



View point

Maintaining the vision



Ambassador
Richard Benedick,
USA

Ten years ago, when just 24 nations signed the Montreal Protocol, none of us could imagine what lay ahead. The ozone treaty was later described by the heads of WMO and UNEP as 'one of the great international

achievements of the century'. Given the danger to life on Earth and the level of international cooperation that was mobilized to save the ozone layer, few observers would challenge this assessment.

Because the science was uncertain, we designed the treaty to be modified as increased understanding was gained of what was occurring, as well as of the technological, economic and environmental implications. We required periodic assessments by independent experts—an innovation that made the Protocol a dynamic, evolving process rather than a static instrument. But no-one foresaw that new threats to the ozone layer would cause the treaty to be revised again and again, expanding the list of controlled chemicals from 8 to more than 90, and consistently advancing phase-out schedules. Against heavy odds, the protocol achieved its aim of virtual universality when more

than 160 nations became Parties.

The Protocol has become a paradigm for new approaches in other international accords. Its first-ever multilateral environment fund promoted earlier phase outs by developing countries than required. Its emphasis on market instruments unleashed a surge of technological innovation previously considered impossible. It stimulated unprecedented cooperation among governments, international agencies, private business and citizens organizations. Its sensitive non-compliance procedure encouraged Parties to live up to 'the spirit of the Protocol'.

In the realm of international relations, there will always be resistance to change and there are always uncertainties—scientific, political, economic, psychological. Perhaps the greatest significance of the Montreal Protocol is that it demonstrated that the international community of nations *is* capable of undertaking bold preventative actions in this real world of ambiguity and imperfect knowledge. We all share a responsibility to maintain this vision.

The author was chief US negotiator and an original signer of the Montreal Protocol in 1987. He is now with the World Wildlife Fund, USA. A new and enlarged version of his book Ozone Diplomacy (Harvard University Press) is to be released in January 1998.

THE 1999 FREEZE IN PRODUCTION AND CONSUMPTION OF CFCs IN DEVELOPING COUNTRIES

20 months to go

9th Meeting of the Parties strengthens controls on MeBr and illegal trade

The 9th Meeting of the Parties to the Montreal Protocol took place in Montreal, Canada, 15–17 September 1997. It was attended by some 800 participants including representatives of 119 governments who agreed a phase-out schedule for methyl bromide. It was also agreed that the parties shall set up a licensing system to help

governments track international trade in CFCs and other controlled substances and discourage illegal sales.

The Meeting was preceded by the 16th Open-ended Working Group (OEWG) which prepared for the Meeting from 9–12 September. The MOP also marked the tenth anniversary of the

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Editorial Board: Mrs J. Aloisi de Larderel, Dr S. Andersen, Dr S. Carvalho, Dr O. El-Arini, Mr D. Stirpe, Mr P. Horwitz, Dr M. Kerr, Mrs I. Kökeritz, Dr L. Kuijpers, Mr G. Nardini, Mr K. M. Sarma, Mr R. Shende, Mr M. Verhille, Mr J. Whitelaw, Mr Liu Yi

Editor: Robin Clarke

Publication Manager: Ms Cecilia Mercado

Editorial Assistant: Mr Jim Curlin

UNITED NATIONS ENVIRONMENT PROGRAMME
INDUSTRY AND ENVIRONMENT (UNEP IE)

OZONACTION PROGRAMME

Tour Mirabeau

39–43 Quai Andre Citroën

75739 Paris Cedex 15, France

TEL: +33 1 44 37 14 50

FAX: +33 1 44 37 14 74

TELEX: 204 997 F

CABLE: UNITERRA PARIS

E-MAIL: ozonaction@unep.fr

On-line version at <http://www.unepie.org/ozonaction.html>

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News from international agencies



Fund Secretariat

The Fund Secretariat completed business arising from the 22nd meeting of the Executive Committee (ExCom) and

held a coordination meeting with the implementing agencies 20–21 August 1997. It also organized meetings of the Sub-Group on the Production Sector, the Sub-Committee on Monitoring, Evaluation and Finance, and the Sub-Committee on Project Review, which were held back-to-back with the 9th Meeting of the Parties (see page 1). The meetings examined draft guidelines for compensating the closure of ODS-producing plants in Article 5 countries, the proposed monitoring and evaluation system for the Multilateral Fund and the proposed plan for halon phase out in China. The Secretariat contributed to the 10th Anniversary Colloquium, a workshop on hydrocarbon technologies, the round-table discussion on technology transfer and a workshop on guidelines for refrigerant management plans, all held over the same period.

