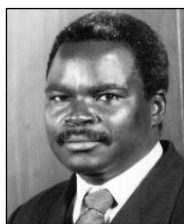




View point

1 July 1999: now is the time to act

*Mr July Moyo,
Secretary for the
Environment,
Ministry of
Environment and
Tourism,
Zimbabwe*

After the success of the meeting of the Parties in Costa Rica, and in particular, the replenishment of the Multilateral Fund, the biggest steps still lie ahead. On 1 July 1999, developing countries are committed by the Montreal Protocol to freeze their consumption of chlorofluorocarbons (Annex A CFCs) at

their average levels of consumption during the period 1995–97. The date is significant because this will be the first control measure under the Protocol that will be met by developing countries. Several developing countries have already reached this landmark target while many others are now finalizing their plans to meet the target on or before time.

Zimbabwe, for instance, is in the midst of implementing its country programme and institutional-strengthening project. We are confident that through the coordinated efforts of government and industry, and the assistance provided by

the Multilateral Fund, we will meet our targets under the 1999 freeze.

However, not all countries are at the same level of preparedness for the phase out, and many will require specific assistance. Countries that consume low volumes (LVCs) of ozone-depleting substances (ODS), for example, will need help in the refrigeration sector if they are to meet the targets set by the Montreal Protocol (see table page 9).

As indicated in the June 1996 TEAP Report, the importance of non-investment projects at this stage of the Protocol implementation cannot be over-emphasized. This is especially relevant to the African region where investments for conversion will not be significant. The challenge of controlling the consumption of methyl bromide is also formidable, and this control will include a number of non-investment activities.

The role of all implementing agencies is crucial in assisting LVCs in the preparation and financing of non-investment projects.

Collectively, we have come a long way—to a stage which looked very distant just ten years ago. Addressing the needs of the LVCs still looks very distant—but we have begun.

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THE 1999 FREEZE IN PRODUCTION AND CONSUMPTION OF CFCs IN DEVELOPING COUNTRIES: 27 months to go!

21st ExCom meets in Montreal

The 21st Meeting of the Executive Committee (ExCom) of the Multilateral Fund was held in Montreal, 18–20 February 1997. The status of the Fund was reviewed (see page 8) and the report of the Subcommittee on Project Review was considered. The 1997 work programmes of the implementing agencies and project proposals worth US\$14.9 million were approved,

which will eliminate 1021 tonnes of ODS.

- Other important decisions included:
- the US\$74 million carried over from 1996 would be allocated to the 1997 budget for planning purposes to help developing countries meet the 1999 freeze;
 - better means of evaluating performance would be developed so

that the relative performance of the agencies could be evaluated before their 1998 business plans were considered;

- a summary status report would be developed for each Article 5 country showing their progress towards phase

continued on page 8

News from international agencies



Fund Secretariat

The Fund Secretariat prepared for and organized the 21st Meeting of the Executive Committee held in

Montreal, 18–20 February 1997. It also convened a coordination meeting of the implementing agencies (UNDP, UNEP, UNIDO and World Bank) at which resource allocations for the purpose of business planning was agreed. It reviewed for the 21st Meeting the 1997 Business Plans and work programmes of the implementing agencies, four country programmes and 15 project proposals, including those for bilateral cooperation. The Secretariat also prepared several policy papers including the Financial Planning of the Multilateral Fund for the Triennium (1997–99); the Three-Year (1997–99) Business Plan of the Multilateral Fund; and report on actions to improve the functioning of the Financial Mechanism. It organized meetings of the Production Sector Expert Group and the Executive Committee's Sub-Group on Production Sector.

The Secretariat notified relevant governments of project approvals and decisions of the 21st Meeting of the Executive Committee relating to their countries, and distributed the report of the Meeting to the Parties of the Montreal Protocol. It began preparation towards the 22nd Meeting of the Executive Committee to be held in Nairobi, Kenya, 28–30 May 1997.

Contact: Dr Omar El Arini, Secretariat of the Multilateral Fund, 1800 McGill College Avenue, 27th Floor, Montréal, Québec H3A 3J6, Canada
Tel: +1 514 282 1122 Fax: +1 514 282 0068
E-mail: mleyva@unmfs.org



UNEP IE OzonAction Programme

The 1997 Work Programme totalling US\$2.81 million consisting of US\$2.15

million for recurring activities and US\$0.66 million for non-recurring activities was approved at the 21st ExCom. The meeting also approved funding for the preparation of Refrigerant Management Plans for 7 LVCs, national training country programme formulations and institutional strengthening projects. Three country programmes and their respective institutional-strengthening projects (St. Kitts and Nevis, Paraguay, and the Democratic People's Republic of Korea) were also approved at this meeting,

including the institutional-strengthening project for St. Lucia.

The OzonAction Programme held its 6th Informal Advisory Group Meeting to review UNEP's proposed work programme for 1997 during 9–10 January 1997.

The programme also organized the last of a series of national training workshops in Chillers and Refrigerant Management in Jakarta, Indonesia during 26–27 February 1997 (see page 8).

A meetings of the ODS Officers Network for Southeast Asia and the Pacific was held in Melbourne, Australia during 28 February–2 March, back-to-back with the 'Life After Halons' Conference. The 5th version of the OAIC diskette was released.

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



UNEP Ozone Secretariat

The Secretariat is preparing the documentation for the 15th Open-ended Working

Group (OEWG) to be held in Nairobi, 3–6 June 1997. Six Parties (Australia, Canada, the European Community, India, Switzerland and the United States) have submitted proposals for amendments of the Montreal Protocol at the next meeting of the Parties in September 1997.

Six Parties (Australia, the European Community, Hungary, the Russian Federation, South Africa and the United States) have submitted Nominations for Essential Uses of ODS for the years 1998 and 1999, which are now being evaluated by the Technology and Economic Assessment Panel (TEAP) and its Technical Options Committees (TOCs).

