



## View point

## Ten years in: a foundation to build on



*Mohamed T. El-Ashry, Chairman and CEO, Global Environment Facility*

Ten years after the signing of the Montreal Protocol there is reason to celebrate.

The international community has taken steps to preserve the ozone layer—not just by agreeing on principles but by implementing clear and binding targets to reduce emissions that threaten our atmosphere.

The direct result: emissions of ozone-depleting substances are beginning to decline.

What is more, the Montreal Protocol is proving to be a global partnership that works. All parties have binding commitments, with differentiated goals. This is an important precedent for future international cooperation on environmental issues.

Our challenge now is to keep the spirit of Montreal alive in Kyoto. Clear targets, binding obligations and joint, yet differentiated, commitments are once again needed if we are to continue to make a difference on a global scale.

The Global Environment Facility's

operational strategy builds on four major principles: complementarity, consistency, synergism and effectiveness. Our experience shows that global environmental problems can and should be addressed in a more integrated way. For example, the phase out of ozone-depleting substances (ODS) often provides unique opportunities to achieve synergies by simultaneously reducing global warming potential.

The GEF plays a proactive role in assisting eligible countries in their efforts to phase out ODS and comply with the Protocol's schedule. Approved GEF projects totalling US\$110 million are helping to eliminate annual consumption of up to 45 000 tonnes of ODS in nine countries with economies in transition. Another six projects are under preparation, and more will follow once the Protocol is ratified by eligible countries.

Market-based approaches—such as sector-wide strategies that enhance the efficiency of ODS phase out—are now being applied at the national level. Their success depends on the growing understanding of the mutual interests of private and public stakeholders. Targeted efforts to build further public-private partnerships are needed to tap the potential of innovative market instruments to protect the global environment.

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**THE 1999 FREEZE IN PRODUCTION AND CONSUMPTION OF CFCs IN DEVELOPING COUNTRIES:  
 24 months to go!**

## OEWG meets in Nairobi

The 15th Meeting of the Open-ended Working Group (OEWG) took place in Nairobi, Kenya, 3-6 June 1997. Much of the discussion concerned methyl bromide and the HCFCs.

For methyl bromide, there was general agreement on critical use exemptions, control of trade with non-Parties and

emergency uses. However, there was no consensus on the US and Canadian proposals to advance the phase-out date in developed countries. As for the developing countries, the G-77 countries read a statement to the effect that a date could be fixed only after the demonstration projects in their countries had been completed

(some Latin American countries dissociated themselves from this statement).

On HCFCs, a number of countries opposed the EC proposal to advance the HCFC phase-out date for developed

*continued on page 8 ...*

## News from international agencies



### **Fund Secretariat**

The Fund Secretariat communicated the decisions of the 21st Executive Committee (ExCom) meeting to governments and advised the Treasurer of the Multilateral Fund (MF) to transfer approved funds to the implementing agencies. It updated the documents *Inventory of Approved Projects, Policies, Procedures, Guidelines and Criteria and Country Programme Summary Sheets*. It also discussed several issues with the implementing agencies including financial planning, 1997 business plans and work programme amendments, policy papers and logistics for the 22nd ExCom meeting.

The Secretariat organized the 22nd ExCom meeting and received and evaluated 173 project proposals, country programmes, 1997 business plans and work programme amendments, and 1996 progress reports of the implementing agencies. It also prepared 19 policy and other documents and evaluation sheets with recommendations on 127 investment projects and 5 country programmes.

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### **UNEP IE OzonAction Programme**

At its 22nd meeting, the ExCom approved four country programmes and their institutional-strengthening projects. Funding was also approved for the renewal of institutional-strengthening projects for Burkina Faso and Cameroon.

UNEP IE began to prepare guidelines for developing Refrigerant Management Plans; a revised proposal will be presented to the 23rd ExCom meeting in November.

Meetings of ODS Officers' Networks were held for English-speaking Africa, Latin America, Central America, the Caribbean and West Asia (see page 6).

The 2nd Intergovernmental Consultative Meeting for countries with economies in transition (CEITs) was held in Tashkent, Uzbekistan, 15–16 May 1997 (see page 9). *Saving the Ozone Layer:*

*guidelines for United Nations offices* was disseminated at the Council for Sustainable Development meeting in April.

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### **UNEP Ozone Secretariat**

The Secretariat organized and serviced the 17th and 18th meetings of the Implementation Committee, the First Meeting of the Bureau of the 8th Meeting of the Parties and the 15th Meeting of the OEWG.

The Secretariat attended the meeting of the TEAP in Brugge in April, the meeting of GEF's Governing Council, the Workshop for ODS Officers from English-speaking African countries, the 2nd Intergovernmental Consultative Meeting of High Ranking Officials of CEITs and the First Regional Focal Points Meeting for ODS Officers' Network–West Asia.

The Secretariat is preparing documents consolidating the proposals by the Parties to amend or adjust the Protocol and the decisions recommended by the 15th OEWG (see page 1), to be forwarded to all Parties for their 9th Meeting.

A Secretariat Draft of the Data Reporting Formats with a questionnaire and instructions was distributed at the 15th OEWG meeting.

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Internet: <http://www.unep.org/unep/secretar/ozone/home.htm>



### **UNDP**

At the 22nd ExCom Meeting,

UNDP received US\$17.33 million in project approvals for investment projects, US\$60 000 for an SME survey in Mexico and project preparation funding. A total of 55 investment projects were approved which will eliminate 2729 ODP tonnes. In Egypt, the approved umbrella foam project will eliminate 317 ODP tonnes in 11 enterprises, completing ODS phase out in the foam sector. A pioneering approach to treating SME enterprises in the rigid foam

sector in India was also approved.

