?* From 1997, the innovative approach adopted by the Executive Committee (ExCom) allowed China's government some flexibility in use of funding to achieve phase-out targets agreed under the Montreal Protocol.

*continued on page 9 ...*

## News from international agencies



### Fund Secretariat

The Fund Secretariat prepared policy papers and reviewed work programmes, projects and

the 2002 business plans of the implementing and bilateral agencies for the 36th ExCom, held in March 2002. It presented the 2002 consolidated business plan of the MLF and other policy papers to the meeting. ExCom approved the 2002 business plans as well as US\$53.8 million for projects.

The Secretariat also participated in international meetings including six regional network meetings. In May 2002, its Chief Officer had discussions on MLF and Montreal Protocol issues with the Chairman of the ExCom and government officials and stakeholders in Nigeria. He also had discussions in Nairobi with UNEP's Executive Director and with officials of UNON and the Ozone Secretariat.

**Contact: Dr Omar El Arini, Secretariat of the Multilateral Fund, 1800 McGill College Avenue, 27th Floor, Montréal, Québec H3A 3J3, Canada, tel: +1 514 282 1122, fax: +1 514 282 0068, e-mail: secretariat@unmfs.org, www.unmfs.org**



### UNEP DTIE

The 36th ExCom endorsed UNEP's 2002 Business Plan at US\$13.9 million and approved UNEP's

strategically re-oriented Compliance Assistance Programme (CAP). CAP will focus on regional delivery and speedy assistance. ExCom also approved a regional phase-out strategy for Pacific Island countries (see page 7), a Refrigerant Management Plan (RMP), four Institutional Strengthening (IS) renewals, five new IS projects and two Country Programme (CP) updates.

An independent review of UNEP's clearinghouse function showed that, overall, UNEP communicates actively with the users of its information services and adapts its programme to their changing requirements. Specific recommendations were made to further improve the clearinghouse services (for full details see <http://www.uneptie.org/ozonation/> feedback). UNEP also assisted the Government of India in developing a voluntary industry pledge (see page 6).

**Contact: Mr Rajendra Shende, UNEP DTIE, 39-43 quai André Citroën, 75739 Paris Cedex 15, France, tel: +33 1 44 37 14 50, fax: +33 1 44 37 14 74, e-mail: ozonation@unep.fr, www.uneptie.org/ozonation**



### UNEP Ozone Secretariat

The Ozone Secretariat organized the 22nd meeting of the Open-ended Working Group (OEWG) of the Parties to the Montreal Protocol, held in Montreal on 23-25 July 2002, and the 28th meeting of the Implementation Committee, also held in July. Important subjects prepared for the OEWG's consideration included procedures for adding new substances to a treaty, monitoring of international trade and prevention of illegal trade.

The Secretariat provided data to the TEAP's Replenishment Task Force, and assisted with the printing and dispatching of the Task Force report on the assessment of the funding requirement for replenishment of the MLF for the 2003-05 period. The report is to be presented to the OEWG meeting and considered by the Ad-Hoc Working Group of the Parties.

**Contact: Mr Marco González, Ozone Secretariat, P.O. Box 30552, Nairobi, Kenya, tel: +254 2 623 885, fax: +254 2 623 913/623 601, e-mail: marco.gonzalez@unep.org, www.unep.org/ozone**



### UNDP

Some 1,182 ODP tonnes will be eliminated thanks to a decision at the 36th ExCom to approve the Annual Progress Report on the Implementation of the China Solvent Sector Plan and project preparation in 30 countries. A performance-based agreement project was also approved which will phase out 179 ODP tonnes of methyl bromide used in tobacco and open-field vegetable seedbeds in Argentina. The project training programme will target more than 70,000 farmers.

**Contact: Dr Suely Carvalho, Montreal Protocol Unit, UNDP, 304 East 45th Street, Room 9116, New York, NY 10017, USA, tel: +1 212 906 5004, fax: +1 212 906 6947, e-mail: suely.carvalho@undp.org, www.undp.org/**



### UNIDO

The 36th ExCom meeting approved 32 Project Preparation projects of which 13 covered national and sectoral phase-out plans, and one RMP. Training programmes/awareness-raising workshops and a country programme were also approved in the methyl bromide sector, as well as seven investment projects in the foam, solvents and fumigants sectors.

The ExCom, in principle, approved funding for closure of the entire production capacity in DPR Korea for CFCs, carbon tetrachloride and trichloroethane, and for development of capacity to produce alternatives to these ODS.

UNIDO also began work for the 37th ExCom, preparing 19 investment projects in the foam, fumigants, refrigeration, solvents and process agents sectors, 4 RMPs, 1 national halon management plan and 4 investment projects for bilateral cooperation.

**Contact: Mrs H. Seniz Yalcindag, UNIDO, P.O. Box 300, A-1400 Vienna, Austria, tel: +431 26026 3782, fax: +431 26026 6804, e-mail: yalcindag@unido.org, www.unido.org**



### World Bank

The 36th ExCom approved funding to support two World Bank work programmes for CFC production closure plans in China and India, the commercial refrigeration sector plan in China, and an investment project in the aerosol sector in Argentina. The ExCom also approved the Bank's request for US\$425,000 to fund project preparation, in addition to the US\$180,000 approved by the 35th ExCom. This brought total approvals for the Bank to date to US\$485 million, with 105,524 ODP tonnes phased out.

The Bank also held its sixth annual workshop for Financial Agents attended by representatives from National Ozone Units (NOUs). The theme of this year's workshop was 'the Multilateral Fund at a crossroad', with a focus on the concurrence between traditional projects and new strategic approaches.