The Secretariat attended the meetings held in Bangkok by the Methyl Bromide TOC and the Methyl Bromide Task Force of the Economic Options Committee, the 21st ExCom Meeting and the Conference on Atmospheric Effects of Aviation, in Virginia Beach, Virginia, United States.

Contact: Mr K. M. Sarma, UNEP Ozone Secretariat, PO Box 30552, Nairobi, Kenya
Tel: +254 2 623 885 Fax: +254 2 623 913
E-mail: madhava.sarma@unep.no
Internet: <http://www.unep.org/unep/secretar/ozone/home.htm>



UNDP

UNDP presented its draft 1997

Business Plan at the 21st ExCom meeting. It included 134 investment projects in 34 countries to eliminate 5720 ODP tonnes at a cost of US\$43 million. Half the funding is for ODS phase out in the three largest countries (Brazil, China, India) to help them meet the 1999 freeze. Low-volume ODS-consuming countries are also covered, and account for 32 of the 51 countries where UNDP is active.

UNDP completed 70 projects in 1996, raising the number of projects completed during 1991–96 to 173. Total ODP elimination in 1996 was 1212 tonnes.

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

At the 21st ExCom Meeting, four investment projects were approved for UNIDO execution, as

carry-overs from last year's allocation, amounting to US\$533 000.

UNIDO's Work Programme for 1997 covering 18 countries and amounting to US\$760 000 was approved at the same meeting. Work on formulating further investment projects and projects in the methyl bromide sector continues.

Contact: Angelo D'Ambrosio, UNIDO, PO Box 300, A-1400 Vienna, Austria
Tel: +43 1 21131 5085 Fax: +43 1 21131 6853
E-mail: adambrsio@unido.org



World Bank

The 21st ExCom Meeting approved additional funding of US\$4.35 million to support five new projects in

Indonesia and Thailand. With this new approval, the total allocation that the World Bank received in 1996 was US\$43.5 million. The Bank now has 318 investment projects with a value of more than US\$200 million in its portfolio. When completed, these projects will phase out more than 47 000 tonnes of ODS. By the end of 1996, more than US\$71 million had already been disbursed to enterprises, and more than 13 600 tonnes of ODS had been eliminated.

Contact: Mr Ken Newcombe, World Bank, 1818 H. Street, N.W. Washington D.C. 20433, USA
Tel: +1 202 477 1234 Fax: +1 202 522 3256
E-mail: knewcombe@worldbank.org

Industry and technology updates

AEROSOLS AND MISCELLANEOUS USES

Dry cleaning without CFCs

A study gathering the experiences of the Nordic dry cleaning establishments where dry cleaning methods alternative to the one using CFCs have been investigated showed two promising and widespread alternatives: hydrocarbon dry cleaning and wet cleaning.

Two hydrocarbon technologies were tested: Satec's transfer system and Swiss Clean's dry-to-dry system. The wet cleaning systems used were by Miele/Kreussler, Electrolux/Wascator and Ipso. The conclusions gathered show that dry cleaning with hydrocarbons has a potential to replace CFC cleaning totally. Wet cleaning, on the other hand, also shows some promise; however, observations show that it should only be a supplement to cleaning with perchloroethylene.

Contact: Nordic Council of Ministers, Copenhagen
Fax: +45 33 96 02 02

Refining raw LPG for propellants

In the United States, Petro Project Engineering, of Houston, Texas, has designed the AERO® process—Advanced Extraction and Removal of Olefins—for refining raw liquid petroleum gas (LPG) to produce what the company describes as a high-quality

Below: schematic diagram of the Petro process for converting raw liquid petroleum gas into a aerosol-grade product suitable for use in the personal care industry.

propellant. The process converts olefins to alkanes, mercaptans to hydrogen sulphide, and removes odour-causing chemicals. The result is a product that is claimed to be suitable for use in hair sprays, deodorants and air fresheners.

Petro has recently completed the design of an 11 000 tonnes/year plant to be built later this year in China. Smaller plants are also available, as is a process to manufacture dimethyl ether as a propellant.

Contact: Petro, fax: +1 281 470 0732

REFRIGERANTS

Eliminating refrigerants from telecom switching centres

British Telecom is eliminating the refrigerants previously used to cool its switching centres by converting to air-cooled systems. The move has eliminated large volumes of CFCs and HCFCs, halved the energy consumption of the centres and resulted in substantial reductions in annual CO₂ emissions, according to the *Global Environmental Change Report* (28 February 1997).

More than 100 centres have now been converted and BT claims to be the first telecommunications company in the world to convert to the new but simple technology which, in effect, replaces complicated cooling systems with a simple fan.

The conversion has been made with the help of the US fluid dynamics software and service company Flomerics Ltd, of Marlborough, Massachusetts.

BT has received the Premier Prize in the

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

UK's 1997 Business Commitment to the Environment awards for the innovation.

Contacts: BT, fax: +44 171 405 6875
Flomerics, fax: +1 508 624 0559

New chillers use non-ODS substitutes

The US company Carrier Corporation has announced that its new line of Ecologic chillers uses HFC-134a refrigerant, has higher operating efficiencies, lower sound levels and smaller footprints than previous models. The 30HX range is water cooled and the 30GX range is air cooled. The company claims that the new range meets its requirements for refrigerant, efficiency, quieter operation, and product size and material reduction.

Contact: Carrier, fax: +1 315 432 3503

New alternative for R-503

Dehon Service announced that it has recently added Forane 508B to its product line as a suitable replacement for R-503 for lower temperature refrigeration used in laboratories. Forane 508B, from Elf-Atochem, is a refrigerant blend of HFC-23 and FC-116.

Compared to R-503 (a blend of HFC-23 and CFC-13) this alternative has higher condensation pressure, evaporation pressure and rate of compression.