Over the past few months, UNDP completed 14 investment projects, eliminating 910 ODP tonnes. The Eversafe portable fire extinguisher project in Malaysia has phased out 579 ODP tonnes and eliminated the use of halon-1211 portable fire extinguishers in the country.

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Tel: +1 212 906 5042 Fax: +1 212 906 6947  
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### **UNIDO**

The 22nd ExCom meeting approved five more formulation and four demonstration projects in the methyl bromide/ fumigant sector. It also approved 5 domestic refrigeration projects, 1 refrigeration/compressor project, 1 commercial refrigeration project, 11 projects in flexible foam, 4 rigid PU foam projects, 7 projects in the aerosol sector, 5 projects in the solvent (CFC-113) sector, and 6 projects in recovery and recycling. The total approval figures for investment projects for UNIDO execution by the last ExCom amount to US\$18.3 million which will phase out nearly 5000 tonnes of ODP.

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### **World Bank**

The World Bank portfolio now consists of more than 300 projects which will phase out more than 45 000 ODP tonnes. The Bank continues to work on the development of more cost-effective approaches to ODS phase out such as sector-wide approaches, phase out in the ODS production sector and policy-based dialogue with the major ODS-consuming countries.

The first big step should be launched in 1997 with the expected approval of a sector-wide project to phase out halons in China. By the end of the first year, some 6000 ODP tonnes are expected to be phased out. The overall approach includes an accelerated phase out of halon-1211 with a total of 35 000 ODP tonnes phased out.

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## Industry and technology updates

### **AEROSOLS AND MISCELLANEOUS USES**

#### **Phase-out plans for CFC inhalers**

The US Food and Drug Administration (FDA) has suggested a scheme for the phase out of CFC-containing metered dose inhalers (MDIs). The FDA proposal includes no specific timetable for the phase out of CFC-containing inhalers. Instead, the proposal would eliminate the 'essential use' status for entire classes of inhalers—such as corticosteroids—after three products, including two with different active ingredients, have been on sale for a year. It would also eliminate specific CFC-based inhalers for individual active ingredients when one alternative has been on sale for a year.

In Sweden, 80 percent of patients are now using dry powder inhalers instead of CFC-based products. The European Union is considering a scheme similar to that of the FDA except that the two different active ingredients must be manufactured by different firms. In the United States, a newsletter called *Good for You, Better for the*

*Environment* is being produced by the American Lung Association and the Asthma and Allergy Foundation of America to report on the transition to CFC-free inhalers.

Contact: FDA, tel: +1 301 594 2041

UNEP IE OzonAction Programme needs more information on technical innovations in Article 5 countries. Please send suitable material for Industry and Technology Updates to the UNEP IE OzonAction Programme for inclusion in OAN 24.

for HCFC-22.

R-410A is a mixture of HFC-32 and -125. This blend is characterized by relatively high operating pressures and therefore requires compressor redesign. For this reason, many other manufacturers have chosen to use R-407C or R-404A.

Contact: Sanyo Air Conditioning Division  
fax: +81 276 91 8838  
Internet: <http://www.sanyo.co.jp/>

#### **Ammonia used as refrigerant in ice thermal storage system**

Japan's first ammonia ice thermal storage system for district cooling has been developed jointly by the Mayekwa Manufacturing company and the Chubu Electric Power Company. The system uses ammonia, a zero ODP refrigerant, to freeze water during the night-time hours of cheap electricity. The ice is then used to provide cold water for office and domestic cooling during the day, thus helping to level out electric demand over each 24-hour period.

In the United States, Unicom Thermal Technologies of Chicago has now teamed

### **REFRIGERANTS**

#### **Sanyo develops HFC compressors**

Sanyo is planning to introduce a new range of compressors using an HFC blend such as HFC-410A in 1998, which it expects will be more efficient and compact. According to a report in the *IEA Heat Pump Newsletter* (vol. 15, no. 1, 1997), Sanyo has selected the HFC blend in preference to R-407C as a replacement

## ***New SNAP proposals and rules***

### **Proposals**

On 21 May, the US EPA issued a notice of proposed rulemaking that it intends to restrict or prohibit the use of certain ODS substitutes under its Significant New Alternatives Policy (SNAP) Program which determines acceptable non-ODS alternatives in the United States. The restrictions include:

- NARM-12, -22 and -502 (all blends of HCFC-22, HFC-23 and HFC-152a) as substitutes for R-12, R-22 and R-502 respectively due to their high global warming potential and long atmospheric life;
- chlorobromomethane (Borothane) as a solvent substitute for CFC-113, methyl chloroform and HCFC-141b, and as a substitute for halon-1301 (as a result of a SNAP toxicity evaluation which suggests an occupational exposure limit of 2–5 ppm, an estimated ODP of 0.17–0.28, and the availability of other substitutes);

The US EPA notice includes as acceptable the use of:

- HFC-4310mee (Vertrel XF™) as a substitute for CFC-113 and methyl chloroform in metals cleaning subject to exposure limitations;
- HFC-227ea for halon-1211 in streaming applications for non-residential uses only;
- HFC-236fa as a substitute for halon-1211 in streaming applications for non-residential uses only when manufactured in a process that does not convert perfluoroisobutylene (PFIB) directly to HFC-236fa in a single step, and in fire suppression, explosion suppression and explosion inerting applications subject to narrowed use limits;
- HCFC-225 (AKA-225) as a substitute for CFC-113 and methyl chloroform in solvent aerosol applications subject to exposure limitations.

### **Rules**

The latest SNAP rulings were published on 3 June 1997.