**Contact: Mr Steve Gorman, World Bank, 1818 H Street NW, Washington, DC 20433, USA, tel: +1 202 473 5865, fax: +1 202 522 3258, e-mail: sgorman@worldbank.org, www.esd.worldbank.org/mp**

# TECH TALK

*TechTalk showcases commercially-available technologies that reduce or replace ODS, as well as technologies currently under research. Without seeking to endorse any technology or product, TechTalk covers all technologies permitted under the Montreal Protocol, including those using transitional substances (HCFCs) and not-in-kind alternatives. We welcome information and contributions from all interested parties.*

## REFRIGERANTS

### Carbon dioxide for mobile A/C systems

Japanese automotive supplier DENSO International believes that carbon dioxide (CO<sub>2</sub>) may be a viable alternative to refrigerants used in vehicle air-conditioning systems. The company, like others in the automotive industry, is interested in CO<sub>2</sub> because it has one-thousandth of the global warming effect of HFC-134a, which replaced CFC in air conditioners. HFC-134a is included in the Kyoto Protocol 'basket' of greenhouse gases.

DENSO is working on a CO<sub>2</sub> heat pump system that would provide heating and cooling in one unit. The company has successfully applied CO<sub>2</sub> in a water heat pump, and found that the heat pump gave the expected thermodynamic saving compared to a natural gas system. It presented the CO<sub>2</sub> technology on its FCHV-4 fuel-cell hybrid car at the Earth Technologies Forum in Washington D.C. There are, however, remaining challenges to the development of such systems including problems of cost, additional weight, reliability and maintenance.

**Contact:** Hirata Toshio, DENSO Corporation, Air Conditioning R&D Dept. 1, e-mail: hirata@ra1g.denso.co.jp

### Carrier improves chiller performance

New chiller technology that combines use of the non-ozone-depleting HFC-134a refrigerant with a high-efficiency variable speed screw (VSS) compressor-based chiller system is up to 48 per cent more efficient than comparable tonnage chillers, according to Carrier Corporation. Unveiled in March 2002, Carrier's 'Evergreen VSS™' system incorporates innovations in screw compressor design, advanced materials and manufacturing processes, bearing and lubrication systems, sound and vibration prediction and reduction, advanced variable frequency motor speed control, power factor improvement, harmonic distortion

reduction, and control integration. The product will be available in the water-cooled chiller market's largest segment, i.e. below 500 tonnes refrigeration capacity, the size range that represents 60 per cent of all large water-cooled chiller sales.

**Contact:** Jim Mangini, product manager, Evergreen VSS, tel: +1 704 921 3835, www.carrier.com

### Alternative refrigerant gaining ground

Virtis, a provider of freeze-drying equipment to the life-science industries, has announced that it is to produce units using non-ozone-depleting NU-22 as a replacement for the HCFC-22 refrigerant. NU-22 is a patented refrigerant blend of HFC-125, HFC-134a and n-butane made by ICOR International, USA, with zero ODP and which duplicates the operating pressures and capacity of HCFC-22.

Virtis' vice-president explained that the company had made the switch because HCFC-22 is no longer acceptable in new equipment in Europe. By using NU-22 Virtis is able to stay with a single refrigerant for all areas of the world. According to the company, the similarities between the two refrigerants greatly simplify the changeover process, allowing NU-22 to be used as a drop-in replacement for HCFC-22 in field service work.

**Contact:** www.icorinternational.com

### The difference is in the design

A new oil-free chiller design is increasing efficiency by as much as 20 per cent and is helping to cut refrigerant emissions to practically zero, providing benefits for both the ozone layer and for global warming. The Trane S-Series EarthWise™ CenTraVac chiller uses a direct-drive that eliminates the need for gears, and hence for an oil-based lubrication system, so there is no oil to contaminate the refrigerant. Contamination of refrigerant is a common and significant cause of efficiency loss in traditional CFC chiller designs.



*Environmental experts check out the S-Series Earthwise™ CenTraVac chiller during the Earth Technologies Forum*

Use of the low-pressure refrigerant HCFC-123 is crucial to this design which replaces conventional components with self-healing, ceramic ball bearings. Having no oil lubricating system also means that, except in the case of major mechanical failure, the unit never has to be opened. Combining the new drive system and perfect hermetic sealing lowers energy consumption, increases efficiency and reduces leaks. The design goal for S-Series chillers is for the initial charge of refrigerant to be the final charge, and for this to be recovered at the end of the chiller's life to be used in other chillers or as chemical feedstock.

**Contact:** Eugene Smithart, Director Environmental Affairs, e-mail: gsmithart@trane.com

## HALONS

### Novec 1230 fluid rated 'seaworthy' by IMO

In May 2002, 3M Specialty Materials announced that its 3M™ Novoc™ 1230 fire protection fluid, a halon alternative, had satisfied the requirements of the International Maritime Organization's (IMO) Maritime Safety Committee

Circular 848 test protocol. Successful completion of IMO testing opens up the possibility for administrative and certification agencies to approve commercialization of the fire protection system for marine applications. Novec 1230 is a fluoroketone that has zero ozone-depletion potential and low global warming potential—it is not therefore included in the Kyoto Protocol 'basket' of greenhouse gases.



*Novec 1230 fire protection fluid may soon be used for marine applications*

3M has submitted the necessary registration for premanufacturing notification and US EPA Significant New Alternatives Policy (SNAP) programme clearance and has also submitted registration for the European List of Notified Chemical Substances (ELINCS) clearance from the European Union. The company also proposes customer support for its product which includes take-back and proper disposal of old or overstocked fluid.

**Contact:** John M. Schuster,  
**e-mail:** [jmschuster1@mmm.com](mailto:jmschuster1@mmm.com)

## FOAMS

### **New foams—stronger and more environmentally friendly**

Engineers at the Ohio State University have found a way to make dense plastic foam that may replace solid plastic in the future—and the new foams are blown using CO<sub>2</sub>, so they will not be harmful to the ozone layer. By including 'nanocomposites'—additive particles that are only a few billionths of a metre across—L. James Lee and his colleagues at Ohio State ultimately aim to produce a foam blown with supercritical CO<sub>2</sub> that will be strong enough to replace solid plastic for some structural applications. According to Lee, the

## *SOLARCHILL—an innovative new generation hydrocarbon-based and solar powered vaccine cooler*

SOLARCHILL is a new cooler technology applied to vaccine coolers that contributes to sustainable development. Developed as a cooperative project between Greenpeace International, GTZ Germany, UNICEF, WHO, UNEP DTIE, the Danish Technological Institute and industry, SOLARCHILL is powered by solar-panels and uses the hydrocarbon refrigerant R-600a—it does not, therefore, contribute to ozone depletion or global warming.