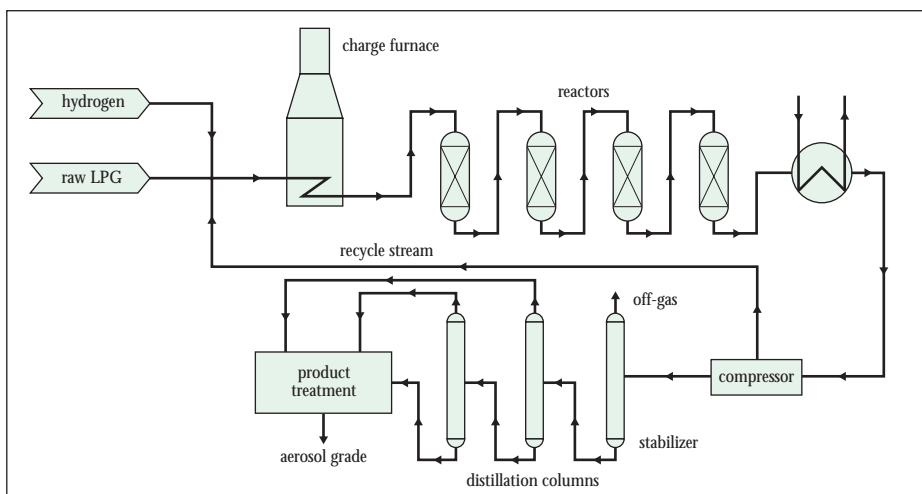
Contact: Dehon, tel: +331 43 98 75 00

FIRE FIGHTING

Four new alternatives for halons

DuPont has introduced four new fire extinguishants as halon replacements: FE-13™ (CHF₃) is used as a total flooding agent for normally occupied areas; FE-25™ (CF₃CHF₂) is a total flooding agent for normally unoccupied areas; FE-241™ (CF₃CHClF) is a total flooding agent for unoccupied areas and can be used as a streaming agent in portable fire extinguishers (with some hardware modifications); and FE-36™ (CF₃CH₂CF₃) is available for testing and evaluation as a streaming and flooding agent.

Contact: DuPont, fax: +44 1442 218575



FOAMS

HFC-245fa gets comparative approval

A study by AlliedSignal gives HFC-245fa high marks as a foam-blowing agent. The study compared three such agents: HFC-245fa (CF₃CH₂CF₂H), HCFC-141b (CCl₂FCH₃) and CFC-11 (CCl₃F). The main conclusions of the study are that:

- HFC-245fa performs well as a blowing agent in an appliance foam;
- aged k-factors of the HFC-245fa foam are lower than those of the aged HCFC-141b foam;
- foam properties of the HFC-245fa exceed those of the HFC-141b foam;
- dimensional stability of the HFC-245fa foam is excellent;
- some consideration must be given to techniques for processing HFC-245fa.

Contacts: AlliedSignal, fax: (1) 201 455 6395

US EPA approves foam-blowing HCFC alternatives

The US Environmental Protection Agency (US EPA) officially approved the use of saturated light hydrocarbons as alternatives to HCFCs in the manufacture of polyisocyanate and polyurethane rigid boardstock foams on 10 March 1997. The agency also approved the use of HFC-134a, saturated light hydrocarbons, and carbon dioxide in the manufacture of polyurethane rigid appliance foam.

USEPA noted that any manufacturer that switched to hydrocarbons would probably have to make additional investments to ensure safety during handling, use and shipping because of the flammability of hydrocarbons. In the United States, they must also be controlled in accordance with the Clean Air Act because they are volatile organic compounds.

The US EPA has also approved the use of HFC-236fa as an alternative to CFC-114 in industrial process heat pumps.

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

METHYL BROMIDE

Fungal extract promises good nematode control

Extensive tests at the US Abbott Laboratories in Long Grove, Illinois, are confirming that the use of DiTera®, a natural product made from the *Myrothecium* fungus, is an effective way of controlling nematode infestations. Tests over the past nine years have shown that the product can be used to protect carrots, cauliflower, egg plant and squashes; tests on grapes and citrus fruits are under way. Field evaluations on carrots have resulted in 53 percent marketable carrots, compared to the 55 percent obtained when the crop was treated with methyl bromide.

DiTera® was discovered at the Abbott Laboratories, which holds several patents on the material, ten years ago. The product has now been approved for use in several US states, including California, Florida and Texas, and has been registered for use in Chile. It is available as a spray-dried powder or a liquid, and a granular product is being developed.

Contact: Abbott Laboratories,
fax: +1 847 367 2913

Significant improvements to diatomaceous earth

Diatomaceous earth products are registered for use as structural, grain, house and garden pest control insecticides. 'Protect-It' is a natural, non-toxic and environmentally safe alternative to methyl bromide.

Produced by Hedley-Pacific Ventures, this product is a significantly improved diatomaceous earth which is effective in controlling pests in stored grain at 75–100 ppm. Collaborative research between Hedley-Pacific Ventures and Agriculture and Agri-Food Canada (Winnipeg Research Centre) led to the development of this product. It has been field tested and is registered with Health Canada for use in the control of the rusty grain beetle.

Contact: Hedley Pacific Ventures,
fax: +1 604 685 6039

Physical and environmental properties of CFC-11, HCFC-141b and HFC-245fa

	molecular weight	boiling point (°C)	conduct. (mW/mK)	flammable limits ² (vol. %)	TLV or OEL (ppm)	GW ¹	ODP
CFC-11	137	24	7.4 ³	none	1000	4000	1.0
HCFC-141b	117	32	8.8 ³	7.3-16.0	500	630	0.11
HFC-245fa	134	15.3	14 ⁴	none	n/a	950	0

Source:

Sourcebook of Technologies for Protecting the Ozone Layer: flexible and rigid foams (UNEP IE, 1996)

Notes:

¹ 100 years

² in air

³ gas conductivity in air measured at 10 °C

⁴ gas conductivity in air measured at 40 °C

Five countries and the EC table Protocol amendments

Several changes to the Montreal Protocol are proposed for the 9th Meeting of the Parties and will be discussed at the 15th Meeting of the OEWG during 3–6 June 1997. The full text of the proposed adjustments and amendments to the Montreal Protocol was distributed to all the Parties by the Ozone Secretariat and is available from the Ozone Secretariat Home Page.