- MT-31 is now acceptable in retrofitted and new refrigeration systems as a

- substitute refrigerant for CFC-12 and as a substitute for HCFC-22 in all retrofitted end-uses. MT-31 is a blend which contains an HCFC but its exact composition is claimed to be confidential business information. The use of MT-31 as a CFC-12 substitute in vehicle air conditioning has not yet been approved.
- GHG-X5, a blend of HCFC-22, HFC-227ea, HCFC-142b and isobutane, is now acceptable as a substitute for CFC-12 and R-500 in retrofitted and new refrigeration systems including motor vehicle air conditioners.
- ICOR, a blend containing HCFC-22 and HCFC-142b, is acceptable as a substitute for CFC-12 in retrofitted and new refrigeration systems (ICOR has an estimated ODP of more than 0.05).
- The saturated light hydrocarbons C3-C6 are now acceptable substitutes for HCFCs in polyurethane integral skin foam.

Contact: US EPA, fax: (1) 202 233 9665  
Internet:  
<http://www.epa.gov/docs/ozone/title6/snap/612not7.txt>

up with three utilities to provide district cooling using a similar system but with HCFC refrigerants. The system freezes a single block of ice measuring some 30 x 30 x 12 metres. The block is melted in sections the following day, releasing chilled water at about 1 °C.

Contact: Chubu Electric Power Co., fax: +81 52 973 3161 |; Unicom, fax: +1 312 634 3201

### Advice for consumers on repairing car air conditioners

The US EPA has produced a brochure called *It's Your Choice: Retrofitting Your Car's A/C System* to advise consumers about the options available when repairing vehicle air conditioners.

Most air-conditioned vehicles made before 1994 use CFC-12 refrigerant. If the air conditioner needs repairing, the options are to recharge the system with CFC-12 or to convert to a non-CFC-based refrigerant.

The brochure helps car owners determine which choice is better for them, and which refrigerant to switch to if conversion is the right option. Car owners are also urged to make sure that they have leaks fixed.

Contact: US EPA, fax: (1) 202 233 9665  
Internet: <http://www.epa.gov/ozone/title6/609>

### New British refrigerator uses hydrocarbon refrigerant

The British manufacturer Lec Refrigeration has launched a new refrigerator using hydrocarbons both as the

refrigerant and for blowing the insulation foams used in the machine. The refrigerant chosen was CARE 30, a purified blend of propane and isobutane developed as a replacement for CFC-12 and HFC-134a by Calor Gas in the United Kingdom.

The new refrigerator is said to conform with the European ecolabel (which requires a GWP of less than 15, an ODP of zero and an energy efficiency which falls into bands A or B of the European Energy Labelling scheme).

Contact: Lec, fax: +44 1243 858052  
Calor Gas, fax: 44 1753 588905  
Internet: <http://www.calorgas.co.uk>



**ISCEON 59 substitutes for HCFC-22**  
Rhône-Poulenc has introduced ISCEON 59 as a substitute for HCFC-22 in new and existing air-conditioning, chilling and freezing equipment, using the lubricants traditionally used with HCFC-22. The company claims that the new refrigerant offers higher energy efficiency and lower discharge temperatures. ISCEON 59 is a blend of HFCs, PFC-218 and propane.

Contact: Rhône-Poulenc, fax: +33 1 47 68 23 18

## FIRE FIGHTING

### Airlines to install fire-suppression systems in cargo holds

As a result of the investigation into the crash of a ValuJet in May 1996 that killed 110 people, the US Federal Aviation Administration (FAA) is to require fire-suppression systems in what are currently known as Class D cargo compartments—the unventilated compartments found on narrow-body aircraft such as Boeing 737s, McDonnell Douglas DC-8s and DC-9s, and Airbus A320s. The ValuJet investigation indicated that the fire barrier between the passenger cabin and cargo compartment did not meet safety expectations during the incident. The Class D compartments on these types of aircraft will now be reclassified as Class C compartments requiring both smoke detection and suppression devices. Approximately 3000 US aircraft now in service will be retrofitted by 2001 at a cost of US\$292 million.

Halon-1301 is the only suppression agent currently certified for use in this application. This and other critical aviation uses are being met by recycled halons from halon banking organizations. No application has been submitted to the Parties to the Montreal Protocol for an essential use production exemption to meet this need.

Aviation certification bodies, military and civilian users, and aircraft manufacturers are cooperating to develop alternatives to halons for aviation applications. The search for alternatives for other aviation uses is particularly challenging due to space/weight constraints. Safety and toxicity of alternatives at extinguishing concentrations is of critical importance to passengers during in-flight use. Certified alternatives for small fire suppression systems for aircraft lavatory waste receptacles are now commercially available.

Contact: FAA, fax: +1 202 267 3446

## METHYL BROMIDE

### Irradiation may be a good substitute for methyl bromide

Low-level irradiation could become a practical alternative to methyl bromide as a pest quarantine treatment for fruit, according to ongoing studies by the US Department of Agriculture (USDA).

Irradiation interrupts the development and reproductive capacity of fruit flies,

## Concern expressed over self-cooling cans



Self-cooling beverage cans may be opposed in Europe and the United States if attempts are made to introduce them. The cans incorporate a self-cooling mechanism involving the release of the refrigerant HFC-134a, which cools the can of drink by some 15 °C in about 90 seconds. The refrigeration mechanism is activated by a button on the bottom of the can.

The Chill Can™ has been developed by the Joseph Company in the United States. The company claims that its cans are not only

ozone-friendly but that they may actually reduce emissions of ODS by substituting for old and possibly leaky refrigerators. However, HFC-134a has a high greenhouse gas potential, and the prospect of larger-scale releases of it for this purpose has alarmed politicians and scientists in Europe, according to a recent report in the English *Independent* (18 May 1997). The UK Minister of the Environment Michael Meacher is quoted as saying he would press for an EU ban on their introduction to Europe.