The SOLARCHILL vaccine cooler, initiated by WHO and the UNEP DTIE Energy and OzonAction Branch, addresses important health and development concerns: the availability of coolers in developing countries is vital for maintaining the shelf life of vaccines and of some medicines. Many regions of the world are off the electrical grid or have unstable electricity supplies. Under these circumstances, maintaining the vaccine cold chain is crucial for the health of millions of people. SOLARCHILL provides a cost-effective and reliable technology for the storage and transport of vaccines under off-grid conditions.

Primary obstacles to the uptake of solar-powered vaccine cooler technologies in



developing countries are the current state of battery technologies and the relatively high price of units presently on the market. SOLARCHILL replaces lead battery technology by ice-packs and does not

require any electronic control devices. It therefore uses simple and reliable technology that is better suited to conditions in developing countries. In addition, a simple AC/DC converter provides the flexibility to use wind, hydropower, biogas or grid energy. Even a car battery could be used to increase the hold-over time during exceptional cloudy periods.

The field-testing will require further funding and interested donors are invited to contact Mr Janos Mate at Greenpeace International.

**Contact:** Mr Janos Mate, Greenpeace International,  
**e-mail:** [jmate@telus.net](mailto:jmate@telus.net)  
**Halvart Koppen, UNEP DTIE,**  
**e-mail:** [Halvart.Koppen@unep.fr](mailto:Halvart.Koppen@unep.fr)

pressures and temperatures required to obtain supercritical CO<sub>2</sub> are readily attainable with existing industrial equipment and manufacturers would not even have to alter their existing foaming equipment to manufacture the new, ozone-friendly foams.

**Contact:** L. James Lee,  
**e-mail:** [LEELJ@che.eng.ohio-state.edu](mailto:LEELJ@che.eng.ohio-state.edu)

## METHYL BROMIDE

### **'Stinky white fungus' could help save the ozone layer**

A fungus discovered in the rain forests of Central America may provide an environmentally friendly alternative to methyl bromide. *Muscodor albus*, which translates roughly as 'stinky white fungus', has been found to emit gases that kill or slow organisms that are harmful to some crops. It is currently undergoing laboratory tests at AgraQuest Inc., under licence from Montana State University's professor Gary Strobel, who found it

during an expedition in Central America. Using the fungus and related strains, AgraQuest is developing a fumigant that is expected to control bacteria and fungi that cause diseases in plants, as well as microorganisms that cause disease in humans. So far, the fumigant has been tested in the laboratory as a seed treatment and soil amendment, and has also shown the ability to kill nematodes and hatching insects. It appears to have the added advantage of not being toxic to mammals, unlike other alternatives to methyl bromide such as

1,3-dichloropropene and metam sodium. AgraQuest still has some way to go, however, before marketing a product from the fungus. The company first has to conduct field studies to demonstrate the safety and efficacy of the fumigant, and will then have to apply to the federal and state environmental protection agencies for approval to sell the product.

**Contact:** AgraQuest, Inc.,  
**e-mail:** [info@agraquest.com](mailto:info@agraquest.com)


**WORLD POLICY ROUNDUP**
**Japan—call to improve CFC handling and progress on recycling**

Japan's Ministry of Economy, Trade and Industry (METI) recently called on 16 Japanese manufacturers to improve their methods for disposing of CFCs. The call follows the recent discovery that Kansai Recycle Systems Corporation—the company to whom the firms had subcontracted the CFC disposal work—had failed to dispose of the gases correctly and had released ODS into the atmosphere. Under Japanese law, companies are required to ensure that CFCs from discarded air conditioners and refrigerators are recycled. Sharp and Mitsubishi Materials Corporation established Kansai Recycle in an effort to comply with the recycling law. Government officials said the amount of CFC gases released by Kansai Recycle totalled more than one tonne, nearly five times the amount reported by Sharp Corporation earlier this year.

Nevertheless, the recycling law concluded its first year since enforcement in April 2001 with good results in the recovery of CFCs from discarded air conditioners and refrigerators—603 tonnes of CFCs were extracted and destroyed.

In a move to accelerate recycling, the Japanese cabinet approved an additional bill requiring automobile manufacturers and importers to accept used cars returned by owners in order to recycle shredder dust, air bags and CFCs. If enacted, the law would require manufacturers and importers of new vehicles to add a consumer recycling fee to the price of a new car. Vehicle owners would also be expected to contribute 20,000 yen (about US\$150) per car to a recycling fund. The bill would affect an estimated 4 million cars each year.

**Contact: Office for the Promotion of Ozone Layer Protection, Manufacturing Industries Bureau, Ministry of Economy, Trade and Industry, e-mail: qqhbbfc@meti.go.jp**

**Georgia—breakthrough in adoption of ODS import licencing system**

Two years of effort by the Georgia Ozone Unit to persuade the authorities to adopt an ODS import licencing system have been crowned with success. Earlier, the

government wished to avoid needlessly complicating the customs procedures and was thus reluctant to establish a licencing system. The breakthrough came on 8 May this year when—as a result of concerted efforts by Georgia's Ministry of Environment, the Ozone Unit and UNEP DTIE—Georgia's government adopted an ODS import licencing system. Under the licencing scheme, the country plans to substantially accelerate ODS phase-out activities.

**Contact: Mr Michail Tushishvili, e-mail: airdept@caucasus.net**

**US EPA issues direct final rule on methyl bromide exports**

US EPA has issued a direct final rule in the Federal Register extending the availability of limited production rights to manufacture methyl bromide solely for export to developing countries.

A US EPA rule published in 2000 allocated production allowances for the manufacture of methyl bromide for export to developing countries until 1 January 2002. The recently issued direct final rule extends the allowances until 1 January 2005.

