



## View point

### Vienna plus ten



*His Excellency Sam K. Ogeri, Kenya, Chairman, Multilateral Fund Executive Committee (ExCom)*

I believe that the year 1996 is going to be a litmus test for whether the commitments made under the Montreal Protocol will hold or not. Last year a review of the Financial Mechanism pointed out that the transfer of

finance and technology to the shop floor had still to take place, and that there was a danger that non-Article 5 countries could become complacent because their phase out was proceeding faster than anticipated. Yet there is an urgent need for adequate funds to strengthen and expand increasing numbers of awareness and training programmes in countries that consume low volumes of ozone-depleting substances (ODS). Will these countries receive the finance they need?

The 7th Meeting of the Parties approved new controls on HCFCs and methyl bromide. The investments made in switching from CFC to HCFCs were considered to have been economically imprudent. We should now give technology sufficient time to evolve and to

provide a pay-back, especially since many enterprises will have to use domestic finance to switch from CFCs to HCFCs or from HCFCs to non-ODS alternatives.

There is a need to assess whether the Fund can now support the expected avalanche of new requests for funding to meet the accelerated phase-out schedules, including demonstration trials of alternatives to methyl bromide. Furthermore, the Executive Committee (ExCom) has, because of the large number of projects submitted, been forced to apply project approval criteria. It is to be hoped that these will not slow down the efforts of countries to phase out ODS.

There is, however, one thing that pleases me: government and industry are jointly implementing an accelerated phase out with remarkable success. And, during 1995, the least developed countries were doing substantial technological trade with newly industrialized developing countries. As the burden on the Fund increases, so will the need for south-south cooperation. However, it is noteworthy that the Protocol will continue to allow latitude in the unmonitored trade within Article 5 countries. It will be unfortunate if the same Article 5 countries use this privilege to allow the transfer of obsolete technology or to increase unnecessary production of controlled substances.

We are now faced with a number of ethical choices. It is important that the decisions about to be made reflect the spirit of the Montreal Protocol.

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## TIME IS UP: CFC production now banned in developed countries

### Parties agree on dates for MeBr and HCFC phase out

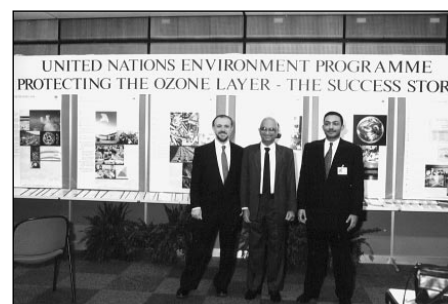
The 7th Meeting of the Parties to the Montreal Protocol took place in Vienna during 5-7 December 1995. It marked the 10th anniversary of the Vienna Convention on Protection of the Ozone Layer. The meeting reached a number of decisions about the future of ODS controls. The most significant was that industrialized countries—which account for about 80 per cent of worldwide use of methyl

bromide—will phase out the consumption and production of methyl bromide by the year 2010. They had earlier agreed only to a freeze by 1995.

The agreed interim control steps are for a 25 per cent reduction by 2001 and a 50 per cent reduction by 2005.

Exemptions will be permitted for certain

... continued on page 5



## News from international agencies

**Fund Secretariat**

The Secretariat organized the 18th ExCom Meeting and that of its Sub-

Committee on Project Review in Vienna, Austria, during 20–24 November 1995. For these meetings it reviewed six country programmes and 158 projects and activities worth US\$84 million. It also reviewed progress reports, work programmes and the detailed 1996 business plans of the implementing agencies. The Secretariat also prepared the draft reports requested from the ExCom by the 11th and 12th Open-Ended Working Group Meetings and by the 6th Meeting of the Parties; guidelines for halon banking; monitoring and evaluation; a report on implementation of country programmes; and the report of the expert group on production of substitutes. It reviewed policy papers on strategies for phase out in countries consuming low volumes (LVCs) of ODS and halons, and for small and medium-sized enterprises (SMEs).

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**UNEP Ozone Secretariat**

The Ozone Secretariat participated in the meeting of the Environmental

Effects Assessment Panel (see page 7) and the CFC/Halons Alternatives Conference (see page 9). The Secretariat serviced the following meetings: the 12th Meeting of the Implementation Committee under the Non-Compliance Procedure of the Montreal Protocol, Vienna, 27 November 1995; the second meeting of the Bureau of the 6th Meeting of the Parties to the Montreal Protocol, Vienna, 4 December 1995; Preparatory Meeting and the 7th Meeting of the Parties to the Montreal Protocol (see page 1). The Secretariat also participated in the workshop to mark the tenth anniversary of the Vienna Convention organized by the Government of Austria on 4 December 1995.

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**UNEP IE**

The OzonAction Programme organized three Regional Workshops on methyl

bromide for English-speaking Africa in Harare, Zimbabwe; Southeast Asia and the Pacific Region in Bangkok, Thailand; and Latin America and the Caribbean in Bogota, Colombia (see page 6). Training workshops on Good Practices in Refrigeration were also conducted in Côte d'Ivoire and Senegal (see page 5). Follow-up meetings of the ODS officers networks were held in the Dominican Republic and Egypt (see page 7). At the 18th ExCom meeting, country programmes and their corresponding institutional-strengthening projects were approved for Benin, Bolivia, Central African Republic, Guinea and Namibia. UNEP prepared policy papers on innovative approaches to ODS phase out in LVCs and, with UNDP, on SMEs.

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E-mail: ozonaction@unep.fr

**UNDP**

At the 18th ExCom meeting in November 1995,

UNDP reported that from its approved budget of US\$95 million it had disbursed US\$30.5 million by the end of September 1995, completing 103 activities. During the first half of November 1995, UNDP commissioned an additional 9 investment projects in China (1), Egypt (4), Malaysia (3) and Mexico (1). This brings the total of completed UNDP investment projects to 29, with the elimination of 1722 tonnes of ODP.