Contact: UK Department of the Environment  
fax: +44 171 276 8285  
Joseph, fax: +1 714 347 7769  
Internet: <http://www.chillcan.com/>

## ***Survey shows chiller replacement rate is still slow***

A survey by the Air-conditioning and Refrigeration Institute (ARI) has shown that in the United States 53 percent of chillers will still need CFC refrigerants by the beginning of the year 2000, four years after CFC production was banned in developed countries.

US shipments in 1996 of 9197 non-CFC chillers to building owners around the world nearly equalled the previous year's record of 9444 units, but replacement and conversion of 4356 CFC units in the United States fell behind earlier expectations.

According to the new survey, there will be 4181 replacements and 1307 conversions in 1997, or a total of 5488 units, leaving 69 percent of the CFC chillers in service on 1 January 1998. The prediction for 1998 is 6114 units replaced and converted and 6862 more in 1999, leaving 53 percent, or 42 555 units still using CFCs on 1 January 2000.

Contact: ARI, fax: (1) 703 528 3816  
Internet: <http://www.ari.org>

thus enabling safe transport of produce to distant markets, but a drawback has been that the radiation doses thought necessary often damages the produce. Research by the USDA's Agricultural Research Service suggests that lowering irradiation levels would still be effective while minimizing fruit damage. Irradiation would also reduce the time necessary for quarantine, compared with methyl bromide. The USDA is also studying low-oxygen quarantine techniques.

According to the USDA, the Californian firm TransFRESH Corporation is developing an alternative to methyl bromide for use in killing fruit flies on citrus crops. The method involves holding the fruit in a low-oxygen atmosphere

Contact: USDA, fax: +1 210 565 6642  
e-mail: [hallman@pop.tamu.edu](mailto:hallman@pop.tamu.edu)

## ***RECOVERY AND DESTRUCTION***

### **New recovery facility for Manitoba**

A refrigerant recovery plant has been opened in St Boniface, Manitoba, Canada,

to cope with the legal requirement in the province for recovering refrigerants from the air-conditioning systems of vehicles to be written off through the Manitoba Public Insurance Corporation. The new plant is a result of the far-reaching regulations to protect the ozone layer that have been adopted in the province, including the creation of the Manitoba Ozone Protection Industry Association. Another bonus has been the halon recovery facility operated by Superior Safety, from Winnipeg. This has now been operating for more than a year and is one of the world's few halon recycling and reclamation facilities capable of reprocessing halons to near-perfect specifications

Contact: MOPIA, fax: +1 204 338 0810  
Internet: <http://www.mts.net/~mopia/mopia.htm>

## ***SOLVENTS***

### **Using carbon dioxide as a degreaser**

The US EPA and the Research Triangle Institute (RTI) have conducted a pilot study in which liquid CO<sub>2</sub> was used as a degreaser to clean aircraft parts.

Liquid CO<sub>2</sub> was tested as an alternative cleaning agent to 1,1,1-trichloroethane (TCA) at the Warner Robins Air Logistics Center (ALC) in the United States. Heavy grease and hydraulic fluids were removed from various parts easily. However, fine particles and carbonaceous wear were difficult to treat.

Liquid CO<sub>2</sub> has been approved under the US EPA's Significant New Alternatives Programme (SNAP) as an alternative to ODS cleaners; it is claimed to leave no solvent residue on cleaned components and be relatively cheap.

Contact: US EPA, fax: (1) 202 233 9665  
Internet: <http://epa.gov.ozone>

## ***Web site for TEAP***

The UNEP Technology and Economic Assessment Panel now has an official Web site. Documents, reports and membership lists from the TEAP and its Technical Options Committees are available from the site.

Contact: TEAP, fax: +1 416 250 0967  
E-mail: [webmaster@mail.taylorwagner.com](mailto:webmaster@mail.taylorwagner.com)  
Internet: <http://www.teap.org>

## ***In brief ...***

○ At the first Brazilian Meeting on Alternatives to Methyl Bromide in Agricultural systems held in Florianópolis, Brazil, participants agreed to reduce MeBr consumption by 20 percent by 2001 and to allow MeBr use only for quarantine, pre-shipment applications and essential uses by 2006.

Contact: Secretaria de Coordinación de Asuntos del Medio Ambiente  
fax: +55 61 317 1352

○ Three people employed by Refrigeration USA have pleaded guilty to smuggling more than 4000 tonnes of CFC-12 and will be required to surrender more than US\$4 million in cash held in offshore accounts, real estate in Miami and London valued at more than US\$3 million and 11 200 cylinders of CFC-12 with a value of US\$6.7 million.

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

○ The Consumer Aerosol Products Council in the United States claims that a recent poll shows that 65 percent of Americans are unaware of the ban on the use of CFCs in aerosols and believe that the aerosols still contain CFCs.

Contact: CAPCO, fax: +1 202 835 8886

○ Landfills in the United Kingdom may emit as much as 1000 tonnes of CFCs and HCFCs a year, according to a recent study by scientists at the Nottingham Trent University (*Environmental Science and Technology*, 1997, 31, pp. 1054-61). The finding showed that the highest emissions came from waste buried at least 20 years ago.

Contact: NTU, tel: +44 115 9418418

○ Zanussi Elettromecc Tianjin Compressor Co Ltd is planning to increase production of its HFC-134a compressors in China to 3 million units a year.

Contact: NEPA, fax: (86) 10 66151776

## Ten years of the Protocol: good news, favourable trends and issues to watch

With the Montreal Protocol now nearly ten years old, it is a good time to take stock. First, the good news:

- CFCs, halons, carbon tetrachloride and methyl chloroform have been phased out in developed countries;
- as a result, the growth rates of CFCs and methyl chloroform in the stratosphere have slowed down;
- industry, government and NGOs have evolved effective forms of partnership for tackling ozone issues; and
- the trend of making decisions based on science and technology assessments has been established.