**Contact: Tom Land, US EPA, e-mail: land.tom@epa.gov.**

**Kazakhstan gets a halon bank management programme**

UNDP, in cooperation with UNOPS, recently awarded a contract to RemTec International USA, allowing the company to establish a centralized halon recovery, recycling and storage facility in Kazakhstan. The funds for the project are provided by the Global Environment Facility (GEF)

There are two key project segments. First, the establishment of a halon recovery/recycling/storage centre in Almaty which will service all of Kazakhstan. This facility is to be equipped with RemTec's proprietary recycling systems, which will enable it to safely reclaim the region's recovered Halon 1211, 1301 and 2402 in line with local and international environmental standards. Second, RemTec will provide instructional workshops for operators and other equipment training activities.

**Contact: Ms Valentina Kryukova, Climate Change Coordination Centre, e-mail: valentina@climate.kz**

**Uganda bans used refrigerator imports**

Uganda's National Environmental Management Authority (NEMA) has announced plans to ban the importation

and use of second-hand refrigeration equipment. The laws will be phased in to help the country meet its obligations under the Montreal Protocol

NEMA, in collaboration with other government agencies, has also formed the Uganda Refrigeration Association which will be responsible for training owners of refrigerators and cooling systems in recycling the gases contained in the units. Although Uganda has passed legislation to control ODS, some officials fear that used equipment may continue to be imported into the country via poorly monitored routes.

**Contact: Mr Rwothumio Thomiko, ODS Officer, NEMA, e-mail: neic@starcom.co.ug**

**Argentina takes action on methyl bromide**

On 29 April 2002, Argentina's Secretary of Environment and Sustainable Development, together with the Chief of Cabinet of the Secretariat of Agriculture, the President of the Sanitary Institute and other high-level government officials, officially announced that use of methyl bromide for soil fumigation in Argentina is to be phased out by the year 2007.



*Signing of Argentina's methyl bromide phase-out agreement*

Under an agreement between the government of Argentina and the ExCom, two investment projects were approved for phase out of methyl bromide in the production of strawberries, cut flowers and protected vegetables, and tobacco and non-protected vegetable seedbeds.

Argentina's Secretariat of Agriculture, acting through the National Institute of Agro-technology (INTA), is in charge of implementing both projects, together with different cooperative associations from the provinces. They will be coordinated and monitored by the National Ozone Unit (OPROZ).

**Contact: Dr Miguel Angel Craviotto, National Director of Environmental Management Eng., e-mail: Mcraviotto@medioambiente.gov.ar**

## DIALOGUE AND DISCUSSION

### Meetings/Conferences/Workshops

#### India—a voluntary pledge to cut CFC emissions

A bold new initiative, aimed at accelerating the phase out of ODS across India was launched on 2 May 2002 by the Indian Government and UNEP.



*Mr Klaus Töpfer, Executive Director UNEP (second from right); Ms Sushma Chowdry, Addl. Secretary (centre) and Usha Chadrasekhar, Director Ozone Cell (right), from India's Ministry of Forests and Environment with government and industry experts at the signing of India's voluntary pledge*

Under the initiative, India's four big manufacturers of CFCs have pledged to crack down on 'rogue emissions' during production processes by introducing new, cleaner production technologies. Production by the four companies concerned is scheduled to reach zero in 2010, from a peak production figure of 23,659 tonnes at the end of the 1990s.

#### Ethiopia—recovery and recycling project helping to achieve CFC freeze in 2003

An ODS recycling and recovery project, organized with the support of UNEP, should help Ethiopia achieve compliance with the Montreal Protocol phase-out provisions. The country's CFC consumption exceeded its freeze level of 33.8 ODP tonnes in 1999 and 2000 by more than 5 tonnes. It is one of UNEP's priorities to assist the country in achieving compliance.

As a result of Phase I of the national recovery and recycling project, organized on 11–15 March 2002 by the National Meteorological Services Agency and Focal Point Ozone (with UNEP support), 28 local trainers and senior technicians participated in a training workshop, and recycling and recovery equipment (8 recovery and 3 recycling units) was made available to the country. It is expected that when the project is completed, 65–70 technicians will be trained, and that use of the equipment will result in an annual reduction of 7.5 ODP tonnes.

The workshop participants also agreed on a set of recommendations including the ratification of the Montreal Protocol amendments, the establishment of an industry association, the implementation of an import/export licensing system and the adoption of a code of good practice in refrigeration.

This project should allow Ethiopia to return to compliance in 2002. However, in order to achieve 50 per cent reduction in 2005, corresponding to 16.9 ODP tonnes, additional assistance is urgently required as part of the country's RMP update.

**Contact:** Mr Bekrestion Kassahun, NOU, e-mail: [nmsa@telecom.net.et](mailto:nmsa@telecom.net.et)

The companies are also backing a nationwide public awareness scheme that will target the thousands of small and medium sized enterprises that are part of the CFC supply chain. Raising awareness will help prepare companies for the final phase out in eight years time.

**Contact:** Mrs Usha Chadrasekhar, Ministry of Environment and Forests, e-mail: [ozone@del3.vsnl.net.in](mailto:ozone@del3.vsnl.net.in)

#### Arab States of the Gulf coordinate ozone protection actions

In January 2002, a regional seminar on Alternatives to Ozone Depleting Substances in the Cooperative Council for the Arab States of the Gulf (GCC) region concluded its activities by submitting a number of recommendations for consideration at the 16th meeting of the GCC Environmental Coordination Committee. The committee, in turn, made the following recommendations:

- Unified rules and regulations should be established in the GCC countries to regulate the import and handling of ODS.
- The role of the Ozone Work Team in the GCC countries should be activated in close coordination with ODS Network of West Asia.
- The General Secretariat should, in coordination with the GCC countries and the Regional Network

Coordinator, conduct a feasibility study on the use of hydrocarbons and their technologies in the refrigeration and air-conditioning sector in the GCC countries. Guidelines on sound use of such technologies should be provided.