UNDP received approval at the 18th ExCom meeting for US\$15.15 million covering 76 new activities. As a result, UNDP will start operations in Bolivia, Central African Republic, Congo and the Dominican Republic, this bringing to 41 the number of countries in which UNDP has ozone-related activities. UNDP circulated its interim methyl bromide data survey report to the Preparatory Meeting of the Parties held during 28 November to 1 December in Vienna.

Contact: Mr Frank Pinto, UNDP, 1 United Nations Plaza, New York, NY 10017, United States  
Tel: (1) 212 906 5042 Fax: (1) 212 906 6947  
E-mail: frank.pinto@undp.org

**UNIDO**

The conversion of three plants was completed in September and October

1995 in Iran and Argentina. At one plant in Argentina, 214 tonnes of CFCs were phased out by conversion to n-butane technology; trial operations of a converted production line have been begun at another plant. Two prototypes have been tested in Germany in a programme in which the technical staff of five Iranian companies participated; the programme included a practical laboratory course of research and design of new refrigeration technology for phasing out ODS. A training workshop on compressor conversion has also been held in China.

At the 18th ExCom Meeting, 34 projects were approved for execution by UNIDO. In addition, funds were approved for project preparation in Argentina, Brazil, China, India, Macedonia, Malaysia, Mexico, the Philippines, Romania, Senegal and Syria.

Contact: Mrs A. Tcheknavorian, UNIDO, PO Box 300, A-1400 Vienna, Austria  
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E-mail: not available

**World Bank**

In early December 1995, Mr Andrew Steer, director of the World Bank's Environment Department,

addressed the 7th Meeting of the Parties to the Vienna Convention. He reflected on the lessons the Bank had learned regarding cost-effectiveness, building in-country capacity, simplifying procedures and building effective partnerships, and on the results of increasingly successful phase-out operations. Mr Steer also urged the Parties to support the Government of Russia and the Bank in their effort to phase out ODS, and to replenish the Fund to a level that will capitalize on the capacity of Article 5 countries to meet their Montreal Protocol obligations.

Contact: Mr Ken Newcombe, World Bank, 1818 H. Street, N.W. Washington D.C. 20433, United States  
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E-mail: knewcombe@worldbank.org

## Industry and technology updates

### AEROSOLS

#### CFC-free inhalers for UK market

In the United Kingdom 3M Health Care has announced its first CFC-free metered dose inhaler (MDI). The aerosol product dispenses salbutamol—the most commonly prescribed medication for sufferers from asthma—suspended in the propellant HFC-134a. MDIs provide essential relief for millions of asthma sufferers.



The new Airomir™ inhaler has been through toxicological tests of HFC-134a. Some 500 million inhalers are in use worldwide, 3M says, and the company predicts the figure could rise to 800 million by 2000. 3M believes the new product could be potentially safer than the CFC product it replaces because the older product was never required to undergo the exhaustive testing required of the new product.

Contact: 3M Health Care, fax (44) 1509 613326

#### New German inhaler

The German company Hoechst AG claims to have developed an environmentally-safe propellant to treat patients suffering from respiratory illnesses. The new product is called HFA 227 Pharma and is intended to replace CFCs currently used in MDIs.

Some 1000 tonnes of the chemical will be produced annually at Hoechst's factory in Tarragona, Spain, and will then be purified in Germany. According to Hoechst, the European Committee for Proprietary Medicinal Products has ruled that the chemical is suitable for MDIs.

HFA-227 is more commonly known as HFC-227ea or heptafluoropropane.

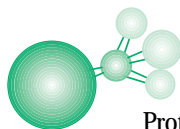
Contact: Hoechst, fax: (49) 69 331 507

### FIRE FIGHTING

#### Inert gas system replaces halons

As a result of collaborative research with industrial and commercial concerns, the US Navy has developed a gas-generator fire-extinguishing system which will be introduced into some of the Navy's aircraft later this year. The system will replace those now using halon-1301. The principle of the new system is similar to that of the vehicle airbag system used to protect car passengers. In this case, however, the impact of a crash activates a series of devices that produce large quantities of inert gases that smother any fire that results from the crash.

Contact: US Navy CFC & Halon Clearinghouse, fax: (1) 703 769 1885



#### US EPA approval for Triodide™

The US Environmental Protection Agency (US EPA) under the Significant New Alternatives Policy (SNAP) Program has classified Triodide™ as acceptable for total flooding applications in unoccupied areas and streaming in non-residential uses. The announcement was made first in the *Federal Register* and more recently in *Notice of Proposed Rule Making* issued on 2 October 1995 (see also OAN 13, January 1995).

Contact: Pacific Scientific, fax: (1) 818 359 7013

#### New phase-out case studies available

*Agricultural Production without Methyl Bromide—four case studies*, CSIRO Division of Entomology. Alternatives for cut flowers, strawberries, cucurbit and tomato production.

Contact: UNEP IE, fax: (33) 1 33 37 14 74

*Dry Cleaning without CFC: Nordic summary report*. Hydrocarbon dry cleaning and wet cleaning alternatives for textiles, leather and furs.

Contact: Nordic Council of Ministers, fax: (45) 33 96 02 02

*Moving to Alternative Refrigerants Update*. Commercial refrigeration retrofit information for SMEs.

Contact: US EPA, fax: (1) 202 233 9731

UNEP IE welcomes information from industry and will mention as many new technologies and products as possible in this newsletter

### FOAMS

#### Chinese use natural substitutes for styrofoam

A biodegradable substitute for the styrofoam used, for example, in fast food containers has been developed in Wuhan, the capital city of China's Hubei Province. The new material is made from straw and grass, and solves two problems simultaneously: it does not have to be blown with ODS; and it degrades naturally, thus avoiding the 'white pollution' commonly found round rubbish tips. The Chinese production line, expected to go into operation shortly, will be able to produce 80 000 fast food containers a day.