Second, the favourable trends:

- 87 Article 5 countries have set up National Ozone Units and prepared phase-out plans;
- more than US\$500 million has been allocated to Article 5 countries and as much again has been pledged till 1999;
- 20 000 tonnes a year of ODS have been phased out in individual projects under the MF, well ahead of target, and a further 75 000 tonnes will be phased out once all approved projects are implemented;
- some Article 5 countries are phasing out ODS faster than required under the Protocol.

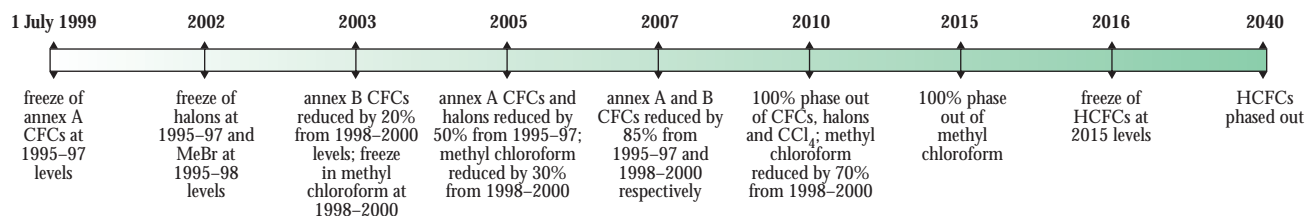
Third, the issues to watch:

- the project-by-project approach has proved complicated in some situations;
- consumption of ODS is still increasing in some Article 5 countries;
- significant work needs to be done to mobilize SMEs and LVCs in phase-out activities;
- policy making and enforcement still lag behind phase-out progress;
- while the implementation of approved projects has recently been accelerated, it is still slower than Parties would like.

Overall, however, prospects are good for completion of the phase-out schedule for Article 5 countries (see timeline) on schedule.

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

### Phase-out schedule for Article 5 countries



## Network news

### French-speaking Africa

The Second Follow-up Meeting of the ODS Officers' Network for French-speaking Africa was held in Libreville, Gabon, 2-3 April 1997. ODS Officers from 17 countries attended.

There were presentations and discussions on the status, formats and need for reporting of ODS consumption data, on the implementation of country programmes and on progress in implementing institutional-strengthening projects. Countries summarized phase-out progress since the previous meeting.

### West Asia

The First Regional Workshop for ODS Officers in West Asia was held 19-22 May 1997 in Bahrain. ODS Officers from six countries participated, together with representatives from the MF Secretariat, the Ozone Secretariat, the UNEP IE OzonAction Programme and UNIDO.

This first meeting focused discussions on networking as a way of learning about the implementation of phase-out activities in other countries as well as receiving information from the implementing

agencies and the secretariats. The participants discussed their specific concerns such as data reporting, issues on the MF, information and training needs, and how to meet the 1999 freeze. The meeting suggested that the League of Arab States should be kept informed of activities. The meeting was held under the patronage of H. E. Sheik Khalid Bin Abdallah Al-Khalifa.

### Caribbean

The First Meeting of the ODS Officers' Network for the Caribbean was held in Barbados, 12-16 May 1997. Officers from 11 countries in the region and from Canada, the United Kingdom, the United States the implementing agencies and the MF Secretariat participated.

The meeting focused mainly on the operational mechanism of the new network, and briefings were given on the roles of the implementing agencies, the MF and the Ozone Secretariats, and bilateral agencies. Major areas of concern such as how to meet the 1999 freeze, regulations and customs code were also discussed. The role of the Organization of Eastern Caribbean States (OECS) in the network was also discussed, and it was

proposed to that the OECS be used as an executing body for investment projects at the request of governments.

### English-speaking Africa

The Third Follow-up Meeting of the ODS Officers' Network for English-speaking Africa was held 7-9 May 1997 in Addis Ababa, Ethiopia. It was attended by 18 ODS Officers and representatives of the Ozone Secretariat, UNEP IE and UNIDO.

The meeting highlighted activities to meet the 1999 freeze, and emphasized the need to share information on effective strategies so that countries can learn from one another. Although data reporting has improved substantially for African countries, there was still some discussion on the importance of efficient and timely reporting.

A position paper is to be prepared on impediments to technology transfer in African countries, and presented to the African representative on the informal group on transfer of ODS-free technology in preparation for the 9th Meeting of the Parties in Montreal.

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

Internet: <http://www.unepie.org/ozonaction.html>

## 22nd ExCom meets in Nairobi

At the 22nd meeting of the ExCom held in Nairobi, 28–30 May 1997, the main emphasis of the discussion was on how project approvals in 1997 will affect the ability of Article 5 countries to comply with the 1999 freeze on the consumption and production of annex A CFCs. The Committee approved US\$70.3 million for 172 projects, 169 of which will be carried out in 46 countries, while the rest will be global activities.

It was reported that US\$47 million of the carry-over figure of US\$74 million of unpaid contributions during 1991–96 has been received, and the rest could be collected by the end of this year. The collection rate for 1997 contributions remains at a low 1.2 per cent, although there were indications that more would be received shortly. Resources available at the time of the meeting were US\$62 million.