- The Regional Network Coordinator should be asked to provide technical assistance to set up national halon banks. GCC countries should introduce mechanisms to facilitate the transfer of halons among them.

**Contact:** Dr Abdul Elah Al Wadaee, Regional Network Coordinator, e-mail: [awunrowa@unep.org.bh](mailto:awunrowa@unep.org.bh)

#### Southern African Regional Workshop on Lessons Learned and Case Studies in Technology Transfer under the MLF

To draw lessons from technology transfer under completed projects to phase out ODS under the MLF, representatives of enterprises, NGOs, research institutes, government officials from Southern African countries and international experts met on 27–29 May in Blantyre, Malawi.



*Hon. L. Shati, Deputy Minister of Natural Resources and Environmental Affairs, Malawi (left), giving the opening statement at Blantyre*

Recommendations made at the workshop include:

- Promotion of close dialogue with farmers using methyl bromide, to raise their awareness and provide training on alternatives.
- Training of consultants to improve their understanding of local conditions and needs.
- Promotion of technological development based on local and traditional knowledge.

Six case studies resulting from the workshop will be published and presented

at the World Summit for Sustainable Development (WSSD), in September.

**Contact:** Jeremy Bazye, RNC Africa,  
e-mail: [Jeremy.Bazye@unep.org](mailto:Jeremy.Bazye@unep.org)  
Patrick Salifu, Malawi Environmental Affairs  
Department, e-mail: [salifu@yahoo.com](mailto:salifu@yahoo.com)

### SBSTA urges stronger links between UNFCCC and Montreal Protocol

Closer links between efforts to save the ozone layer and those to help fight climate change were urged in a final document from the 16th meeting of the UNFCCC's Subsidiary Body for Scientific and Technological Advice (SBSTA), held in Bonn on 5–14 June.

Recognizing the contribution made by HFCs, hydrocarbons, ammonia, CO<sub>2</sub> and other options to the phase out of ODS, the SBSTA stressed the importance of developing a relevant information package for all stakeholders, with a focus on the relationship between avoiding ozone depletion and minimizing global warming. Noting that the MLF is funding replacement of ODS in some developing countries by alternatives which can include greenhouse gases, the meeting also invited UNFCCC Parties to consider additional funding through the Global Environment Facility (GEF) and the Clean Development Mechanism (CDM). The SBSTA also welcomed information from the Parties on HFCs and PFCs and agreed to recommend a draft decision for consideration at the UNFCCC COP-8, once the IPCC and TEAP had evaluated all aspects that would play a role in the development of an information package and had communicated their replies to the UNFCCC Secretariat.

**Contact:** Leo Meyer, Ministry of Housing, Spatial Planning and the Environment,  
e-mail: [leo.meyer@minvrom.nl](mailto:leo.meyer@minvrom.nl)

### Bulgaria—promoting alternatives to methyl bromide

A workshop organized jointly by UNEP DTIE's OzonAction Programme and Bulgaria's National Agricultural Advisory Service gave representatives from Eastern and Central European countries the opportunity to: obtain information on alternatives to post-harvest uses of methyl bromide; see practical demonstrations of alternatives in use; and initiate a training strategy to promote alternatives. Participants in the workshop, held in Sofia on 28–30 May, heard presentations from technical experts from the region, from UNEP, MBTOC, UNIDO, EU and from the Canadian private sector.

**Contact:** Dr Margarita Nikilova, National Agricultural Advisory Service, e-mail: [marginik@mail.bg](mailto:marginik@mail.bg)

### A Regional Strategy to comply with the Montreal Protocol in Pacific Island Countries

The 36th ExCom Meeting approved a Regional Strategy to comply with the Montreal Protocol in Pacific Island Countries (PIC). The Strategy was developed jointly by UNEP and its partners in the Pacific, including the South Pacific Regional Environment Programme (SPREP), Australia and New Zealand.

Use of ODS in the Pacific region is limited to CFCs, HCFCs and methyl bromide. The most significant threat to the sustainable phase out of CFCs in the region is the importation of second-hand vehicles with CFC air conditioning systems, from Japan and, to a lesser extent, South Korea. In most PIC countries there is a rising (and often unmet) demand to service these units, creating an ongoing risk of illegal imports which is likely to reverse the present phase-out trends.

The objectives of the Strategy are to assist with accelerated and sustained CFC phase out in the region (including a complete CFC phase out in eight of the fourteen PICs by the end of 2005), and to achieve this in the most cost-effective manner. In order to attain its objectives, the Strategy will provide:

- direct support for national actions, to assist with the monitoring of accelerated phase out;
- regional facilitation for policy setting, training and public awareness;
- active collaboration with bilateral donors i.e. Australia, New Zealand and Germany; and
- an overall advisory role for UNEP DTIE via its re-oriented compliance assistance programme monitored through the Regional Office of Asia and the Pacific

**Contact:** Mr Thanabat Junchaya, RNC SEAP,  
e-mail: [junchaya@un.org](mailto:junchaya@un.org)  
Ms I'o Tuakeu-Lindsay, SPREP,  
email: [iotuakeu@sprep.org.ws](mailto:iotuakeu@sprep.org.ws)

## Customs training—strengthening the front line against illegal trade

Illegal trade in ODS is a growing threat to the success of international agreements to fight ozone depletion. The ability of customs officers and others to detect such trade is vital in curtailing it, but officers do not always have adequate training. Efforts are under way to provide that essential training—some of them are described here:

- **February, Niger:** 17 customs administrators received training on ODS at a two-day workshop.
- **February, Trinidad and Tobago:** customs brokers, customs clerks and importers received training in monitoring and controlling of ODS and ODS-dependent technologies.
- **March, Sri Lanka:** ODS related training was provided for 13 customs officers from Colombo's Customs Department and for eight other key stakeholders.
- **March, Belize:** nine customs officers, seven police officers, one Bureau of Standards official and a representative of the Ministry of Finance attended a train-the-trainers workshop.
- **May, Mongolia:** 39 state customs inspectors and customs officers increased their skills in monitoring and controlling imports of ODS and ODS-containing equipment at a Phase II training workshop.

