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ПРОГРАММА ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ ПО ОКРУЖАЮЩЕЙ СРЕДЕ

August, 2003

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BACKGROUNDER

Basic Facts and Data on the Science and Politics of Ozone Protection

1. The Ozone Layer

Ozone molecules (O_3) consist of three oxygen atoms. This poisonous gas is extremely rare in the atmosphere, representing just three out of every 10 million molecules. Ninety per cent of ozone exists in the upper atmosphere, or stratosphere, between 10 and 50 km (6-30 miles) above the earth. Ozone at ground-level, at the bottom of the troposphere, is a harmful pollutant resulting from automobile exhausts and other sources.

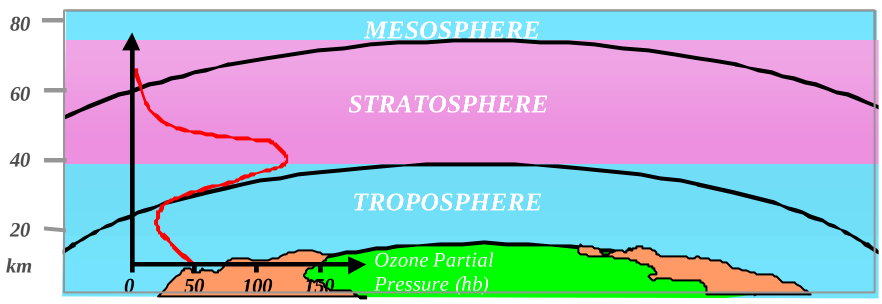

Figure 1 - Ozone Distribution in the Atmosphere

The ozone layer absorbs most of the harmful ultraviolet-B radiation from the sun. It also completely screens out lethal UV-C radiation. The ozone shield is thus essential to life as we know it. Depleting the ozone layer allows more UV-B to reach the earth. More UV-B means more melanoma and non-melanoma skin cancers, more eye cataracts, weakened immune systems, reduced plant yields, damage to ocean eco-systems and reduced fishing yields, adverse effects on animals, and more damage to plastics.

Scientific concern started in 1970 when Prof. Paul Crutzen pointed out the possibility that nitrogen oxides from fertilizers and supersonic aircraft might deplete the ozone layer. In 1974, Professors F. Sherwood Rowland and Mario J. Molina recognized that when CFCs finally break apart in the atmosphere and release chlorine atoms they cause ozone depletion. Bromine atoms released by halons have the same effect. The three scientists received the Nobel Prize for Chemistry in 1995 for their pioneering work.

The ozone layer over the Antarctic has steadily weakened since measurements started in the early 1980s. The problem is worst over this part of the globe due to the extremely cold atmosphere and the presence of polar stratospheric clouds. The land area under the ozone-depleted atmosphere increased steadily to more than 20 million sq km in the early 1990s and has varied between 20 and 29 million sq. km since then. In 2000, the area of the ozone hole reached a record 29 million sq. kilometers on 12 September 2000. Although it was the largest and the deepest ozone hole on record for the month of September, it dissipated early in October, the earliest since 1991. The lowest value recorded at the South Pole was 86 DU on 12 October 1993. This year, the area of the ozone hole has been about 25 million sq. km. While no hole has appeared elsewhere, the Arctic spring has seen the ozone layer over the North Pole thin by up to 30%, while the depletion over Europe and other high latitudes varies between 5% and 30%.