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: secretariat@unmfs.org



UNEP IE OzonAction Programme

The annual meeting of the ODS Officers

Network for Southeast Asia and the Pacific was held in Kuala Lumpur 4–8 August and a joint meeting of the French and English-speaking African network was held in Botswana, August 26–28 (see page 7).

The programme participated in the Technology Showcase for the 10th Anniversary Celebrations of the Montreal Protocol which coincided with the 9th Meeting of the Parties. A roundtable discussion was held on new industry initiatives to meet the 1999 freeze through technology cooperation. A number of publications were released to commemorate the anniversary (see page 9), including a joint publication with the Japan Industrial Conference for Ozone Layer Protection entitled *Technologies to Protect the Ozone Layer: case studies on the Japanese Experience*.

The Programme also awarded Certificates of Recognition to 12 outstanding National Ozone Units and

eight industry associations (see page 6). New posters and a video were disseminated to Article 5 countries for their celebrations of International Ozone Day.

Contact: Mrs Jacqueline Aloisi de Lardere, UNEP IE, 39–43 quai André Citroën, 75739 Paris Cedex 15, France
Tel: +33 1 44 37 14 50 Fax: +33 1 44 37 14 74
E-mail: ozonaction@unep.fr
Internet: <http://www.unepie.org/ozonaction.html>



UNEP Ozone Secretariat

The Secretariat serviced the 15th and 16th Meetings of the OEWG,

and meetings of the Bureau of the Montreal Protocol (8 September), the Implementation Committee (8 and 10 September) and the Legal Drafting Group (8–17 September).

The Secretariat also finalized the Report of the 9th Meeting of the Parties which includes three decisions to adjust the Protocol and one decision to amend it to establish licensing systems to assist Governments in tracking international trade in controlled substances and discourage their illegal sales.

The Secretariat attended five workshops of ODS officers in Africa and one in Bahrain. It also attended the Steering Committee Meeting of the Network for the Detection of Stratosphere Change (NDSC), Norway 25–27 August; the Conference of International and Comparative Law, Côte d'Ivoire 4–7 September; and the Meeting of the Committee on Trade and Environment of the World Trade Organization, Geneva 22–23 September.

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



UNDP

During 15 June–31 August, UNDP completed 17 investment projects/sub-projects in Brazil, India, Malaysia, Mexico and the Philippines which eliminated 733 ODP tonnes/annum in the foams and solvents sectors; among the completed projects was the first using liquid carbon dioxide as a replacement technology for CFC-11 (in Morocco). By the end of August 1997, UNDP had completed 99

investment projects/sub-projects eliminating 5247 ODP tonnes/annum. UNDP staff and consultants visited China in August to discuss updating the country programme and the solvents sector strategy. The UNDP booth at the 9th Meeting of the Parties featured an 'all-hydrocarbon' refrigerator manufactured by Guandong Kelon company in China under a UNDP project funded by the Multilateral Fund.

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

Of UNIDO's on-going projects, 10 companies have now phased out a total of 183 ODP

tonnes/annum in completed projects. In Barbados, recovery and recycling equipment has been delivered and training provided; in Egypt a refrigeration company has converted to HFC-134a as refrigerant and to cyclopentane as a foam-blowing agent; and in Tunisia another company has converted to water-blown systems for producing foams for furniture.

UNIDO participated in the Inter-agency Coordination Meeting held in Montreal in August and in the first joint workshop of anglophone and francophone ODS Officers in Africa. It also participated in the celebration of the 10th anniversary of the Montreal Protocol in Montreal.