Contact: Chinese National Environmental Protection Agency, fax: (86) 1 832 8013

#### US Navy supports tests of new foam

The US Navy is supporting tests of a new water-blown foam to determine product acceptability for large-scale use in naval protection voids (the pockets in ships' hulls that provide protection against explosive devices), according to a report in *CFC/Halon News* (September 1995). The foam has met military specifications in small-scale tests, but no shipbuilding experience or large-scale data exist, hence the need for the tests. The purpose of the foam is to provide ships with some protection against the shock of an exploding mine or torpedo.

Contact: US Navy CFC & Halon Clearinghouse, fax: (1) 703 769 1885

### REFRIGERANTS

#### Japanese use air as refrigerant

The Japanese trading company Kanematsu has announced that it plans to market commercial refrigerators and freezers using air as a refrigerant. The system has been developed by a consortium of Japanese firms and is awaiting patents. Kanematsu believes the system should sell well in North America and Europe; the firm hopes that sales for 'wall-in' units will reach Y10 billion (US\$100 million) within five years. The

# Happy New Year

to all OzonAction *News* readers  
from the UNEP IE  
OzonAction Programme

firm will also work with Kajima Corporation on marketing air conditioning systems using the same technology.

Scientists at the Institute of Environmental and Energy Technology (TNO) in the Netherlands are also developing a system that uses air as the refrigerant. The research is part of the European Union's JOULE II programme. TNO claims that the recent development of a regenerative heat exchanger has made the concept a practical proposition and tests at TNO's new Air Cycle Pilot Plant in Apeldoorn have shown that excellent results can be obtained with the open air cycle, without the familiar problems of moisture ingress and subsequent icing.

Contact: TNO, tel: (31) 15 69 69 69

## New CFC-free Danish refrigerator

Vestfrost, a Danish refrigeration manufacturer, is manufacturing a refrigerator and freezer that do not use CFCs for either insulation or coolant. The refrigerator uses R-134a as its refrigerant, and foam insulation blown with cyclopentane.

The freezer has a 0.21 cubic metre capacity and uses about 0.5 kWh a day (at 32 °C ambient temperature). Internal storage volume is approximately 0.34 cubic metres. The refrigerator uses only 0.88 kWh/day (at 24 °C ambient temperature).

Contact: Vestfrost, fax: (45) 79 14 23 55

## Chinese refrigerator joint ventures

The Changsha Zhongyi Electrical Appliances company in China expects to start trial production of ozone-friendly refrigerators in the second half of 1996, using technology developed by Sweden's AB Electrolux, following a joint production agreement with Electrolux. The US Raytheon Company has also signed a US\$130 million agreement with the Chinese firm Meran for the manufacture of ozone-friendly refrigerators.

Contact: Electrolux, fax: (46) 8 656 4478;  
Raytheon, fax: (1) 617 860 2172

## CFC-free refrigerator plant for India

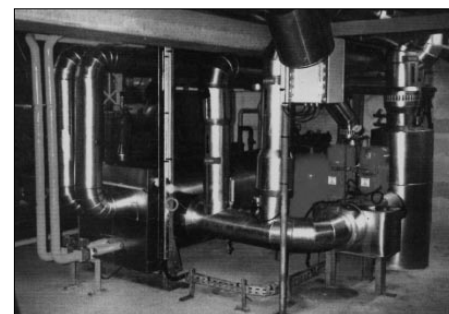
Whirlpool Corporation plans to build a factory in India to manufacture CFC-free

refrigerators. Construction is expected to begin in early 1996, with production scheduled for the second half of 1997. The plant will be capable of producing 1.5 million units annually. A spokesman from Whirlpool told *OzonAction News* that, unless there were major changes in technology in the next 18 months, the refrigerant used would be HFC-134a and the insulation foams would be blown with HCFC-141b.

Contact: Whirlpool, fax: (1) 616 923 3785

## French system reduces need for ODS

A French firm has developed a new refrigeration process that reduces the amount of refrigerant gas used by 70 to 90 per cent. It can use HCFCs, HFCs or ammonia as its primary refrigerant. The



*Dynamic Monotube installed in a large supermarket in France.*

new process, called Dynamic Monotube by its developer, MC International, based in Vélizy, France, consists of two entirely separate coolant systems, and is designed for commercial use by meat and food processors, bakeries, food service companies, supermarkets and restaurants. A primary circuit, situated entirely outside areas open to the public, is used to cool a non-toxic liquid refrigerant (such as water) in the secondary circuit which passes through the refrigerated cabinets.

Contact: MC International, fax: (33) 1 39 46 54 49

## METHYL BROMIDE

### Using heat and inert gases to replace methyl bromide

A new approach to eliminating insect pests, based on the Thermo Lignum technology, is being investigated as a possible substitute for methyl bromide. Thermo Lignum is a patented means of destroying pests which involves two technologies: using either controlled humidity and a temperature of 52 °C, or

## Uruguay phases out CFC-11 in foam industry

In early 1995, the Uruguay Government Technical Ozone Commission (COGO) and the Ministry of Housing, Territorial Regulation and Environment invited bidders to quote on 15 machines for the spray and injection of rigid polyurethane foam as a part of the Conversion to CFC-Free Technology in the Manufacture of Rigid Polyurethane Foam project. The objective was to phase out the use of 70.8 tonnes/year of CFC-11 in the production of rigid



polyurethane foams in the country. The implementing agency was the World Bank and the project was approved for funding in July 1994.