Decisions taken during the meeting included the following:

- US\$67.2 million was approved for 135 investment projects to phase out 9821 tonnes of controlled substances in 35 countries;
- approval was given for US\$800 000 for bilateral cooperation in 3 countries, US\$2.3 million for institutional strengthening in 8 countries, project preparation in 16 countries, ODS surveys in 2 countries and a special allocation of US\$400 000 for preparation of refrigerant management plans by UNDP, UNEP and UNIDO.
- targets for ODS approvals and expenditures for the 1997–99 triennium (with the 1998 and 1999 figures subject to review) were endorsed;
- priority to be given during 1997 and the first half of 1998 to projects with the highest ODP value and short implementation times for countries that have yet to meet the freeze obligations;
- halon projects to continue to receive high priority in view of their cost effectiveness and the high ODP of halons;
- adopted procedures for monitoring and evaluation of the MF for a 12-month period during 1997–98;
- requested UNEP, in consultation with the Fund Secretariat, implementing agencies and ExCom members, to

## *Phase-out successes under the Multilateral Fund*

### **Cameroon produces CFC-free refrigerators**

The first series of CFC-free refrigerators and freezers manufactured by the Douala, Cameroon, based-firm FAEM went on sale in June 1997 with assistance from the Multilateral Fund (project CMR/REF/13/INV/05 for US\$1.9 million executed by UNIDO). FAEM is the first firm in Africa to convert to the use of a non-ODS refrigerant (HFC-134a). Furthermore, the refrigerators will sell for 20–30 percent less than other models available on the Cameroon market. FAEM will use information and advertising campaigns, and workshops involving NGOs, repairers and distributors to promote the new products.  
Contact: Cameroon National Ozone Office  
fax: +237 23 94 61

### **Uruguay replaces CFC-11 with water and HCFC-141b in foam production**

Thanks to a project funded through the Multilateral Fund and executed by UNDP (URU/FOA/13/INV/06), seven Uruguayan

firms have eliminated 70.8 annual tonnes of CFC-11 used in the production of rigid polyurethane. The firms are Aislaciones de Uruguay, Metalizadora Uruguaya, ThermoPur, Kubal S. A., Kalisay S. A., J. C. Scarone and Eraton S. A. The CFC-11 they used to use was supplied by Bayer, Dow Chemical and ICI, who cooperated fully in the conversion to a water/HCFC-141b system at a total cost of US\$665 000.

Contact: UNDP, fax: +1 212 906 6947

### **Malaysian firm converts portable fire extinguishers to ABC and CO<sub>2</sub>**

The Malaysian firm Eversafe has replaced its annual production of 56 000 halon fire extinguishers with 30 000 extinguishers using ABC powder and 30 000 extinguishers using CO<sub>2</sub>. Total cost of the investment project funded by the Multilateral Fund was nearly US\$180 000 and the project was implemented by UNDP (MAL/ HAL/18/INV/72). A total of 579 tonnes of ODP have been saved.

Contact: UNDP, fax: +1 212 906 6947

review and submit revised guidelines for refrigerant management plans to be submitted to the 23rd ExCom;

- the Fund Secretariat and the implementing agencies to discuss and review the process of setting chemical prices and submit a paper to the 23rd ExCom meeting;
- adopted guidelines for calculating incremental operating costs of compressor projects and for change of technology of approved projects, as well as measures to address delays in project implementation;
- adopted the calendar year as the term of office of each ExCom irrespective of the date of the Meeting of the Parties and approved the calendar of meetings;
- agreed that the implementing agencies will submit only one progress report a year, on 1 May; and
- agreed that from 1998 Article 5 countries will submit reports on implementation progress by 1 May each year.

Contact: Fund Secretariat, fax: +1 514 282 0068  
E-mail: secretariat@unmfs.org

## *Ozone depletion art project*



*An entry from the US EPA ozone depletion art project by Carly Caramanna, 5th grade, East Dover Elementary, Toms River, New Jersey, United States. The entries can be seen on*

Internet: <http://www.epa.gov/ozone/art/drawings.html>

... continued from page 1

countries and the Swiss proposal to initiate HCFC production controls.

Significant progress was made in developing a proposal to establish a licensing system for the import and export of ODS to curb illegal trade. The group also considered controlling exports of products containing ODS and, after 1999, banning the export of recycled substances from ODS-producing Parties found to be in non-compliance with related control provisions.

Other proposals included:

- all Parties should discourage the development and promotion of new ozone-depleting substances and related technologies;
- the TEAP should study the feasibility of decommissioning non-essential use halon systems and destroying the halons not required; and
- developed countries should not market any more CFCs.

The meeting approved the essential uses recommended by the TEAP: 837 tonnes for 1998 and 9335 tonnes for 1999.

Contact: UNEP Ozone Secretariat, fax: +254 2 623 913; e-mail: madhava.sarma@unep.org; Internet: <http://www.unep.org/unep/secretar/ozone/home.htm>

## New TEAP report

The Technology and Economic Assessment Panel (TEAP) reported its 1997 work at the 15th OEWG (see page 1). This year's work, which reports on many more issues than normal, is published in two volumes, of which the second includes reports on MDIs, process agents, flammable refrigerants and the economic feasibility of methyl bromide alternatives. The TEAP

- found that it is technically feasible to phase out about 75 percent of non-quarantine and pre-shipment methyl bromide use by 2001, provided that current emergency and routine essential use provisions are modified and made applicable to methyl bromide; it also found no compelling reasons why developed and developing countries could not pursue similar phase-out schedules (which would speed technology cooperation and help ensure that Article 5 countries had access to the most environmentally-acceptable options).
- recommends that Parties consider the advantages of treating chemical process agents in the same manner as feedstocks and considering technology

cooperation and financing of emission reduction and process conversion projects in Article 5 countries.

- recommended that Parties grant the essential use request for CFC use in MDIs (asthma/COPD), halon for critical uses in the Russian Federation, and a two-year extension of the global exemption for laboratory and analytical uses pending January 1998 reports on actual applications and quantities used; the TEAP was unable to recommend ODS use for other medical applications (sterile aerosol talc and Leuprolide), ODS use as solvents for general purpose cleaning, and CFC use for the servicing of refrigeration and air-conditioning systems.

Other TEAP findings concerned HCFC applications where no-ODS alternatives are available, the use of flammable refrigerants, and the restructuring of the TEAP to its new Terms of References. The TEAP invited nominations for expert members for the Technical Options Committees, and mentioned in particular that the position of Article 5(1) Co-Chair of the Economics Options Committee is vacant.