The adjustments and amendments are from six Parties: Australia, Canada, the European Community, India, Switzerland and the United States. They relate to a licensing system for imports and exports of

ODS, control of trade by Parties not in compliance with the Protocol, trade restrictions on used, recycled and reclaimed substances, further interim reductions steps for carbon tetrachloride for Parties operating under Article 5, accelerating the phase out of methyl bromide and HCFCs, reduction of the HCFC cap, control of trade in methyl bromide with non-Parties, the production baseline for Parties operating under Article 5, and control of production of HCFCs.

Contact: UNEP Ozone Secretariat,
fax: +254 2 623 913

Ozone community to be studied

Two sociologists at the University of Denver (Colorado, United States) are studying the make-up and structure of the global ozone community. This spring Drs Penelope Canan and Nancy Reichman will be contacting the experts around the world who served on the UNEP Technology and Economic Assessment Panel and their Technical Options Committees since 1988. The purpose is to understand how these committees have contributed to the implementation process. The sociologists will then conduct interviews with TEAP/TOC members. It is hoped that this work will provide lessons on organization that will speed ODS phase out and perhaps inform procedures on how to address other global environmental problems. Summaries of the results will be reported in OAN.

Contact: fax: +1 303 871 2090
e-mail: pcanan@du.edu

RECOVERY AND DESTRUCTION

CFC separation techniques improve

The US firm Davco CFC Processing has developed a technique for separating R-12 from a mixture of R-12 and R-22 in quantities of up to 400 kg a day. The technique is effective on all mixtures containing no more than 20 percent R-22 and no more than 10 percent refrigerant oil. The recovered R-22 is claimed to be of a quality that exceeds the 99.5 percent purity standard.

A similar development is announced in the United States by Liberty Technology International which has completed construction of a facility dedicated to CFC separation which is claimed to be able to recover all components in the mix. Many previous techniques used destructive separation and recovered only the principal ingredient.

Contacts: Davco, fax: +1 610 559 1401
Liberty Technology, tel: +1 908 686 4099

SOLVENTS

Substitute for CFC-113

In the United States, the Occidental Chemical Corporation is marketing a range of cleaners based on the parachlorobenzotrifluoride (PCBTF)

molecule. Marketed as the OXSOL® range, the cleaners are volatile organic solvents that are claimed not to harm the ozone layer or cause global warming. In the United States, they are VOC exempt and are not classified as Hazardous Air Pollutants. The cleaners are suitable for use in vapour degreasing systems, as cold cleaning solvents for wipe cleaning or precision cleaning, and as drop-in replacements for CFC-113.

Contact: Occidental Chemical Corporation,
tel: +1 972 404 3301

New precision vapour degreasing agent

Borothene is being marketed by the US firm Advanced Chemical Design as a drop-in replacement for 1,1,1 trichloroethane and CFC-113. The active ingredient is stabilized mono-chloro-mono-bromoethane, and the firm claims that the product has low toxicity and outstanding cleaning power at a low cost. A patent is pending.

The agent is said not to affect aluminum, magnesium, ferrous metals and most plastics and elastomers. The agent is recommended in vapour degreasers and ultrasonic cleaners, and is claimed to be as strong or stronger than any of the chlorinated solvents. It can be used to dissolve all the greases, fats, oils, waxes, resins, gums and rosin fluxes generally encountered in any metal-working, electronic or precision-cleaning application.

Contact: Advanced Chemical Design,
fax: +1 216 291 5949

New aqueous cleaner

The US firm ETUS, Inc. has developed a range of ODS-free degreasers and cleaners. RB Degreaser/cleaner is an aqueous concentrate, is said to be non-toxic, non-caustic, non-flammable and biodegradable, yet can be used to remove oils, greases and other deposits from metals, glass, plastics, fabrics, rubber, concrete and other hard and soft surfaces. It can be applied by soaking, dipping, wiping, brushing and spraying; and is used in soak tanks, dip tanks, parts washers, electro-cleaners, ultrasonic cleaners, vapour degreasers, floor scrubbers, pressure washers, steam cleaners and tumblers. Proprietary inhibitors protect metal surfaces from corrosion during cleaning operations and provide temporary rust protection. A 'demulsifier' feature separates the oils and grease from solution. The cleaners and degreasers are on the US EPA's SNAP list of acceptable alternatives to ODS.

Contact: ETUS, Inc., fax: +1 407 321 3098
e-mail: etus@env-sol.com

In brief ...

○ Poland has earmarked US\$3.5 million to decrease its use of CFC-12 by 20 percent annually. The project is being financed by the EkoFund, an independent Polish agency financed by fines imposed on the country's heavy industrial polluters and a debt-for-equity swap of part of the Polish state debt to foreign countries.

Contact: Ministry of Industry and Trade,
fax: +48 22 6212550

○ The Aeropres Corporation claims that its new hydrocarbon propellants are at least four times cheaper than any other substitute. Aeropres, a US company, stresses that its propellants can be used in both medical and food applications.

Contact: Aeropres, fax: +1 316 429 6739

○ Refron, Inc. in the United States provides information on the Internet for wholesalers seeking information about supplies of recycled or recovered CFCs.

Contact: <http://www.refron.com>

TEAP opens its Internet site

The UNEP Technical and Economic Assessment Panel opened its Home Page on the Internet (<http://www.teap.org>) on 24 March 1997. The site provides the public with current information on TEAP activities and membership, and serves as a source for downloading full versions of final and draft reports, technical notes, etc.

Files will be made available in Adobe Acrobat format which enables viewing by cross-platform users (DOS, Windows, MacIntosh and UNIX).

Readers with questions regarding this service should contact Mr Gary Taylor, Co-Chair of the Halons Technical Options Committee.

Contact: G. Taylor, e-mail:
GTaylor@mail.taylorwagner.com

Network news

UNEP IE OzonAction Programme operates networks of ODS Officers in English- and French-speaking Africa, Southeast Asia and the Pacific, and in South and Central America to promote information and knowledge sharing. New networks are planned for the Caribbean and for West Asia later this year. All are funded from the Multilateral Fund except that for Southeast Asia which is funded by Sweden.