The selected CFC-free system uses water and HCFC-141b and requires foam-dispensing units with variable gear ratios, as well as high-pressure mixing capabilities. Gusmer Latino America, South American distributor for Gusmer, was awarded the contract for the machines. The capital cost of replacing spray foam equipment in seven companies will be financed by the project under a grant from the Multilateral Fund of the Montreal Protocol. It will also pay incremental costs, as the price of HCFC-141b is higher than the price of CFC-11.

Contact: World Bank, fax: (1) 202 522 3256

UNEP IE is updating a compendium of technical case studies on how to eliminate the use of ozone-depleting substances. Governments and industries which have case studies to contribute are asked to contact UNEP IE.

a lower temperature and the gases nitrogen and carbon dioxide, in a sealed chamber. The technologies have traditionally been used to eradicate pests from valuable objects such as fine art and rare books.

From mid-1996, a new technology will be available through which whole rooms and entire buildings can be treated *in situ*.



*The sealed chamber uses lower temperatures and inert gases to eradicate pests.*

This will open the way to a much wider use of the technology. Furthermore, a test programme on using the technique to eliminate pests in food commodities, in particular cocoa beans, has already been

started. There is also interest in developing the technique for all industries in which methyl bromide is still widely used.

Contact: Thermo Lignum UK Ltd  
fax: (44) 181 964 2969

### **Methyl iodide as an alternative**

Researchers in the United States are investigating promising alternatives to methyl bromide, according to a recent report in the *International Environment Reporter* (1 November 1995). Researchers at the Universities of California and Florida are studying methyl iodide—said to be easier to handle than methyl bromide—as a soil fumigant. The US EPA is carrying out toxicological studies of the substance. A process that combines small amounts of phosphine and hot carbon dioxide is also being studied as an alternative grain and mill fumigant.

Contact: US EPA, fax: (1) 202 233 9665

## **SOLVENTS**

### **New vacuum drying patent**

The US firm Hyperflow has patented a vacuum drying method for the electronics industry for use with aqueous cleaning systems that substitute for CFC-based solvents. The method can be used to dry elaborate, sophisticated or simple parts, removing all moisture at the molecular level. According to Hyperflow, the cleaning process is an 'environmentally safe, inexpensive and reliable solution to the precision processing industry'. Aqueous cleaning systems are now widely used by the electronics, defence, aerospace and health care industries.

Contact: Hyperflow, tel: (1) 602 497 1800

An updated and expanded version of the OzonAction Information Clearinghouse database reference tool (OAIC-DV version 3) is now available on diskette from UNEP IE

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quarantine and pre-shipment applications and critical agricultural uses.

Developing countries, which were not previously subject to any controls, have agreed to freeze methyl bromide production by 2002 at average 1995–98 levels. This will be reviewed in 1997.

New controls will also be introduced on hydrochlorofluorocarbons (HCFCs). Until now, industrialized countries were committed to a phase out by the year 2030. Their new schedule is for a phase out by the year 2020 with a 'service tail' until 2030 permitting them to supply existing equipment with HCFCs up to a ceiling of 0.5 per cent of 1989 ODP (HCFC plus CFC) consumption. The cap on consumption until the year 2020 has been reduced by about 10 per cent. Developing countries agreed to a freeze starting in the year 2016 (on the basis of consumption levels in 2015) and to a phase out by 2040.

The meeting also tackled a number of important financial issues, identifying a total of 21 actions that could be taken to improve the Financial Mechanism. ExCom was asked to prepare a three-year rolling plan for presentation at the next Meeting of the Parties (November 1996). The Technology and Economic Assessment Panel was asked to prepare a report, after consultation with the ExCom, on the level of Fund replenishment needed for the period 1997–99. The meeting stressed that sufficient funds should be made available for countries that consume small volumes of ODS to strengthen their awareness and training programmes, support workshops on regulatory and legislative issues, finance retrofitting projects and provide regional customs training.

Another important issue tackled in Vienna was the problem of possible non-compliance with treaty obligations by countries with economies in transition. Belarus, Bulgaria, Poland, Russia and Ukraine have acknowledged that they may miss their agreed phase-out targets.



*Thirty-one selected trainers were trained in improved maintenance at a workshop on Good Practices in Refrigeration held in Abidjan, Côte d'Ivoire (8–13 October 1995). Funded by the Multilateral Fund, it was the first workshop of its kind in French-speaking West Africa. It was organized by UNEP with the International Institute of Refrigeration.*

Contact: UNEP IE,  
fax: (33) 1 44 37 14 74

## News from NGOs



The Zer-O-Zone campaign, run by Canada's Sierra Club-Agassiz Group,

has distributed more than 7000 ozone kits to inform Canadians about the dangers of damaging the ozone layer and what they can personally do to reduce ozone damage. The kit includes an information pamphlet, 'recycle me' stickers to place on the doors of air conditioners, refrigerators and freezers, and a pledge card on which families and individuals can register their commitment to prevent the release of

ODS from their domestic appliances. Zer-O-Zone is funded by Environment Canada, the Winnipeg Foundation and the Agassiz Group of the Sierra Club. It is designed to:

- prevent the emission of ODS into the atmosphere;
- encourage public awareness and support for provincial ozone protection regulations;
- foster environmental citizenship at the individual and community level.