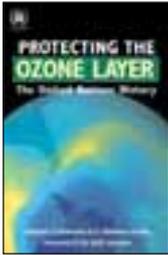


*Training customs officers in the use of refrigerant identifiers on a used vehicle*

### Illegal trade update

- **March 2002,** Donald W. Pigeon of Pompano Beach, Florida, USA, pleaded guilty to illegally importing around 300 cylinders of banned R-12 into the United States. When sentenced, Pigeon faces a maximum sentence of up to five years in prison and/or a fine of up to US\$250,000.
- **March 2002,** four men pleaded guilty to unlawfully importing 1,760 tonnes of CFCs into the USA. Two other individuals pleaded guilty to conspiring to defraud the IRS by means of a scheme to illegally import, and evade taxes on, hundreds of tonnes of highly restricted CFCs. Six other men had already entered guilty pleas as a result of this investigation.

## New publications



**The inside story of the Montreal Protocol**  
*Protecting the Ozone Layer, The United Nations History*, by Stephen O. Andersen and K. Madhava Sarma, tells the remarkable story of the Montreal Protocol

now recognized as a unique example of international cooperation on environmental issues. Mr Andersen and Mr Sarma were initiators of some key aspects of the Protocol, have been active players in others, and have remained involved and committed throughout its development. They are therefore uniquely placed to provide a fascinating insider perspective on the history of science, diplomacy, technology, implementation and compliance, and on the involvement of NGOs and media in the making of this historic agreement. The chapters of the book are interspersed with lively personal perspectives from nearly 60 high-level participants from around the

world and, in a final chapter, the authors draw on their experience to summarize the lessons of the successful global efforts to protect the stratospheric ozone layer.

**Protecting the Ozone layer, The United Nations History**, is available from Earthscan Publishing, 120 Pentonville Road, London N1 9JN, UK, tel: +44 (0) 20 7278 0433, fax: +44 (0) 20 7278 1142  
Website: [www.earthscan.co.uk](http://www.earthscan.co.uk)  
Also available from the UNEP bookshop at [www.earthprint.com](http://www.earthprint.com)



**Ozone Connections: Expert Networks in Global Environmental Governance**

Social scientists Penelope Canan and Nancy Reichman of the University of Denver (Denver, Colorado,

USA), sponsored by the US National Science Foundation, studied the way in which the Montreal Protocol was actually implemented through the creation and support of global

knowledge-sharing networks. Their new book, *Ozone Connections*, is a study of the TEAP and its TOCs.

The authors found that the implementation of the Montreal Protocol was an exemplary case of 'collaborative environmental regulation' where a 'regulatory community,' comprised of governments, regulated entities and third parties, skillfully combined regulatory instruments to encourage and facilitate industry's move beyond compliance. They show that, in response to environmental laws, industrial technology can lead in problem solving, technology diffusion and deep institutional change. It can do this, however, only if it is configured in deeply embedded regulatory communities. The book is intended for anyone seeking to know how to approach global environmental problems in the future.

**To place an order for this title or to view Chapter 1, 'Introduction', online, please visit the Greenleaf website at: [www.greenleaf-publishing.com/catalogue/ozone.htm](http://www.greenleaf-publishing.com/catalogue/ozone.htm)**

## Science news

### Ozone losses may be speeding up at higher latitudes, according to study

New findings by researchers from University of Colorado at Boulder indicate that ozone losses due to breakdown of ODS may be occurring much faster than previously believed in the higher latitudes, and at altitudes between 10 and 15 kilometres above the Earth. This is lower in the atmosphere than previously thought, and could lead to additional ozone losses.

The scientists say that the winter chemical reactions are occurring in an atmospheric region where the air can readily mix with air at mid-latitudes, like the skies over Reno, Denver and Philadelphia.

Researchers have used balloons and aircraft to show that free radicals produced by the breakdown of ODS are more concentrated at high latitudes than previously believed. During winter and spring, the reactions appear to be accelerated from about 50 degrees to 60 degrees in latitude—roughly from Vancouver north to Great Slave Lake in the Northwest Territories—all the way to the North Pole.

**Contacts: Darin Toohey, University of Colorado at Boulder, e-mail: [Darin.Toohy@colorado.edu](mailto:Darin.Toohy@colorado.edu)**

Photo: NASA TOMS

### Eyes in the sky

Satellites from various countries keep watch on the health of our ozone layer. Some of these are described briefly below, with details of where you can find out more.



### OSIRIS—uncovering details of ozone depletion

The Optical Spectrograph and InfraRed Imager System (OSIRIS) has been in space for just over a year. The system is performing very well and is collecting significant data on ozone depletion. OSIRIS was launched as part of a joint astronomy/aeronomy mission led by Sweden and involving Canada, France and Finland. It is providing unique data by producing maps of concentrations of ozone every 1.5 km above the earth (other satellites yield maps of the total amount of ozone above any point). From these profiles, it will be possible to obtain insights into how the ozone depletion is occurring rather than just where over the earth.

**For more information, go to: [www.space.gc.ca/osiris-data](http://www.space.gc.ca/osiris-data)**



### Envisat—Europe's largest satellite

Europe's Envisat—weighing 8 tonnes and the size of an articulated truck—will circle the Earth every 100 minutes for the next five years, gathering data on global changes such as depletion of the ozone layer, ocean levels, the state of polar ice and plankton currents in the world's seas. The information will be relayed to ground stations worldwide for analysis. The satellite will return to the same orbit every 35 days and, after three days, will draw a complete map of the world.

**For more information, go to: [www2.swissinfo.org/sen/Swissinfo.html?siteSec=511&sid=1039474](http://www2.swissinfo.org/sen/Swissinfo.html?siteSec=511&sid=1039474)**



### QuikTOMS (NASA, USA)

NASA launched the QuikTOMS satellite in September 2001, to keep a close eye on the ozone layer. However, a rocket malfunction 83 seconds into the flight sent the spacecraft into a useless orbit, and threw scientists into a panic! They now have to rely on increasingly shaky data from QuikTOMS's ageing predecessor, the 6-year-old TOMS (Total Ozone Mapping Spectrometer) satellite.