Southeast Asia and the Pacific

The follow-up meeting was held during 28 February-1 March 1997 in Melbourne, Australia, back-to-back with the 'Life after Halons' conference, and was hosted by the Australian government. ODS Officers discussed progress as well as common problems related to ODS phase out, the development of a regional approach to halons and heard a presentation on

Malaysia's success in MAC recovery and recycling. Other discussions included revision of the present format on data reporting, recent developments in the Montreal Protocol, possible agenda items for the next OEWG, highlights of the recent ExCom meetings, and a review of the recently approved UNEP work programme including the refrigeration management plan.

Key points to emerge from the meeting to improve and strengthen ODS phase-out programmes in the SEAP region included:

- Malaysia and Indonesia are the only countries in the network consuming more than 100 tonnes of halons, meaning they would be eligible for assistance in establishing Halon Banks under the Multilateral Fund;
- a paper would be prepared on the halon situation in the region that

would include Australia's capabilities in recovery, recycling and destruction, and Malaysia's and Indonesia's capabilities in halon banking;

- Australia and UNIDO would present case studies on alternatives to methyl bromide at the next meeting;
- all countries will be able to meet the 1999 freeze;
- at the next meeting, an expert would be identified to discuss alternatives to HCFCs in the air-conditioning sector, focusing on the efficiency and use of HFC-134A in tropical countries;
- the next meeting would also review results from the chiller training courses in Thailand, Philippines and Indonesia.

Contact: UNEP IE OzonAction Programme,
fax: +33 1 44 37 14 74
Internet: <http://www.unepie.org/ozonaction.html>

10th Anniversary of the Montreal Protocol: 1987-97

Preparations for the 10th anniversary of the Montreal Protocol are well under way. Plans are being drawn up jointly with Environment Canada for a series of events to be held in Montreal, Canada. These include:

- a Technology Showcase with the theme *A Decade of Technology Transfer under the Montreal Protocol: Lessons Learned*, including an exhibition of technologies and a series of presentations (9-17 September);
- a Science Colloquium (September 12-13) to provide an opportunity for the scientific community to share its views with participants through presentations and discussions;
- TEAP Industry Celebration Dinner, including the 'Best-of-the-Best' awards (14 September);

- the Ninth Meeting of the Parties to the Montreal Protocol (15-17 September);
- the 10th Anniversary of the Montreal Protocol (16 September);
- International Ozone Day (September 16) will include special presentations and events;
- UNEP 1997 Ozone Awards (16 September);
- a special edition of *Our Planet* on ozone issues;
- a video on the 10th anniversary; and
- selection of outstanding ODS Officer for each region.

Details are available on the Internet from the Ozone Secretariat's home page which has



been revised and updated to include the San José Meeting Reports, a list of forthcoming meetings, the list of publications of the Secretariat and the Agenda of the 15th Open-ended Working Group (OEWG).

Commemorative postal stamps for the 10th anniversary

The International Postal Union (IPU), as a result of cooperation with the UNEP Ozone Secretariat in Nairobi, is inviting its members to issue postal stamps to mark the Tenth Anniversary of the Montreal Protocol. In response to Circular No. 428 issued by the IPU, ten countries—Argentina, Belarus, Brunei Darussalam, Czech Republic, Islamic Republic of Iran, Kazakhstan, Pakistan, Peru, Poland and

Zambia—will be issuing postage stamps by September 1997.

Countries are encouraged to commemorate this event by responding positively to this invitation. Those who wish to do so may contact the Ozone Secretariat for design ideas. Samples of these commemorative stamps will also be published as an insert in the October issue of OAN.

Contacts:

The Secretariat, 10th Anniversary of the Montréal Protocol, Environment Canada,
fax: +1 819 953 0550;
e-mail: ozone97@marbek.ca

UNEP Ozone Secretariat, fax: +254 2 623 913
e-mail: madhava.sarma@unep.no
Internet: <http://www.unep.org/unep/secretar/ozone/home.htm>

UNEP IE, OzonAction Programme,
fax: +33 1 44 37 14 74
e-mail: ozonaction@unep.fr
Internet: <http://www.unepie.org/ozonaction.html>

Phase-out successes under the Multilateral Fund

Malaysia replaces CFCs in pipe insulation manufacture

The Malaysian firm Allied Foam Insulation has replaced CFC-11 in the manufacture of its pipe insulation products as a result of an investment project funded by the Multilateral Fund and implemented by UNDP (MAL/FOA/13/INV/043). The project was approved in July 1994 and completed in December 1996, eliminating 25 ODP tonnes through conversion to HCFC-141b technology.

Contact: UNDP, fax: +1 212 906 6947

Reusing methyl bromide in Chile

Environment Canada and the Chilean Exporters' Association have completed a project involving the transfer of a Canadian technology that will help reduce methyl bromide use in Chile. The technology, the Bromosorb unit, offers a means of reducing methyl bromide consumption during fumigation. The unit is attached to the chamber where the commodity (such as fruit or cut flowers) is to be fumigated. The unit recaptures and recycles the methyl bromide used in the fumigation. The methyl bromide is then reused during the next fumigation cycle instead of being vented to the atmosphere. The Bromosorb unit reduces consumption of methyl bromide by 75 percent and reduces emissions to the atmosphere by 95 percent.

Environment Canada, through a bilateral project under the Multilateral Fund of the Montreal Protocol, donated a

Bromosorb unit to the Chilean Government. In December 1996, the unit was installed at the David del Curto Plant in Kalinka. During commissioning, Chilean workers received hands-on training from Canadian technicians. Initial tests with the unit have produced promising results.

Contact: Environment Canada,
fax: +1 819 953 7253

Thai firm eliminates CFCs in foam manufacture

Thai Union has eliminated CFCs in the manufacture of rigid foam, cold-cure and integral skin foams as a result of another UNDP project (THA/FOA/15/INV/041). This project was approved in December 1994 and completed in December 1996, eliminating 45 ODP tonnes through conversion to HCFC-141b for rigid and integral skin foams, and a water-based system for flexible moulded foam.