Contact: Zer-O-Zone, fax: (1) 204 984 5951

## World Wide Web sites for ozone news

### US EPA

- *Home Page:* <http://www.epa.gov/docs/ozone/index.html>
- *Regulations:* <http://www.epa.gov/docs/ozone/tutle6/usregs.html>
- *Science:* <http://www.epa.gov/docs/ozone/science/science.html>
- *Methyl bromide:* <http://www.epa.gov/docs/ozone/mbr/mbrqa.html>

Contact: US EPA, fax: (1) 202 233 9665

### US Department of Defense

- *ODS Specification database:* <http://assets-www.idss.ida.org>

Contact: US Navy CFC & Halon Clearinghouse, fax: (1) 703 769 1885

### US Navy

- *Home Page:* <http://home.navisoft.com/navyozone>

Contact: US Navy CFC & Halon Clearinghouse, fax: (1) 703 769 1885

## Highlights from the 18th ExCom

The Executive Committee (ExCom) of the Multilateral Fund met for the 18th time during 22–24 November 1995 in Vienna, Austria. Highlights of the meeting included:

- funding of 95 projects carried over from the 17th Meeting, which will phase out 5100 tonnes of ODS;
- approval of 139 projects which will phase out 5400 tonnes of ODS at a cost to the Fund of US\$45 million;
- a total of US\$74.8 million was allocated to projects, leaving projects worth US\$24.5 million to be carried over to the next ExCom;
- beginning in 1997, all new approved projects will be funded in accordance with agencies' business plans;
- a model for preparing business plans based on the 1996 business plans of the implementing agencies approved at the meeting was adopted and UNEP was requested to follow the same budget cycle as other implementing agencies;
- approval of a two-year time frame for calculating operating costs for rigid polyurethane foam projects;
- adoption of interim guidelines for halon banking and for monitoring and evaluation of projects, and intersessional consideration of bilateral cooperation demonstration projects;
- approval at the next meeting of two demonstration projects per region for low halon-consuming countries;
- further instructions were given for the work of the Expert Group on Production of Substitutes;
- the Secretariat is to undertake further work on guidelines for recovery and recycling, although this should not delay the development of small-scale demonstration projects;
- UNEP is to revise the document on ODS phase out in LVCs and UNEP and UNDP the document on SMEs.

Contact: Multilateral Fund Secretariat, fax: (1) 514 282 0068

### *Methyl bromide workshops*

Regional workshops on methyl bromide have been organized by UNEP IE in Harare for English-speaking Africa, in Bangkok for Southeast Asia and the Pacific, and in Colombia for Latin America and the Caribbean, as part of a larger UNEP/UNDP project.

#### **Africa, 25–26 September 1995**

Organized in cooperation with the Ministry of the Environment and Tourism of Zimbabwe, the main objectives of the workshop were to provide information on methyl bromide alternatives for specific applications, and discuss the implications of control measures. The participants, from 12 developing countries, recognized that methyl bromide use can be reduced through containment, recovery and recycling, and that alternatives can be used for specific applications. Several demonstration projects were identified, and case studies from other countries were requested.

#### **Southeast Asia and the Pacific, 31 October–2 November 1995**

More than 40 participants from 6 countries in the region participated and experts from the United States, New Zealand, the United Kingdom and South Africa gave papers on specific applications of methyl bromide, and available alternatives. The workshop made recommendations on action plans to reduce the use of methyl bromide, strategies for cooperation between government and industry, and identified pilot projects for the region. A main recommendation was to extend the scope of the regional survey on methyl bromide now in progress.

#### **Latin America and the Caribbean, 31 October–2 November 1995**

The workshop, attended by 67 participants from 19 of the region's countries, made specific recommendations about proposed demonstration projects, ways of making more information available on methyl bromide issues and national action plans that would lead first to a more effective use of methyl bromide and eventually to its phase out.

Detailed reports are available from UNEP IE OzonAction Programme, fax: (33) 1 44 37 14 74

## Questions and answers: methylene chloride

**Question:** *I am using methylene chloride as a paint stripper. To what extent is this substance controlled under the Montreal Protocol?*

**Answer:** Methylene chloride, like the chlorinated solvents trichloroethylene and perchloroethylene, are not ODS. Chlorinated solvents which are ODS include methyl chloroform (1,1,1-trichloroethane), carbon tetrachloride, trichlorotrifluoroethane (CFC-113) and HCFCs.

**Question:** *Is there any problem, then, in using methylene chloride?*

**Answer:** Yes. Methylene chloride metabolizes in the body to form carbon monoxide and, therefore, can reduce the blood's ability to carry oxygen. The chemical is listed as a toxic air contaminant under the US Clean Air Act of 1990. In the United States, it is a substance that must be reported under the Toxics Release Inventory of the 1990

Superfund Amendment and Reauthorization Act. And it is a suspected carcinogen. For these reasons, the permissible human exposure limit has recently been lowered in the United States from an eight-hour time-weighted average of 500 ppm to 25 ppm. However, a new study financed by producers of the chemical suggests that methylene chloride may not be a cancer hazard. Producers now recommend a maximum eight-hour time-weighted average exposure of 50 ppm. Although they do not believe methylene chloride is a carcinogen, producers caution users to limit exposure for other reasons.

**Question:** *Why is the substance still used if it is dangerous to humans?*

**Answer:** Methylene chloride is an almost perfect paint stripper. It works well on wood and metal, and it works fast. About 40 per cent of the 16 000 tonnes of methylene chloride sold in the United

States in 1994 went to paint stripping—the chemical's largest single use—followed by metal cleaning, plastics and pharmaceutical manufacture.

**Question:** *Are there any good alternatives for methylene chloride as a paint stripper?*

There are a number of alternatives. The US Navy and Air Force have evaluated alternatives such as blasting with dry ice, cornstarch pellets and water. Other technologies under investigation include the use of enzymes to rub off a paint top coat and blasting with broken walnut shells. There are many chemical alternatives, such as dimethyl esters and N-methyl-2-pyrrolidone, though none is considered as effective as methylene chloride as a paint stripper.

Source: Chemical and Engineering News, 25 September 1995

UNEP can help answer technical questions such as these. Send your questions to: UNEP IE OzonAction Programme, fax: (33) 1 44 37 14 74

## Environment Effects Panel meets in China

The UNEP Environmental Effects Panel met in Beijing, China, during 15–20 October 1995, when it reviewed the latest scientific developments on the environmental effects of ozone depletion.