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



World Bank

By July 1997, World Bank investment projects funded by the Multilateral Fund had phased out nearly

15 000 tonnes/annum of controlled substances. This is about 8 percent of what developing countries consume as a whole. When completed, the Bank's total portfolio will have phased out 30 percent of developing country consumption.

(Note: report for the period July to October was not available at the time of going to press.)

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

Phase-out successes under the Multilateral Fund

Morocco uses CO₂ to replace ODS in foam blowing

Approved in October 1996 and completed in June 1997, a UNDP project in Morocco (MOR/FOA/20/INV/04) has eliminated the use of 13 tonnes/annum of CFC-11 in the manufacture of integral skin and cold-cured moulded foam products at Maghreb Elastoplast. This is the first time liquid carbon dioxide has been used as a CFC-11 replacement in the foam industry in a project funded by the Multilateral Fund (US\$120 000).

Contact: UNDP, fax: +1 212 906 6947

Mexican project eliminates 306 tonnes/annum of CFC-11

A UNDP project in Mexico (MEX/FOA/19/INV/46) has eliminated 306 ODP tonnes/annum at the country's Multypanel company which manufactures insulated construction panels and doors. The project, which was funded by the Multilateral Fund (US\$428 000) uses HCFC-141b to replace CFC-11 as an interim solution; the company is to finance

the final conversion to a non-ODS blowing agent itself. The project was approved in May 1996 and completed by August 1997. Contact: UNDP, fax: +1 212 906 6947

Ghana's success recorded in print

The ways in which Ghana has managed to meet the requirements of the Montreal Protocol ahead of time are described in a new publication called *Ghana's Success Story: surpassing the Montreal Protocol objectives*.

(National Ozone Unit, Environmental Protection Agency, Ghana, September 1997). Copies can be obtained from UNEP IE.

Contact: National Ozone Unit, Ghana, fax: +233 21 6626 90/6673 74 E-mail: epainfo@incs.com.gh



Completed Investment Projects under the Multilateral Fund (as of 31 December 1996)

	foams	refrigeration	halons	aerosols	solvents	multi-sector	production sector	total number	total ODP tonnes
World Bank	20	24	1	2	17	1	5	70	13 168
UNDP	44	6	0	3	8	0	0	61	3560
UNIDO	3	9	1	0	5	0	0	18	3517

Number of projects by country: Algeria, 2; Argentina, 7; Bolivia, 1; Brazil, 2; Cambodia, 11; Cameroon, 1; Central Africa, 1; Chile, 6; China, 4; Colombia, 1; Costa Rica, 2; Congo, 1; Cuba, 1; Dominican Republic, 1; Egypt, 14; Ghana, 1; Guatemala, 1; India, 9; Indonesia, 5; Iran, 1 (partially completed); Jamaica, 1; Malaysia, 24; Malawi, 1; Mauritius, 3; Mexico, 9; Nigeria, 1; Pakistan, 1; Panama, 1; Philippines, 7; Romania, 1; Syria, 2; Thailand, 5; Turkey, 3; Uganda, 1; Uruguay, 9; Venezuela, 7; Vietnam, 1; Zambia, 2; Zimbabwe, 2

Industry and technology updates

AEROSOLS AND MISCELLANEOUS USES

New asthma medication approved

The US Food and Drug Administration (FDA) has approved Astra's new anti-inflammatory asthma medication Pulmicort Turbuhaler. The inhaler, the first corticosteroid dry powder inhaler to be approved in the United States, is based on budesonide and is an alternative to MDIs using CFCs as propellant. Pulmicort has been used in Europe, Australia and Canada for some time.

Contact: Astra, tel: +1 617 756 5392

FOAMS

HFC-365mfc shows promise

Research by Elf Atochem in France and a number of other companies worldwide suggests that HFC-365mfc may be a promising substitute for HCFC-141b (itself a substitute for CFC-11). The liquid has been used for blowing polyurethane foams and, because of its high boiling

Polyurethane foam characteristics

	blowing agent	
	HCFC-141b	HFC-365mfc
density (kg/m ³)	34.9	36.4
compressive strength (kPa)	227	238
closed cells (%)	80.5	78.9
burning rate (cm/min)	5.3	5.6
thermal conductivity (mW/m.K)	20.7	23.5

point (40°C), may also find uses as a substitute for the solvent HCFC-141b. Foams blown with HFC-365mfc have broadly comparable characteristics to those blown with HCFC-141b (see table). Further tests are being carried out on the compound's toxicity and environmental impact. HFC-365mfc is 1,1,1,3,3-pentafluorobutane (CF₃CH₂CF₂CH₃).