Contact: UNDP, fax: +1 212 906 6947

Guatemalan firm eliminates CFCs

The Guatemalan firm Refrigua now produces refrigerators containing neither CFC-12 as a refrigerant nor CFC-11 as a means of blowing the insulation panels, thanks to a UNDP-implemented project (GUA/94/G62) which received funding of US\$195 000 from the Multilateral Fund. The project is phasing out the use of 24.4 ODP tonnes a year. Refrigua produces 18 000 refrigerators a year.

Contact: UNDP, fax: +1 212 906 6947

NASA converts wind tunnel to R-134a

The NASA Langley Research Center's Transonic Dynamics wind tunnel, in Hampton, Virginia, is converting its testing system from R-12 to R-134a. The system is the largest of its kind in the world using refrigerant gas. The new refrigerant charge, nearly 160 tonnes, will be HFC-134a supplied by ICI Klea, through Refron, Inc.

The wind tunnel, which is used for the testing of both commercial and military aircraft, has a volume of more than 28 000 m³. NASA uses refrigerant gas as the test medium because it is heavier than air and thus beneficial for aeroelastic testing.

The R-134a is delivered from a liquid storage vessel, through a steam-fed vapourizer, and into the wind tunnel. A 22 500-kW fan blows the vapour through the tunnel at speeds ranging from Mach 0.1 to 1.2. Approximately 45 tonnes of R-134a are vaporized into the tunnel during a typical test run. Following a test sequence, the R-134a is recovered from the tunnel using a powerful compressor and a low-temperature condensation system.

Refron, Inc., converted the storage tank from R-12 to R-134a, and recovered nearly 100 tonnes of R-12 refrigerant.

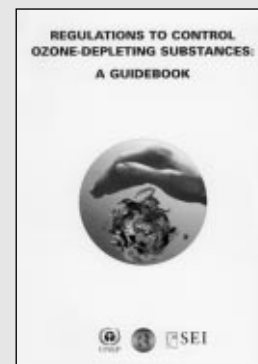
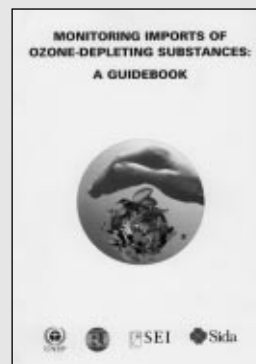
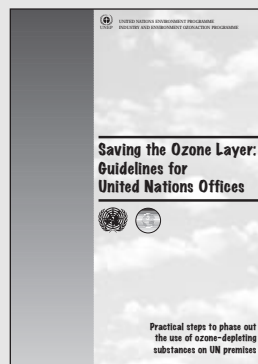
Contact: ICI Klea, fax: +1 302 887 7706;
Internet: www.iciklea.co.uk/klea

New Policy Guidebooks available

Saving the Ozone Layer: Guidelines for United Nations Offices, Practical Steps to Phase Out the Use of Ozone-Depleting Substances on UN Premises. UNEP IE OzonAction Programme, 1997

Monitoring Imports of Ozone-depleting Substances: a guidebook, UNEP IE OzonAction Programme in cooperation with the Stockholm Environment Institute and the Swedish International Development Agency, 1996.

Regulations to Control Ozone-depleting Substances: a guidebook, UNEP IE OzonAction Programme in cooperation with the Stockholm Environment Institute, 1996.



Contact: UNEP IE OzonAction Programme
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Internet: <http://www.unepie.org/ozonaction.html>

continued from page 1

- out and the difficulties they might face in meeting the 1999 freeze in consumption of annex A CFCs;
- a study would be made of ways in which the administrative costs of the implementing agencies could be reduced;
 - a standing Sub-committee on Monitoring, Evaluation and Finance was created to replace the previous Sub-committee on Financial Matters;
 - the country programmes of the Democratic People's Republic of Korea, Paraguay, and Saint Kitts and Nevis were approved;
 - the ExCom also provided initial guidance on the sectoral plan being developed by China and the World Bank to phase out ODS use in the

OAN on Internet

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Point your Web browser to:

<http://www.unepie.org/ozat/oan.html>

- halon sector—a new sector approach promising economies over the project-by-project approach;
- the World Bank to prepare a study on concessional lending to finance phase-out projects and ways of raising private-sector finance.

Contact: Multilateral Fund Secretariat,
fax: (1) 514 282 0068
e-mail: mleyva@unmfs.org

Indonesian training course on chillers and refrigerant management

UNEP organized the last of a series of training courses on chillers and refrigerant management in Jakarta, Indonesia, during 26–27 February 1997. The course was completed in cooperation with the Ozone Unit in the State Ministry for the Environment of Indonesia; 60 people from industry and government participated. Three lecturers from the Air-conditioning and Refrigeration Institute (ARI) in the United States provided the technical expertise for the training.

Contact: UNEP IE OzonAction Programme
fax: +33 1 44 37 14 74;
e-mail: ozonaction@unep.fr
Internet: <http://www.unepie.org/ozonaction.html>

Ozone science news

Melanoma on the rise

The incidence of malignant melanoma is rising at an alarming rate in the United States. Americans now have a 1 in 84 risk of developing melanoma in their lifetime, an 1800 percent increase since 1930, according to Dr Darrell S. Rigel of the New York University School of Medicine

The United States is not alone in this respect. Australia, Austria, Canada, Germany, Italy and Scotland have all experienced a significant increase over the past decades.

However, public awareness efforts have proven helpful because patients are now coming to their doctors earlier with suspicious lesions. This has led to an increased survival rate for patients with stage 1 melanoma from approximately 50 percent in the 1950s to approximately 90 percent today.