Among the subjects discussed were the new international ultraviolet index that has been agreed for advising the public about ultraviolet radiation levels, new studies of the incidence of cataract which appear to show differences in response between males and females, the effects of UV-B on lower plants such as mosses and lichens, and the recent finding that the cyanobacteria that supply nitrogen to rice plants in paddy fields are sensitive to UV-B levels.

The Panel reviewed new data on the damage caused by UV-B to materials such as styrene, polypropylene and polystyrene. A new study has also shown that higher levels of tropospheric ultraviolet radiation will lead to increased production of sulphate aerosols which will in turn affect the geographical distribution and optical properties of clouds, thus producing yet another link between ozone depletion and climate change.

Contact: UNEP Ozone Secretariat  
fax: (254) 2 521 930

## Network news

### Africa

*First Workshop of UNEP's ODS Officers Network for French-speaking Africa, Dakar, Senegal, 18-21 September, 1995*

The first workshop of ODS Officers in French-speaking Africa was attended by 12 member countries, and representatives from the Ozone Secretariat, UNDP, UNIDO and UNESCO. Specific outcomes included:

- a consensus that ODS data reporting should be a priority;
- training of customs officials was identified as a critical need for effective monitoring of imports;
- a request for more information in French;
- France and Switzerland expressed their willingness to offer bilateral assistance.

### Latin America

*Workshop for UNEP's ODS Officers Network for Central Latin America, Santo Domingo, Dominican Republic, 6–10 November 1995*

The workshop was held back-to-back with the US EPA/ UNDP workshop on strategies to phase out CFCs in the vehicle air conditioning sector. Participating countries in the network workshop included Belize, Costa Rica, Cuba, El Salvador, Guatemala, Honduras,

Nicaragua, Panama, Dominican Republic, Canada and the United States. Representatives from Chile, Uruguay and Venezuela, as well as UNDP, UNIDO and the Multilateral Fund also attended.

The primary focus of the workshop was refrigeration, with a secondary focus on ODS monitoring, including import/export controls, contraband, customs and the Harmonized System. The participants requested that UNEP:

- investigate the possibility of creating a network for English-speaking Caribbean countries;
- produce pamphlets on ODS phase-out issues in Spanish;
- prepare an Information Paper on replacing R-12 with liquid petroleum gas (LPG) in domestic refrigerators;
- conduct training on replacement of R-12 with hydrocarbons (including LPG) in domestic refrigerators;
- arrange a regional technical assistance/training workshop for customs officers in Latin America;
- include Spanish trade names provided by Latin American countries in the list of trade names currently being compiled by UNEP.

Contact: UNEP IE OzonAction Programme,  
fax: (33) 1 44 37 14 74

## Ozone science news

### Ozone researchers receive Nobel prize

The 1995 Nobel Chemistry prizes were awarded to three scientists who led the fight to alert the world to the dangers of the ozone depletion: Paul Crutzen from the Netherlands, Mario Molina, a Mexican-born American, and American F. Sherwood Rowland. The Royal Swedish Academy of Sciences, which awards the prizes, acknowledged that these three researchers 'have contributed to our salvation from a global environment problem that could have catastrophic consequences'. In 1974 Molina and Rowland published the now-famous article in *Nature* which revealed the threat to the ozone layer from CFC gases.

### UV radiation on the rise

Ultraviolet (UV-B) radiation reaching the Earth's surface has been increasing by about 8 per cent per decade in the spring, summer, and early autumn at mid-latitudes (40°) since 1980, according to a report presented to an International Union of Geodesy and Geophysics meeting held recently in Boulder, Colorado, United States.

To find out whether changes in cloud cover or haze might have affected the amount of UV reaching the ground, Jax Herman of the Goddard Space Flight Center and his colleagues analysed a data set from the Total Ozone Mapping Spectrometer (TOMS). The researchers found no long-term changes in clouds or haze that would affect UV reaching the surface. The researchers concluded that though the tropics have seen no significant increase in UV, at higher latitudes greater ozone loss would have resulted in a calculated UV increase at the surface of 10-12 per cent per decade.

Contact: Goddard Space Flight Center, fax: (1) 301 286 1664

### New ultraviolet meter

An American company, Sunsor Inc., has produced an ultraviolet meter that 'combines ultraviolet intensity, skin type, skin reaction and exposure time to ensure that users can enjoy accurate and intelligent exposure' to sunshine. The meter is being used by hotels and cruise ships to inform clients on ultraviolet intensity.

Contact: Sunsor Inc., fax: (1) 412 492 9309

## The UNEP ozone awards

UNEP's ozone awards were presented during the programme commemorating the 10th anniversary of the Vienna Convention by Mrs Elizabeth Dowdeswell, Executive Director of UNEP. She said:

'Truly, hundreds of men and women who have helped humanity recognize and solve a clear environmental danger deserve our thanks; the few honoured here have made truly outstanding contributions.'

Contact: UNEP Ozone Secretariat  
fax: (254) 2 521 930

### The winners

Daniel L. Albritton, Stephen O. Andersen, Rumen D. Bojkov, Victor Buxton, Eileen Claussen, Paul Crutzen, Joe Farman, Tan Meng Leng, Juan Antonio Mateos, Mario J. Molina, F. Sherwood Rowland, Patrick Szell, Gary Taylor, Manfred Tevini, Jan C. van der Leun, Robert T. Watson, John Whitelaw

The Alternative Fluorocarbons Environmental Acceptability Study (AFEAS) and the Programme for Alternative Fluorocarbon Toxicity Testing (PAFT), Friends of the Earth Canada, Japan Electrical Manufacturers Association

## Workshop on ozone treaties

The International Workshop on Ozone Treaties and their Influence on the Building of International Environment Regimes was held on 4 December 1995. Hosted by the Government of Austria, the workshop was divided into four panels. Panel I discussed the Vienna Convention and the Development of the Ozone Regime with former UNEP Executive Director Dr Mostafa Tolba and US Ambassador Benedick as the main speakers. The panel mainly discussed the achievements made by governments that led to the Vienna Convention, especially the negotiation process and the application of the principle of common but differentiated responsibilities to protect a global commons.