Under the Montreal Protocol HCFC-141b is to be phased by 2020 in developed countries and by 2040 in

developing countries; the European Union (EU) has elected for 2015 and the United States for 2003.

Contact: Elf Atochem, fax: +33 1 47 59 14 63

REFRIGERANTS

Cooling tractor drivers without refrigerant

Climatop 2, produced by the French firm AEREL, is a new system for cooling the cabins of agricultural equipment and



Hot work made cooler without CFCs or HFCs—agricultural and public service vehicles can be cooled without ODS.

public service vehicles. It relies on a system which draws in hot, dry air from the atmosphere, and purifies and humidifies it. Evaporation then produces a cooling effect. Tests carried out by the French energy agency Ademe showed that the cabin temperature of a combine harvester equipped with the system was at least 8°C cooler than that of an uncooled cabin and humidity was much higher. The energy efficiency of the system is estimated to be three times higher than a conventional air-conditioning system using refrigerants. (Note: such systems are already in use to cool enclosed spaces in hot and dry climates.)

Contact: AEREL, fax: +33 2 43 35 59 37

German firm installs propylene system

The German firm Linde AG, based in Cologne, has installed a refrigeration system using the propylene (R-1270) in a supermarket in Bad Freienwalde. The plant supplies the display space in the supermarket via heat exchangers and secondary pumped circuits using glycol as the heat transfer medium. The total refrigerant charge was only 17 kg, compared to the 400 kg of R-404a (a blend of R-125, R-143a and R-134a) that would have been needed for a direct expansion system. As with ammonia and propane systems, safety regulations required mechanical ventilation of the plant room and the use of leak detectors. Linde is planning the installation of more propylene-based systems.

Contact: Linde, fax: +49 611 770 269

Swedish supermarket giant switches to hydrocarbon refrigerant

The 3000 m² AGs Favor supermarket in Helsingborg, Sweden, uses only 35 kg of hydrocarbon refrigerants to cool its entire range of 140-kW freezers and 240-kW coolers. Seven units using semi-hermetic



One of the coolers in the 3000 m² AGs Favor supermarket in Helsingborg, Sweden, now dependent on hydrocarbon refrigerants.

compressors and plate heat exchangers supply the plant, which cools two kinds of secondary refrigerant: carbon dioxide for the freezers and propylene glycol for the coolers. The CARE™ refrigerants were supplied by Calor Gas Refrigeration.

The system was installed by ABB Stal-Litzell AB which has also installed hydrocarbon-based systems in supermarkets in Lund and in Landskrona. In the Lund supermarket, 14 kg of hydrocarbon refrigerant were used to replace R-404a; at the same time cooling capacity was increased by 30 kW and freezing capacity by 10 kW.

Contact: Calor, fax: +44 1926 318706
e-mail: care@calorgas.co.uk

METHYL BROMIDE

Patent awarded for dessiccant system

The US Patent Office has awarded Engelhard/ICC a patent for its dessiccant climate control system for killing airborne bacteria. The system works by drawing air through a dessiccant rotor which removes its moisture, causing a drop in vapour pressure and a rapid rise in temperature. The company claims that this occurs over a period of about 0.1 seconds, killing an average of 64 and 72 percent of airborne

ARI releases data and testing results

The Air-conditioning and Refrigeration Institute (ARI) in the United States has released a set of 97 reports and briefing packets accumulated as a result of testing, reporting and data sharing in the Alternative Refrigerants Evaluation Program (AREP). AREP is an international cooperative effort involving companies from North America, Europe and Asia. Initially focused on the alternatives HCFC-22 and R-502, the programme also covered practical experiences with new refrigerants and lubricants, data on optimized compressors and systems, and performance and reliability tests with immiscible lubricants and future refrigerants. The materials released also include thermophysical and other data. The material now available covers all the information collected from participants over the past two years.