Contact: fax: +1 212 689 5748
e-mail: dsrigel@prodigy.com

Ozone hole report

Although the strength and longevity of the the ozone hole during the southern spring of 1996 was comparable with the events of the past four years, a few new records were set. The hole disappeared only in the first half of December 1996. The area exceeding 10 million km² lasted for about 85 days compared with about 70 for the previous four years and less than 30 days in the early 1980s. The hole covered an area larger than

15 million km² for about 70 days which has happened only once before, in 1995. A record low monthly mean ozone of 152 m atm cm was reported by the Halley station for September, by Syowa (156 m atm cm) for October and by Vernadsky (211, 225 and 270 m atm cm) for August, November and December respectively.

In the northern mid- and polar latitudes, ozone levels at the end of November and early December were 5–8 percent below the 1957–70 averages, with a deficiency of more than 20 percent over the north Atlantic, northern Europe and western Siberia. However, later in December until the end of February there was no spectacular decrease. The deviations were 5–10 percent below the averages expected from extrapolating the long-term ozone trend.

Contact: Dr R. D. Bojkov, fax: (41) 22 734 23 26;
e-mail: bojkov_r@gateway.wmo.ch

Do aircraft destroy the ozone layer?

In the 1960s, before CFCs were suspected of destroying the ozone layer, there were fears that large fleets of supersonic aircraft could have serious effects on the ozone layer. Now, almost 30 years later, the same fears have re-emerged as a result of research by the US National Oceanic and Atmospheric Administration at Boulder, Colorado. A research plane chasing Concorde has found that it produces an exhaust containing much sulphuric acid in the form of a very fine aerosol. The chlorine pollutants that destroy ozone do so on the surface of such particles.

A large fleet of supersonic aircraft could therefore have a serious effect on the ozone layer. So too, claim the researchers, might subsonic aircraft but the research has not yet been done.

Contact: NOAA, fax: +1 303 497 5126

First evidence that ozone hole harms Antarctic fish

Researchers from Northeastern University and the University of Texas in the United States have shown that increased ultraviolet light (UV-B) damages DNA in the eggs and larvae of Antarctic icefish. In *Proceedings of the National Academy of Sciences* (17 February 1996), the scientists report that icefish eggs accumulate significant levels of DNA lesions called cyclobutane pyrimidine dimers.

'We were surprised at the extent of the DNA damage we found,' said lead author Kirk Malloy, biologist at Northeastern, 'although we still need to know what happens during the rest of the year when the ozone hole closes up.'

'Ozone depletion has previously been shown to harm one-celled marine plants in Antarctica. We've now documented significant damage at a higher level of the food chain,' said William Detrich, a Northeastern biologist who coauthored the paper. 'It is striking how closely the damage to the fish eggs tracked with the increased intensity of ultraviolet light.'

Contact: Northeastern Biology Department,
fax +1 617 373 3724

Questions and answers: what is the significance of the 1999 freeze?

Question: *why is the 1999 freeze important for developing countries?*

Answer: It is the first of a number of reductions and phase outs under the Montreal Protocol, including its London and Copenhagen amendments, that affect Article 5 countries (broadly, the developing countries). It will require these countries to freeze their consumption of the 10 CFCs listed in annex A of the Protocol at their average consumption levels during 1995–97.

Question: *will this be followed by further restrictions?*

Answer: Yes—as the table on the right shows, most subsequent restrictions will affect Article 5 countries; consumption of halons will be frozen in the year 2002, annex B CFCs and methyl chloroform consumption will be affected the following year, and so on.

Question: *how can Article 5 countries meet these deadlines in time?*

Answer: By preparing and implementing their country programmes which will outline the steps needed to meet all the requirements of the Montreal Protocol. Most countries have developed or are developing these programmes. Those that have not yet done so should immediately contact the OzonAction Programme.

Contact: UNEP IE OzonAction Programme

fax: +33 1 44 37 14 74;

e-mail: ozonaction@unep.fr

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

ODS reduction and phase-out dates

● Article 5 countries ● non-Article 5 countries

1 July 1989	● freeze of annex A ¹ CFCs
1 January 1992	● freeze of halons
1 January 1993	● annex B CFCs ² reduced by 20% from 1989 levels ● freeze of methyl chloroform
1 January 1994	● annex B CFCs reduced by 75% from 1989 levels ● annex A CFCs reduced by 75% from 1986 levels ● halons ³ phased out ⁶ ● methyl chloroform reduced by 50%
1 January 1995	● methyl bromide frozen at 1991 levels ● carbon tetrachloride reduced by 85% from 1989 levels
1 January 1996	● HBFCs ⁶ phased out ⁴ ● carbon tetrachloride phased out ⁶ ● annex A and B CFCs phased out ⁶ ● methyl chloroform phased out ⁶ ● HCFCs ⁵ frozen at 1989 levels of HCFC + 2.8% of 1989 consumption of CFCs (base level)
1 July 1999	● freeze of annex A CFCs at 1995–97 average levels
1 January 2001	● methyl bromide reduced by 25%
1 January 2002	● freeze of halons at 1995–97 average levels ● freeze of methyl bromide at 1995–98 average levels
1 January 2003	● annex B CFCs reduced by 20% from 1998–2000 average consumption ● freeze in methyl chloroform at 1998–2000 average levels
1 January 2004	● HCFCs reduced by 35% below base levels
1 January 2005	● annex A CFCs reduced by 50% from 1995–97 average levels ● halons reduced by 50% from 1995–97 average levels ● carbon tetrachloride reduced by 85% from 1998–2000 average levels ● methyl chloroform reduced by 30% from 1998–2000 average levels ● methyl bromide reduced by 50%
1 January 2007	● annex A CFCs reduced by 85% from 1995–97 average levels ● annex B CFCs reduced by 85% from 1998–2000 average level
1 January 2010	● HCFCs reduced by 65% and methyl bromide phased out ● 100% phase out of CFCs, halons and carbon tetrachloride ● methyl chloroform reduced by 70% from 1998–2000 average levels
1 January 2015	● HCFCs reduced by 90% ● 100% phase out of methyl chloroform
1 January 2016	● freeze of HCFCs at baseline figure of year 2015 average levels
1 January 2020	● HCFCs phased out allowing for a service tail of up to 0.5% until 2030
1 January 2040	● HCFCs phased out

¹ Five CFCs in annex A: CFCs 11, 12, 113, 114 and 115 ² Ten CFCs in annex B: CFCs 13, 111, 112, 211, 212, 213, 214, 215, 216 and 217 ³ halons 1211, 1301 and 2402 ⁴ 34 hydrobromofluorocarbons ⁵ 34 hydrochlorofluorocarbons ⁶ with exemptions for essential uses

Ozone leadership organizations announce climate protection

The Electronics Industry Association of Japan (EIAJ) announced a new 'Voluntary Action Plan by the Electronic Device Industry on Reduction of PFC Emissions' in Tokyo during the Japan-US Environmental Leadership Workshop held 2–4 April 1997.