**For more information, go to: [www.discover.com/feb\\_02/featsky.html](http://www.discover.com/feb_02/featsky.html)**

## Innovative methods to support MEAs: China Industry Parks

(... continued from page 1)

Benefiting from this flexibility, some of China's SMEs were merged or restructured, and facilities producing alternatives to ODS were set up. However, these enterprises were scattered throughout the country, making it difficult to monitor their production. In addition, some companies had converted to advanced production technology but still had out-of-date management systems, weakening their ability to compete, and threatening their future.



Mr Liu Yi explains the project to Minister Xie and other dignitaries at Liangfan

In order to improve competitiveness and facilitate monitoring, SEPA decided to build an Industry Park for selected companies whose activities contribute to implementation of MEAs—with a focus on the Montreal Protocol at present. Companies contributing to implementation of other MEAs, such as those on Persistent Organic Pollutants and climate change, would follow later. The idea received wide support from industry sectors and—encouraged by this positive response—SEPA began contacting local cities around Beijing in 2000. The Liangfan Economic Development Zone, 80 kilometres east of Beijing, was finally selected as the location for the Industry Park.

### How will the Industry Park help China to implement MEAs?

By providing technical and financial assistance from central and/or local government, the Industry Park will help to develop China's industrial base for the production of alternatives to ODS that are of higher quality, are more competitive in price and are better able to service the market. This will, in turn, help to ensure sustainable implementation of MEAs in China.

### What kind of assistance will the Industry Park provide to industry?

For industry, moving to the Industry Park

means more than just relocation of production facilities. The park will provide a range of services, both 'hard' and 'soft', at every stage of business development, including cheaper land, favourable tax regimes, collective services (heating, energy, premises, storage, security, etc.) and consultancy for business development. Belonging to the park will also improve a company's image.

### What kinds of industry will be allowed to move into the Industry Park in the long term?

The criteria for entry to the park will be stringent. In principle, a company must be engaged in activities relevant to implementation of MEAs and should be a low consumer of energy, water and raw materials. It should also meet national industry discharge standards and be committed to achieving zero emissions by applying the 'eco-chain' principle. Industries selected so far are mainly recipients of grants from the MLF; this will later be extended to projects financed from other sources in the ODS sector.

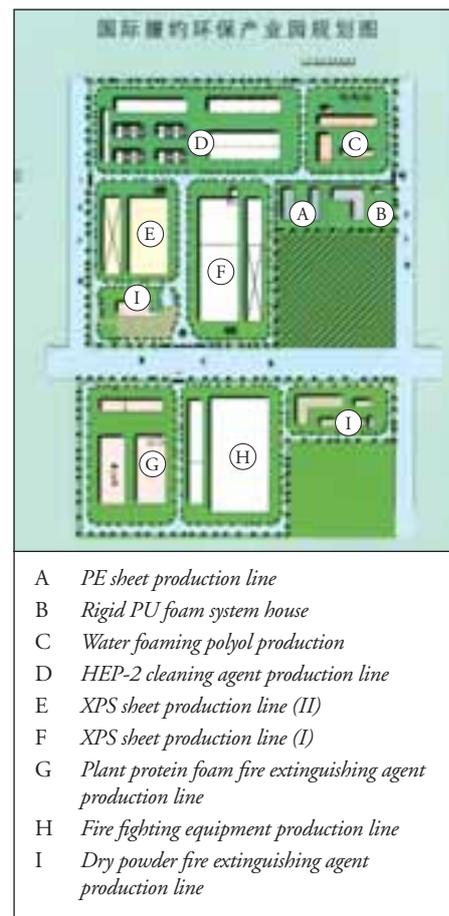
### What is the development plan for the Industry Park?

The Industry Park will be developed in two stages. The first will require 16 hectares of land to accommodate 7 projects. First stage development work has started and is expected to be completed by the end of 2003, at a cost of US\$60 million.

In the second stage, SEPA plans to obtain 50 hectares of land for another 10 projects. Completion of this stage is planned for the end of 2004. Project costs will be met by SEPA and by the industries.

### Which industries will be moving into the Industry Park in the near future?

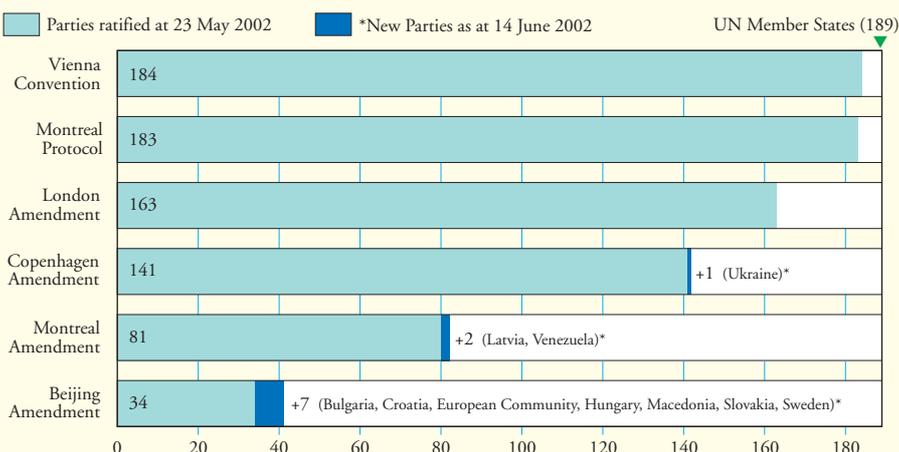
Seventeen projects relevant to



implementation of the Montreal Protocol have been selected for entry to the Industry Park by 2004. Eight of these are in production sectors using alternatives to CFCs (e.g. CFC-free production of polyethylene foam), five in the production of alternative refrigerants, one in foaming agent production, one producing solvents and two manufacturing fire-extinguishing agents. By June 2002, two PE factories had started production in the Industry Park.