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

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 25.

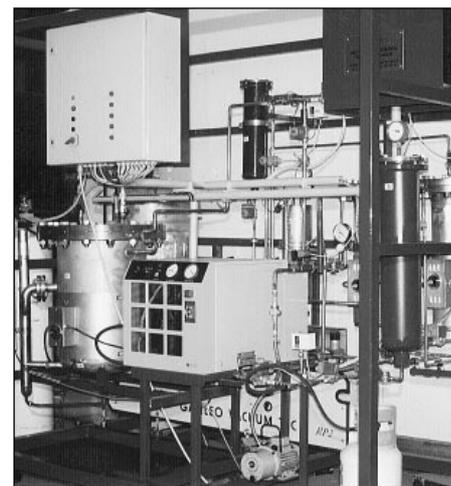
bacteria and fungi, respectively. The system is already commercially available and can act as an effective substitute for methyl bromide fumigation in critical applications in hospitals, laboratories and clean rooms.

Contact: ICC Technologies, tel: +1 215 682 6600

RECOVERY AND DESTRUCTION

New machines for recycling refrigerants

Hotar International Trading in Vienna, Austria, has announced the availability of two new recycling machines for small and medium-scale applications. The FRPDU-M-RU65 is a small machine for manual recycling and can handle 12–20 kg of refrigerants per hour. The FRPDU-A-RP.2 is a larger and automatic machine capable of separating up to 60 kg/hour. Both machines can handle a wide range of



Hotar's new FRPDU-A-RP.2 machine is capable of separating up to 60 kg/hour.

refrigerants and halons, including R-11, -12, -22 and -502. Minor modifications enable the machines to cope with R-134a, -404a and -407. Hotar is working on a new generation of machines capable of separating mixtures of different refrigerants and oil, which it hopes to be able to market in 1998.

Contact: Hotar, fax: +43 1 330 85 00

Firms pledge to help developing countries comply with the Montreal Protocol

As part of the 10th anniversary celebrations of the Montreal Protocol, the UNEP IE OzonAction Programme invited companies in the developed countries to pledge their support for the efforts of developing countries to meet the 1999 freeze. Despite the successes celebrated during the anniversary, there are still issues that threaten the Protocol, particularly the transfer of CFC-using technologies and equipment to developing countries. The pledge reads:

'Our company has phased out the production and consumption of CFCs to the greatest extent feasible in its global operations. We have encouraged our subsidiaries and joint partnerships to likewise phase out these substances.

Our company will not manufacture or sell any new CFC-using equipment or technology in developing countries or countries with economies in transition except CFCs produced under the Montreal Protocol essential use exemption.

We will endeavour to promote environmentally-friendly technologies in developing countries to assist them in meeting the 1999 freeze on CFCs.'

So far 19 companies have signed the pledge:

Bard Heating & Cooling Products	MagicAire (division of United Electric Company, L.P.)
Calmac Manufacturing Corporation	Manitowoc Ice, Inc
Carrier Corporation	McQuay International
Copeland	Nordyne
Crispaire Corporation	Outokumpu Copper Franklin, Inc
DuPont Fluoroproducts	Superior Valve Company
Emerson Electric Co	The Trane Company
Goettl Air Conditioning, Inc	Tyler Refrigeration Corporation
International Comfort Products Corporation	York International Corporation
Johnson Controls, Inc	

Other companies are invited to sign the pledge. Those wishing to do so should contact:

Mr Rajendra Shende, Coordinator, OzonAction Programme,
UNEP IE, 39-43 quai André Citroën, 75739 Paris Cedex 15, France

tel: +33 1 44 37 14 59 fax: +33 1 44 37 14 74

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

Plasma used to destroy ODS

Refrigerants that are too contaminated to be recycled are being destroyed at a destruction facility in Ichikawa City, near Tokyo, with an induction-coupled plasma torch. Exhaust gases from the plant include carbon dioxide (which is vented to the air) and hydrochloric and hydrofluoric acids which are neutralized with sodium hydroxide to yield calcium chloride and fluoride. The method was developed by researchers at Japan's Clean Japan Centre and has been used to destroy more than 70 tonnes of CFCs and HCFCs since December 1994.