Perfluorocarbons (PFCs) are often used to replace ODS in the manufacture of semiconductors and other electronic devices, and are among the most potent greenhouse gases. At present, no substitutes are known for this chemical which is especially useful in the semiconductor industry.

This plan is regarded as comparable to the voluntary measures taken by the US

EPA and some semiconductor industry partners to reduce other emissions. It is expected that the Framework Convention on Climate Change will use industry leadership to achieve its aims, as did the Montreal Protocol for the Protection of the Ozone Layer. It is anticipated that this action will encourage other European and Asian semiconductor industries to support similar voluntary actions to reduce PFC emissions in ways that are less expensive, quicker and potentially environmentally more friendly than traditional regulatory approaches.

This workshop was sponsored by the Japan Industrial Conference for Ozone

Layer Protection (JICOP), Japan Electrical Manufacturers' Association (JEMA), EIAJ, Japan Automobile Manufacturers' Associations (JAMA), Japan Refrigeration and Air-Conditioning Industry Association (JRAIA), Japan Fluorocarbon Manufacturers' Association (JFMA), Federation of Electric Power Companies (FEPC), The International Cooperative for Environmental Leadership (ICEL), and the University of Maryland. It was supported by the Japan Ministry of International Trade (MITI), the US EPA, and UNEP IE.

Contact: JICOP, fax: +81 03 5689 7983
US EPA, fax: +1 202 233 9576

Status of Ratification

(as at 31 March 1997)

The Vienna Convention

164 Parties; new Parties: Burundi

The Montreal Protocol

162 Parties; new Parties: Burundi

The London Amendment

114 Parties; new Parties: Czech Republic, Ukraine

The Copenhagen Amendment

65 Parties; new Parties: Croatia, Czech Republic

Reclassification

Georgia, Article 5 country;
Brunei Darussalam, non-Article 5 country

Forthcoming meetings

The 1997 Halon Options Technical Working Conference (HOTWC), Albuquerque, New Mexico, United States, 6–8 May 1997

8th Global Warming International Conference and Expo, New York, N.Y. United States, 26–29 May 1997

22nd Meeting of the Executive Committee of the Multilateral Fund, Nairobi, Kenya, 28–30 May

UNEP Refrigeration Technical Options Committee, Geneva, Switzerland, 30–31 May 1997

15th Meeting of the Open-ended Working Group, Nairobi, Kenya, 3–6 June 1997

Refrigeration Technical Options Committee, Paris (Ecole des Mines), France, 9–10 June 1997

UNEP Technology and Economic Assessment Panel Meeting, Montreal, Canada, September 1997

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

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

World policy round-up

Cameroon bans imports of refrigerators and freezers that use CFCs

Cameroon's Ministry of Industry and Trade is banning importation of all refrigerators and freezers that use CFCs. The Ozone Office said the ban was necessary because the stockpiles of equipment that uses CFCs that cannot be sold in developed countries were being dumped in Africa

Cameroon also plans to introduce regulatory initiatives to protect the ozone layer and is already working to increase public awareness of the ozone issue: for example, the National Ozone Office of the Ministry of Environment and Forests is giving away free vehicle stickers that state 'I Love Life, So I Protect the Ozone Layer'.

Contact: Ministère de l'Environnement et des Forêts, fax: +237 21 53 61

EU ecolabels for environment-friendly refrigerators and freezers

The European Commission has announced that refrigerator and freezer manufacturers which produce energy-efficient machines, and refrain from using ODS and only apply low GWP chemicals, may receive EU ecolabels on their products.

The logo, a stylized letter 'E' surrounded by a flower with the EU's 12 stars as petals, may be used only after the EU verifies that a product meets specified energy efficiency and environmental requirements. Refrigerators using ODS as refrigerants or in the manufacture of the insulation will not be permitted to display the label.

Contact: EC DGXI, fax: (32) 2 29 69 559

India: incentives for ODS phase out projects

The Government of India has, with effect from 1 March 1997, exempted companies making new investments in non-ODS technologies from paying Customs and Excise duties.

Contact: Ministry of Environment and Forests, India

China and United States agree on standards

The US Air Conditioning and Refrigeration Institute (ARI) and the China Refrigeration and Air Conditioning Industry Association (CRAA) have concluded a Memorandum of Understanding which allows CRAA to

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.

use ARI standards to develop similar standards in the People's Republic of China. The agreement is intended to encourage harmonization of US and Chinese standards for heating, ventilation, air conditioning and refrigeration equipment. CRAA has already indicated that it will use ARI rating conditions as it develops standards for the Chinese market.

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

Fiji gears up for ozone action

Fiji has published its 1997 ODS Act which establishes the legal and administrative structures needed to protect the ozone layer by regulating the importation, storage and use of ODS. The Act enables these structures to formulate an integrated policy and implementation programme for the management of ODS as well as to facilitate the establishment of an effective management system for the recapture and recycling of ODS.

Contact: ODS Officer, fax: +679 312879

Recent publications

GTZ. *Hydrocarbon Technology II* (GTZ Yearbook 1996). Eschborn, 1996, Germany

Alternatives to Methyl Bromide, (Volume 2). Ten case studies, US EPA, December 1996.

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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