Contact: Internet: <http://www.teap.org>  
Printed copies: fax: +44 1438 748844

## Ozone science news

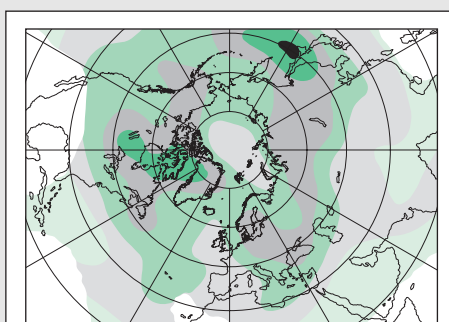
### Ozone thins over Arctic

The ozone layer is continuing to thin over the North Pole. WMO reported in April that the ozone layer was 15–25 percent thinner over the Arctic in March 1997 than it was in March 1996. The worst-affected area was over the North pole region and north-central Siberia.

On 8 April 1997, the US National Aeronautics and Space Administration (NASA) reported that average ozone values over the Arctic during March were 40 percent below the 1979–82 mean.

A long-lasting spell of very cold temperatures in the lower stratosphere and the abundance of ODS are thought to be to blame for this year's unusually strong depletion.

Ozone values during late March and early April were 'the lowest ever measured' over the Arctic by the Total Ozone Mapping Spectrometer (TOMS) instruments, according to the NASA Goddard Space



225–275	275–325	325–375
375–425	425–475	>475

### Total ozone values in Dobson units over the Northern Hemisphere on 15 April 1997.

Source: WMO, Internet:  
<http://www.athena.auth.gr:80/ozonemaps/>

Flight Center. The minimum satellite-measured value of total column ozone, 219 Dobson units (DU), was recorded on 24 March. Monthly average levels for northern polar latitudes in March are normally 460–500 DU.

The TOMS findings were corroborated by other instruments, including NASA's Earth Probe satellite and Upper Atmosphere Research satellite (UARS), the US National Oceanic and Atmospheric Administration's NOAA-9 and NOAA-14 satellites, and Japan's Advanced Earth Observing Satellite.

On 26 March, the UARS satellite measured a 'very low' ozone concentration of less than one part per million northeast of Hudson Bay, Canada, at an altitude of 19.8 km. Normal ozone concentrations in the region would be around three to four parts per million at this time of year. Another notable finding came from balloon-borne instruments by Environment Canada at two northern Canadian research sites, which measured ozone at 60 percent below normal between the altitudes of 9.9–24.8 km during March.

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## Meetings

### Refrigeration TOC meets in Paris

The UNEP Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee held its regular meeting in Paris, 9–10 June 1997. The meeting was attended by 33 experts.

The main issues discussed were directly related to the Assessment Report which is due to be published on 31 October 1998. A Subcommittee and a Task Force had produced an *Assessment Report on the Use of Flammable Refrigerants* (hydrocarbons) which is part of the April 1997 TEAP report, Volume II. Several members of this Subcommittee and Task Force gave presentations on issues related to flammable refrigerants. The US, Nordic and Article 5 countries' perspectives were highlighted. Overviews were given of the safety issues involved, the suitability of a propane-isobutane blend for retrofits of refrigerators and energy consumption. Suitability of the blend is currently the subject of a study performed under the umbrella of UNEP IE. The Russian TOC member stated that the Russian domestic appliance industry would be in favour of the (flammable) azeotrope HFC-152a/HC-600a; this azeotrope had been extensively tested and would yield good energy consumption values. The TOC

agreed that, if retrofit procedures were considered in the 1998 Assessment Report, the most important criterion should be the quality of the product after the retrofit.

Contact: TEAP, Internet: <http://www.teap.org>

### Central Asian CEIT countries discuss Protocol implementation

Implementation of the Montreal Protocol by countries with economies in transition (CEITs) was the subject of a two-day meeting held in Tashkent, Uzbekistan, 15–16 May 1997. Organized by UNEP, UNIDO and the State Committee for Nature Protection of Uzbekistan, the meeting was funded by the GEF and a bilateral contribution from Germany. It brought together high-ranking officials from six central Asian republics.

The aim was to explore ways for Central Asian CEITs to accelerate ratification of the Protocol and its Amendments, and to discuss opportunities and requirements for financing the phase out of ODS from the GEF, which has already approved more than US\$100 million for phase-out activities in the CEIT countries.

Each country described its position, the barriers it faced, and ways of overcoming these barriers. The countries

agreed to issue a common statement to the Implementation Committee and Meeting of the Parties reiterating their commitment to protect the ozone layer but requesting special consideration on compliance in view of their unique political and historical situations.

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### Halon Options Technical Working Conference (HOTWC)

The seventh HOTWC, recently concluded in Albuquerque, featured the presentation of 43 papers and 21 posters. The 168 conference attendees included scientists from 30 states and 7 nations. In addition to CGET and NMERI, the conference sponsors were the Halon Alternatives Research Corporation, the National Association of Fire Equipment Distributors, Hughes Associates, Inc., Kidde International, and the Fire Suppression Systems Association.

The 1998 HOTWC will be held May 12–14, 1998, in Albuquerque, New Mexico, United States.

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e-mail: [jaramillo@nmeri.unm.edu](mailto:jaramillo@nmeri.unm.edu)

## Nordic countries pursue use of natural refrigerants

Several European countries—including the Nordic countries, Germany and the United Kingdom—are now placing great emphases on the use of 'natural' refrigerants, particularly hydrocarbons, in their refrigeration and air-conditioning industries. Hydrocarbon refrigerants can be used in most vapour compression systems without major changes to the system.