Panel 2 speakers Dr Rumen Bojkov from WMO and Dr Daniel Albritton from NOAA mainly discussed the scientific uncertainties and the ozone regime. They emphasized that the present ozone treaties are based on scientific observations validated by hundreds of scientists all over the world.

The third panel focussed on implementation control, non-compliance procedures and dispute settlement. Speakers Mr Patrick Szell and Ms Iwona Rummel-Bulska stressed the importance of monitoring compliance to international agreements. In the case of the Montreal Protocol, implementation controls follow a strategy that is non-confrontational, conciliatory and cooperative.

The fourth Panel centred its discussion on the importance of implementation monitoring and non-compliance procedures, focussing specifically on the Implementation Committee of the Montreal Protocol. Mr David Viktor and Mr Hugo Schally of Austria underscored the importance of having a small, standing committee as part of the system of institutions to ensure compliance, one whose mandate is strict, but with a flexible cooperative approach.

Contact: UNEP Ozone Secretariat  
fax: (254) 2 521 930

## Ten years of achievement

Ten years after the signing of the Vienna Convention, and four years after the establishment of the Multilateral Fund to enable developing countries to comply with the Montreal Protocol's control measures, significant progress has been achieved:

- more than US\$420 million has been allocated for some 1100 projects which will phase out 63 000 tonnes of ODS;
- 7500 tonnes of ODS have already been phased out;
- 103 countries are developing or have developed national ODS phase-out plans called country programmes;

- 64 country programmes have been completed which will, when carried out, eliminate 142 000 tonnes of ODS;
- US\$11 million has been used to help 61 countries strengthen the institutions they need to protect the ozone layer; and
- developing countries, which are obliged to begin their phase-out activities only in 1999, are already well on the way to phase out.

Contact: Multilateral Fund Secretariat,  
fax: (1) 514 282 0068

## SNAP rule

On 2 October 1995, the US EPA issued a notice under the Significant New Alternatives Policy (SNAP) programme that proposes:

- HCFC Blends Delta and Zeta as acceptable substitutes for use in new and retrofit applications of CFC-12 in vehicle air conditioners, subject to certain use conditions;
- monochlorotoluenes and benzo-trifluorides (50 ppm and 25 ppm workplace standards respectively) as

acceptable solvent alternatives for metal, electronics and precision cleaning, and for aerosol cleaning, adhesives, coatings and inks, subject to workplace exposure limits;

- IG-55 (50 per cent nitrogen/50 per cent argon) and IG-01 (100 per cent argon) as acceptable halon alternatives in total flooding applications; and
- CF3I as an acceptable alternative for halon streaming agents in non-residential applications.

Contact: US EPA, fax: (1) 202 233 9665

## SMEs and halon banks discussed in Washington

Co-sponsored by the Alliance for Responsible Atmospheric Policy, the US EPA, the US Department of Agriculture, Environment Canada and UNEP, the 6th Annual International CFC and Halon Alternatives Conference (Washington DC, 23-25 October 1995) was attended by more than 2000 participants (see below).

The conference provided information on many issues affecting the industry, including implementation of HFC and HCFC technology, HCFC replacements, illegal refrigerant imports and the destruction of ODS. The event also provided a convenient venue for a number of complementary meetings.

Nineteen participants attended a roundtable discussion organized by UNEP which focused on technology transfer to small-and medium-sized enterprises (SMEs) in developing countries. The purpose was to identify key barriers to ODS phase out by SMEs; the additional information needed to overcome these barriers; and to give recommendations on what the Implementing

Agencies of the Multilateral Fund might do to make these strategies more effective.

The UNEP IE OzonAction Programme, in cooperation with the Halon Recycling Corporation, held a meeting of national halon bank managers from developed and developing countries. The meeting provided an opportunity for participants to:

- learn from the experiences of both developed and developing countries' halon banks;
- present the structures and approaches to halon banking taken by different countries;
- provide feedback to UNEP about the status of halon banking;
- interact with the Co-Chair of the Halon Technical Options Committee about halon banking issues; and
- establish lines of communication and working relationships to facilitate the international exchange of recycled halons.

Contact: UNEP IE OzonAction Programme, fax: (33) 1 44 37 14 74

*Produced in almost record time, the Proceedings of the International CFC and Halon Alternatives Conference (21-23 October 1995, Washington DC, United States) runs to more than 1000 pages and includes more than 100 contributions. It includes an address list of more than 300 speakers and moderators. The Conference was sponsored by the Alliance for Responsible Atmospheric Policy in cooperation with US EPA, Environment Canada, UNEP and the US Department of Agriculture. Next year's conference (21-23 October, Washington Hilton) will be called the International Conference on Ozone Protection Technologies.*

Contact: Alliance for Responsible Atmospheric Policy, fax: (1) 703 243 2874

## In brief ...

○ The 1995 Stratospheric Ozone Protection Awards from the US EPA were awarded to 61 individuals and organizations from 14 countries who have contributed to the control of ODS. One award went to a US customs officer for his work to prevent CFC smuggling. Greenpeace declined its award, for the promotion of hydrocarbon refrigeration, on the grounds that the United States still allows production of some ODS and supports HCFC use.

Contact: US EPA, fax: (1) 202 233 9665

○ Elf Atochem completed its 500th retrofit of refrigeration equipment—at the Lariboisière Hospital in Paris—on the eve of the first International Day for the Protection of the Ozone Layer.