Contact: Mr Liu Yi, China SEPA,  
e-mail: nepafeco@public.bta.net.cn

## The progress in ratification of the Montreal Protocol and its amendments (as at 14 June 2002)



## The National Ozone Unit Interview

This is one of a series of articles featuring the views of national ODS officers

### Mr Abderrahim Chakour



**Ozone Officer,  
Morocco**  
e-mail:  
**Abderrahimc@  
mcinet.gov.ma**

*To date, Morocco has successfully implemented a number of investment projects. Can you identify the three main factors that have been most helpful to you?*

The essential factors that have contributed to the success of investment projects in sectors using CFCs were: the adoption of a phase-out strategy, starting with production activities; informing and raising awareness among stakeholders; and commitment to total phase out after 1 January 2005. In 2001, the investment projects made possible a reduction of around 45 per cent in consumption of Annex 1 CFCs in relation to the freeze level.

*Morocco is now in the process of developing its Refrigerant Management Plan (RMP). Can you describe how this will contribute to phase out of CFCs in the refrigeration sector?*

First, I would like to establish that the delay in start up of the RMP is a result of the strategic choice for phase out of CFCs in Morocco which I have already mentioned. The initial aim of the strategy is reconversion of the major investment projects identified as being large ODS consumers, so that SMEs will be covered by an RMP. Preparation of the plan, in collaboration with UNEP, will help to establish the amounts of CFCs used by SMEs in the refrigeration sector, with a view to proposing solutions for their phase out.

*Can you describe Morocco's compliance situation with regard to CFCs, halons and methyl bromide?*

Given that the freeze baseline for methyl bromide begins this year, this controlled substance will be subject to import licencing very soon, to better manage and monitor its consumption. Halons, have been subject to licencing since 1998. A study of quantities of halon stocks was carried out and a workshop for presentation and discussion of the study results was organized in June.

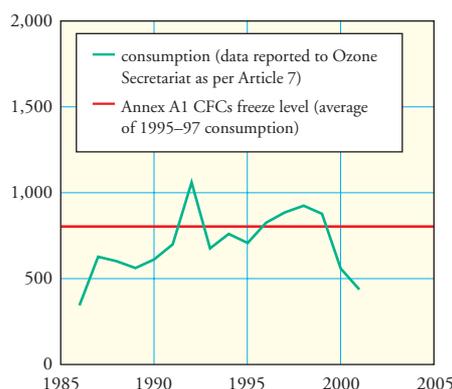
*Morocco recently completed two methyl bromide alternatives demonstration projects. How is it ensuring that the results are widely disseminated and will eventually be adapted by the methyl bromide users?*

At present, there are two investment projects in progress and a third is being prepared. National monitoring committees, including representatives of producers and relevant organizations, have been set up for each investment project. The committees plan the annual activities and ensure follow-up and implementation. Activities completed or in progress include: a database of users and conditions of use of methyl bromide for each project; organization, in May, of a day to raise awareness and communicate the results of the databases to farmers and technicians involved in strawberry growing; choice of farmers for application of alternatives; and application and monitoring of alternatives on farms during the 2002–2003 growing period.

*Can you describe the main features of Morocco's ODS import licencing system and how it assists you in monitoring the movement of ODS into the country?*

Morocco introduced import licences for ODS and equipment using ODS in November 1998. Importing domestic refrigerators and freezers that used controlled substances was banned, as conversion was completed for the entire domestic refrigeration sector. The licencing system makes it possible to monitor imports so as not to exceed Morocco's planned consumption of ODS. In addition to licencing, we are also training and equipping customs officers to detect ODS covered by the RMP. This should reinforce control of ODS imports.

Trend in CFC consumption in Morocco



## Forthcoming meetings

UNEP Environmental Effects Assessment Panel Meeting, 14–21 September 2002, Salt Lake City, Utah, USA

Methyl Bromide Alternatives and Emissions Conference, 6–9 November 2002, Orlando, Florida, USA

29th Implementation Committee Meeting under the Non-compliance Procedure, 23 November 2002 (tentative), Rome, Italy

Third Meeting of the Bureau of the 5th Meeting of the Conference of the Parties to the Vienna Convention, 25 November 2002 (tentative), Rome, Italy

2nd Meeting of the Bureau of the 13th Meeting of the Parties to the Montreal Protocol, 25 November 2002 (tentative), Rome, Italy

6th Meeting of the Parties to the Vienna Convention and the 14th Meeting of the Parties to the Montreal Protocol, 25–29 November 2002, Rome, Italy

The newsletter is available online at:  
**www.uneptie.org/ozonaction**



**OzonAction**, a tri-annual publication, is available in Arabic, Chinese, English, French and Spanish.

The contents of this newsletter are provided for information and do not necessarily represent the policy of UNEP.

ISSN 1020–1602

**Review Board:** Mrs J. Aloisi de Larderel, Dr S. Andersen, Dr N. Campbell, Dr S. Carvalho, Dr O. El-Arini, Mr M. Graber, Mr P. Horwitz, Mrs I. Kökeritz, Dr L. Kuijpers, Mr G. Nardini, Mr D. Omotosho, Mr M. González, Mr R. Shende, Mr D. Stirpe, Mr Liu Yi

**Editor:** Geoffrey Bird

**Publication Manager:** Mr Jim Curlin

**Editorial Assistants:** Mr Andrew Robinson, Ms Cecilia Mercado

Please send comments and material for publication to Mr Rajendra Shende, Head, Energy and OzonAction Branch, at the address below.

United Nations Environment Programme  
Division of Technology, Industry and Economics  
(UNEP DTIE)

OzonAction Programme  
Tour Mirabeau 39–43, Quai André Citroën,  
75739 Paris, Cedex 15, France

Tel: +33 1 44 37 14 50 Fax: +33 1 44 37 14 74  
E-mail: ozonaction@unep.fr

This publication is printed on recycled paper which is bleached without any damage to the environment. Design and production by Words and Publications, Oxford, UK, [www.words.co.uk](http://www.words.co.uk)