Norway has several large industrial refrigeration plants using hydrocarbon refrigerants, mainly in the petrochemical industry. New applications are the use of propane in heat pumps and in commercial refrigeration systems. Two large heat pumps for heating and two supermarket cooling plants using hydrocarbons have been built. In addition, *Guidelines for Safe Design and Operation of Hydrocarbon Heat Pumps and Refrigeration Systems* is expected to be available by the beginning of 1998.

In Sweden most manufacturers have converted their production of refrigerators and freezers to iso-butane. Furthermore,

there are some 60 commercial installations of propane chillers ranging in capacity from 20 to 300 kW. All the chiller systems use secondary loop systems on the cold side. Finland has also converted household refrigerator and freezer manufacture to iso-butane.

Denmark has the most stringent environmental policy of the Nordic countries, and the Danish EPA has put HFC refrigerants on the 'List of undesirable products due to their effects on man and/or the environment'. The goal is to phase out all HFC refrigerants within nine years. (The usage of new HCFC refrigerants will be banned by the year 2002.) Danish manufacturers of household refrigerators and freezers are converting to iso-butane.

Ammonia is also being used as a refrigerant by several Nordic companies, even on ships.

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### *International Conference on Natural Working Fluids*

The International Institute of Refrigeration (IIR) will hold the third international conference on Natural Working Fluids, the IIR Gustav Lorentzen Conference, 2–5 June 1998, in Oslo, Norway. The main objectives will be to discuss the latest research results and advances, as well as industrial solutions, in the use of natural working fluids such as ammonia, hydrocarbons, water, air and carbon dioxide in refrigeration. The deadline for abstracts is 1 September 1997.

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<http://www.termo.unit.no/kkt/iir/>

## Status of Ratification

(as at 6 June 1997)

### The Vienna Convention

165 Parties; new Party: Belize

### The Montreal Protocol

162 Parties; no new Parties

### The London Amendment

115 Parties; new Party: Botswana

### The Copenhagen Amendment

66 Parties; new Party: Botswana

## Recent publications

*Ozone Protection in the United States: elements of success*, Elizabeth Cook (ed.), World Resources Institute, 1996

*Alternatives for Methyl Bromide in Kenya and the East African region*,

J. W. Klijnstra, TNO Institute of Industrial Technology, Delft, The Netherlands, 1997.

*Environmental Code of Practice on Halons*, Environment Canada, July 1996

*Proceedings of the Conference in Research, Design and Construction of Refrigeration and Air-conditioning Equipments in Eastern European Countries*, Bucharest, Romania, September 1996

## Forthcoming meetings

10th Anniversary Colloquium on Natural Social Sciences and Technology in Relation to the Montreal Protocol, Montreal, Canada, 13 September 1997

9th Meeting of the Parties to the Montreal Protocol, Montreal, Canada, 15–17 September 1997

Swiss/Netherlands/German/UNEP Workshop on Hydrocarbons as Replacements in New Refrigerators, 8–9 September 1997, Montreal, Canada

International Conference on Ozone Protection Technologies, Baltimore, Maryland, United States, 12–13 November 1997

## World policy round-up

### Malawi outlines ODS policy

Malawi is in the process of drafting new regulations on the management of ODS. As a result mainly of a public awareness programme, Malawi managed to reduce ODS consumption by 24 percent during the period 1992–95. Part of the public awareness programme is the inclusion of the words 'Ozone Layer Protection saves life. Buy CFC-free fridges and aerosols' on every electricity bill that is issued.

Contact: Ministry of Environment, fax: +265 781 487

### Cameroon publishes a synthesis of ozone legislation

The National Ozone Office in Cameroon has published a booklet that synthesizes all the legislative measures adopted in Cameroon to preserve the ozone layer. Called *Synthesis of the Regulations on the Protection of the Ozone Layer in Cameroon*, the booklet is available in both French and English.

Contact: Cameroon National Ozone Office fax: +237 23 94 61

### Hydrocarbon refrigerants gaining acceptance in Europe

European countries are moving closer to the acceptance of the use of hydrocarbons in household refrigerators and window air-conditioning units. Germany has already accepted the use and Japan is being pressured by environmentalists to do the same.

In the United States, the International Electrotechnical Commission (IEC) Subcommittee SC61C on Household Appliances for Refrigeration is proposing an amendment to existing regulations that would allow the use of up to 150 grammes of hydrocarbons in household appliances. The European standards body, CENELEC, will adopt the IEC amendment when it is approved. In effect, this will approve the use of hydrocarbons in household refrigerators and food freezers in all 15 nations of the European Union.

Contact: EC DGXI, fax: +32 2 29 69 559

### Dutch government bans export of used refrigerators

The Dutch government is to ban the export of used refrigerators and freezers with effect from 1 January 1999 as a result of stringent new legislation being proposed by the Dutch Ministry of the

Version 5.0 of the OzonAction Information Clearinghouse diskette (OAIC-DV) is now available. It is Windows™-based, and contains many new features. Available from UNEP IE, it costs 330 FF or US\$60.

Environment. The ban is part of a larger proposal that will require manufacturers to take back used white and brown goods. It will ensure that all CFCs contained in such goods are properly recovered in the Netherlands and will stop the export of these goods to countries in East Europe where the CFCs are extracted and sold on the black market.

Contact: VLEHAN (Dutech home appliance industry association), fax: +31 70 301 0198

### Japan outlines CFC collection methods

An advisory panel to Japan's Ministry of International Trade and Industry (MITI) has released a report which suggests that, because demand for recycled CFCs is declining, manufacturers should be required to pay for the collection costs of CFCs from old equipment and that consumers should pay personnel and other costs. The report favours a programme of private-sector initiatives and consumer cost-sharing, with central government giving some support to private industry and helping in recovery assessment.

Contact: MITI, fax: (8) 3 3501 1511

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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