Ichikawa Kankyou Engineering, Japan

SOLVENTS

New solvent from Japan

The Japanese firm Nippon Zeon, with assistance from the Ministry of International Trade and Industry (MITI), has developed a new solvent based on octafluorocyclopentane (OFCPA). It is claimed that the new solvent will have an ODP of zero, an atmospheric half-life of 4.7 years and a low GWP. OFCPA's five-ring structure distinguishes it from other CFC solvent substitutes. With a boiling point of 79°C, recycling losses are claimed to be low. The product is expected to find both cleaning and drying applications.

Contact: Nippon Zeus, fax: +81 33 216 0503

In brief ...

○ The Anti-fraud Unit of the European Commission has uncovered an illegal multi-million dollar scheme to import 1000 tonnes of CFCs from China to the EU and the United States. The Commission is now looking at ways of tightening up import regulations and is considering a ban on the sale and use of all CFCs in the EU.

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

○ UNEP has named Jan Van Der Leun of the Netherlands to the Global 500 Rôle of Honour for his analysis of the impact of ozone depletion on human and animal health.

Contact: UNEP Ozone Secretariat,
fax: +254 2 623 913; e-mail:
madhava.sarma@unep.org

○ A new survey shows that the rate of increase of melanoma has levelled off among women in New South Wales, Australia, indicating that the battle to contain the epidemic of skin cancer is beginning to be won in that region. No similar trend was observed for men.

4th World Conference on Melanoma

○ ICI and DuPont claim that they will not market HFC-134a to the manufacturers of self-chilled drinks (see OAN 23, p. 4). The European Fluorocarbon Technical Committee is urging the European Union to support a voluntary agreement banning the use of HFCs in self-chilling drink cans.

Contact: EFTC, fax: +32 2 676 7301
EC DGXI, fax: +32 2 29 69 559

○ AlliedSignals Fluorine Products Division has opened a new Web site devoted to fluorine-based refrigerants and foam-blowing agents.

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

10th anniversary celebrations in Montreal

The anniversary celebrations

An atmosphere of celebration and optimism was sustained throughout the activities held to celebrate the 10th anniversary of the Montreal Protocol in Montreal during 9–17 September. One of the main events was a Technology Exhibition that featured some of the



The 9th Meeting of the Parties in progress (lower left); boys choir (immediately left); and 10-year-old Genevieve Paré reading a poem about the ozone layer (right).



available alternative non-ODS technologies in the different sectors. Prominent among these were alternatives to methyl bromide, some of which were demonstrated *in situ*.

The ceremony held on 16 September to mark the actual day when the Protocol was originally signed by the first signatories was marked for its simplicity but included some touching moments. A boys' choir sang environmental songs, a young girl born in 1987 read a poem about the ozone

layer and a teenager expressed his personal views about the Protocol.

The photographs on this page feature some of the events that marked the 10th anniversary in Montreal. The awards given to individuals, industry associations and outstanding National Ozone Units are detailed below.

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>

Award winners

Global Ozone Award winners

For the 10th anniversary of the Montreal Protocol, UNEP has announced new Global Ozone Awards. The winners are:

Individuals and organizations

- James G. Andersen
- Jonathan Banks
- R. Benedick
- John Carstensen
- Suely M. Carvalho
- Ralph J. Cicerone
- Elizabeth Cook
- Edward C. De Fabo
- Paul Horwitz
- W. Kakebeeke
- Barbara Kucnerowicz-Polak
- Lambert Kuijpers
- Melanie Miller
- Ilkka Ristimäki
- S. Seebaluck
- Susan Solomon
- Richard Stolarski
- Robert C. Worrest
- Christos Zerefos
- Alliance for Responsible CFC Policy
- Department of Environment, Malaysia
- Greenpeace, Netherlands
- Northern Telecom

NOU Awards

Outstanding National Ozone Units

Awards were also given to those NOUs that have performed particularly well in their duties in relation to the Montreal Protocol:

- Burkina Faso
- Egypt
- Ghana
- Iran
- Malaysia
- Peru
- Philippines
- Singapore
- Tunisia
- Turkey
- Uruguay
- Venezuela

Special Certificates

Certificate of Recognition

awarded as a token of UNEP's appreciation for continuous support and assistance to the OzonAction Programme:

- Conseil Européen d'Industrie Chimique (CEFIC)
- Japan Industrial Conference for Ozone Protection (JICOP)
- Japan Electrical Manufacturers' Association (JEMA)
- The International Institute of Refrigeration (IIR)
- Halon Alternatives Research Corporation (HARC)
- International Cooperative for Environmental Leadership (ICEL)
- Air-conditioning and Refrigeration Institute (ARI)
- Alliance for Responsible Atmospheric Policy (ARAP)

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>

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

US EPA awards best-of-the-best in Montreal

The United States Environmental Protection Agency (US EPA) awarded Best-of-the-Best Stratospheric Ozone Protection Awards, for leadership, motivation, and technical innovation to individuals, industry associations, governments, corporations and military organizations.

Associations

Air Conditioning and Refrigeration Institute (ARI)
 Alliance for Responsible Atmospheric Policy (ARAP)
 Association of Fluorocarbon Consumers and Manufacturers (AFCAM)
 Halons Alternatives Research Corporation (HARC)
 International Cooperative for Ozone Layer Protection (ICOLP)/International Cooperative for Environmental Leadership (ICEL)
 IPC Electronics Cleaning Solvents Benchmarking Team
 Japan Electrical Manufacturers' Association (JEMA)
 Japan Industrial Conference for Ozone Layer Protection (JICOP)
 Mobile Air Conditioning Society Worldwide (MACS)

Individuals

Ward J. Atkinson • James A. Baker • Jay D. Baker • Jonathan Banks • Walter Brunner • Suely Machado Carvalho • David V. Catchpole • David Chittick • Jorge Corona de la Vega • Philip J. DiNenno • Stephen P. Evanoff • Kevin Fay • Joe R. Felty • Arthur FitzGerald • Yuichi Fujimoto • Kaichi Hasegawa • Andrea L. Hinwood • Michael Jeffs • Margaret G. Kerr • Joel Krinsky •

Lambert Kuijpers • Colin Lea • Eduardo E. Lopez Perez • Mohinder Malik • Melanie Miller • John H. Minsker • Mario Molina • E. Thomas Morehouse, Jr. • David K. Mueller • Tsuneya Nakamura • Richard Nusbaum • Simon Oulouhojian • Jose Pons Pons • F. Sherwood Rowland • Ronald W. Sibley • Gary Taylor • Daniel P. Verdonik • Gary D. Vest • Masaaki Yamabe • Hideaki Yasukawa

Corporations, governments and military organizations

Asahi Glass Company • The Coca-Cola Company • DuPont Company • Hitachi • IBM Corporation • ICI • Lockheed Martin Corporation • Lufthansa German Airlines/Technik • Department of Environment, Malaysia • Minebea Group Companies • Mitsubishi Electric Corporation • Nissan • Nortel • Raytheon TI Systems • Seiko Epson Corporation • Thiokol • National Aeronautics and Space Administration (NASA) • 3M Corporation • US Air Force Space Launch Programs • US Army Acquisition Pollution Prevention Support Office (AAPPSO) • US Department of Defense (DoD) • US Naval Research Laboratory • US Naval Surface Warfare Center

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

UNEP IE organizes round table on meeting the 1999 freeze in Montreal

As part of the Technology Showcase presentation, UNEP IE invited industries from developed and developing countries, government representatives and NGOs to a round table on how industries can work together to meet the 1999 freeze for CFCs in developing countries.

The round table evoked an overwhelming response from the invitees. The panel discussion identified barriers to meeting the freeze and suggested innovative mechanisms such as voluntary pledges, and discussed the increasing role of larger companies to assist their

suppliers and buyers, among others. The round table discussion was moderated by Ms Angie Shurig from Raytheon.

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

Network news

French and English speaking Africa ODS officers agreed that a similar approach August The meeting was hosted by the

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_12723