Contact: Elf Atochem, fax: (33) 1 49 00 80 50

○ Ford is to invest more than US\$150 million in Portugal for the construction of a plant to manufacture compressors for CFC-free vehicle air conditioning. Production is expected to begin in 1998.

Contact: Ford, tel: (1) 313 390 9344

○ Ethiopia's Ministry of National Resources Development and Environmental Protection has created a steering group for the collection of data on the consumption of ODS, established a National Ozone Committee and banned the large-scale importation of second-hand refrigerators and coolers from developed countries.

Contact: National Meteorological Services Agency, fax: (251) 516308

○ Carrier Corporation in the United States has won a Department of Energy 1995 National Award for Energy Efficiency and Renewable Energy for the development of the company's centrifugal chiller which uses a patented turbine to achieve high energy efficiency with a chlorine-free refrigerant (HFC-134a).

Contact: Carrier, fax: (1) 315 432 3503



## Status of Ratification

(as at 31 October 1995)

### The Vienna Convention

151 Parties; no new Parties

### The Montreal Protocol

150 Parties; no new Parties

### The London Amendment

103 Parties; no new Parties

### The Copenhagen Amendment

48 Parties; no new Parties

## Recent publications

Baz, Peter, Meyersen, Klaus, and Legatis, Dirk. *GTZ Yearbook 95: hydrocarbon technology*. GTZ, Eschborn, Germany, 1995.

Makhijani, Arjun, and Gurney, Kevin R. *Mending the Ozone Hole: science, technology and policy*. MIT Press, Cambridge, Mass., and London, 1995.

Stockholm Environment Institute and UNEP IE. *Monitoring Imports of Ozone-Depleting Substances*. Paris, 1995.

*The Hydrocarbon Forum Proceedings*. Calor Gas, Slough, United Kingdom, 1995.

*The Halon Handbook*. Halon Users National Consortium Ltd, Godalming, United Kingdom, 1995.

## Forthcoming meetings

Winter Meeting of the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), Atlanta, Georgia, United States, 17–21 February 1996.

CFC and Halon Replacement Strategies, Dubai, UAE, 28–29 February 1996.

Halon Options Technical Working Conference, Albuquerque, New Mexico, United States, 7–9 May 1996.

## World news

### Singapore to eliminate CFCs by 1996

Singapore is expected to phase out the use of CFCs by 1996, according to a statement issued on the eve of the first International Day for the Preservation of the Ozone Layer. In 1994, Singapore reduced consumption of CFCs to about 20 per cent of its 1986 base year level. Other ODS will be controlled according to the schedule stipulated in the Montreal Protocol. The import of halons was banned by Singapore in early 1994. Additional control measures include a January 1995 prohibition on the use of vehicle air conditioners containing controlled CFCs in newly-registered vehicles and an April 1995 ban on the import of hydrobromofluorocarbons.

Contact: Ministry of Environment, fax: (65) 731956

### China speeds up CFC phase out

China is to accelerate its phase out of ODS by five years, moving the deadline up from 2010 to 2005. Government officials claim that pledges of financial aid from international donors will enable industry to perform the equipment upgrades and conversions necessary for an accelerated phase out. National studies on CFC-free appliances have also convinced policy makers that an earlier phase out is feasible.

Contact: National Environmental Protection Agency, fax: (86) 1 832 8013

### EU reduces essential uses

The quantity of CFCs and carbon tetrachloride allowed to be consumed in 'essential' uses in 1996 within the EU has been cut by a quarter from the 1995 quota. Last summer, the European Commission imposed a ceiling on production and consumption of the chemicals for these uses of 10 664 tonnes in 1995. The total was dominated by metered dose inhalers for the treatment of asthma and other lung diseases (see page 3).

Contact: EC DGXI (32) 2 29 69 559

### United States increases ODS taxes

The tax on ODS in the United States increased on 1 January 1996. The tax is based on the ozone-depletion potential of a compound and is set to increase every year until the year 2000. The tax on common CFCs (CFC-11 and CFC-12) was US\$5.35/pound (US\$11.8/kg) in 1995 and increases by US\$0.45/pound per year. In 1996 it is thus US\$5.80/pound (US\$12.8/kg). There no longer any

confusion over whether the tax applies to the import of recycled CFCs: the Internal Revenue Service has ruled that the tax is due on all imported CFCs.

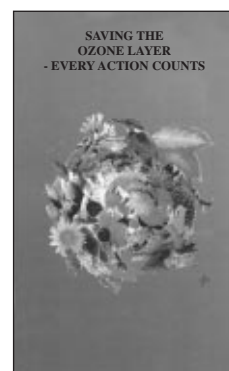
Contact: US EPA, fax: (1) 202 233 9665

### India to phase out ODS before 2010

India's Ministry for Environment and Forests has announced that India, like Brazil and China, will phase out the use of ODS before the official 2010 deadline set by the Montreal Protocol. The exact timing of the phase out will depend on the availability of the funds and the know-how needed to implement the phase out. It is estimated that the phase out in large and medium-sized Indian industries will cost at least US\$2000 million. India is completing a survey of the costs of phase out in small-scale industries, which account for most ODS use in India.

Contact: Ministry of Environment and Forests, fax: (91) 11 436 0678

*The OzonAction Programme launched its new 18-minute video Saving the Ozone*



*Layer on the International Day for the Protection of the Ozone Layer (16 September). The video is one of the awareness tools being distributed to developing countries and it emphasizes the*

*contribution developing countries can make to the phase out of ODS.*

Contact: UNEP IE OzonAction Programme, fax: (33) 1 44 37 14 74

OzonAction, a quarterly publication, is available in Arabic, Chinese, English, French, Portuguese and Spanish.

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

Please send comments and material for publication to Mr Rajendra Shende, Coordinator, OzonAction Programme, UNEP IE.

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