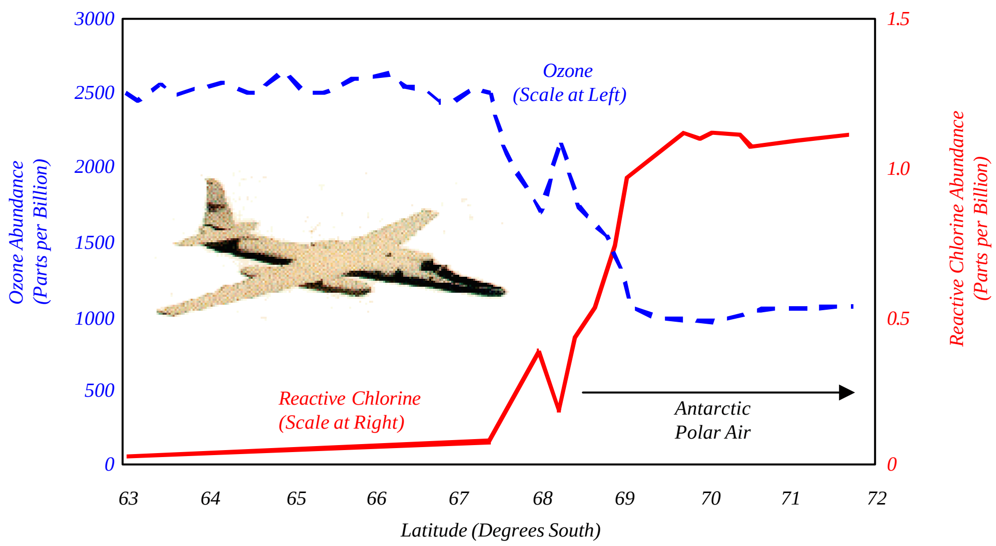

Figure 2 - Measurements of Ozone and Reactive Chlorine from a Flight Into the Antarctic Ozone Hole, 1987

2. Adopting and Ratifying the Vienna Convention, the Montreal Protocol, and Amendments to the Protocol

The issue of ozone depletion was first discussed by the Governing Council of the United Nations Environment Programme (UNEP) in 1976. A meeting of experts on the ozone layer was convened in 1977, after which UNEP and the World Meteorological Organization (WMO) set up the Coordinating Committee of the Ozone Layer (CCOL) to periodically assess ozone depletion. Inter-governmental negotiations for an international agreement to phase out ozone-depleting substances started in 1981 and concluded with the adoption of the Vienna Convention for the Protection of the Ozone Layer in March 1985.

The 1985 Vienna Convention encourages intergovernmental cooperation on research, systematic observation of the ozone layer, monitoring of CFC production, and the exchange of information. The Convention commits its Parties to take general measures to protect human health and the environment against human activities that modify the ozone layer. The Vienna Convention is a framework agreement and does not contain legally binding controls or targets.

The Montreal Protocol on Substances that Deplete the Ozone Layer was adopted in September 1987. Following the discovery of the Antarctic ozone hole in late 1985, governments recognized the need for stronger measures to reduce the production and consumption of a number of CFCs (CFC-11, 12, 113, 114, and 115) and several Halons (1211, 1301, 2402). The Protocol was designed so that the phase-out schedules could be revised on the basis of periodic scientific and technological assessments. Following such assessments, the Protocol was adjusted to accelerate the phase-out schedules in London in 1990, Copenhagen in 1992, Vienna in 1995, Montreal in 1997, and Beijing in 1999. It has also been amended to introduce other kinds of control measures and to add new controlled substances to the list; the 1990 London Amendment included additional CFCs (CFC-13, 111, 112, 211, 212, 213, 214, 215, 216, 217) and the two solvents (carbon tetrachloride and methyl chloroform), while the 1992 Copenhagen Amendment added methyl bromide, HBFCs, and HCFCs. The Montreal Amendment of 1997 finalized the schedules for phasing out methyl bromide. The Beijing Amendment of 1999 included Bromochloromethane for immediate phase out; it also introduced production controls on HCFCs as well as controls on trade with non-Parties.

Governments are not legally bound until they ratify the Protocol as well as the Amendments. Unfortunately, while most governments have ratified the Protocol, ratification of the amendments and their stronger control measures lag behind. As of 2 July 2003, the Ozone Agreements had been ratified by countries as depicted in the figure 3 chart:

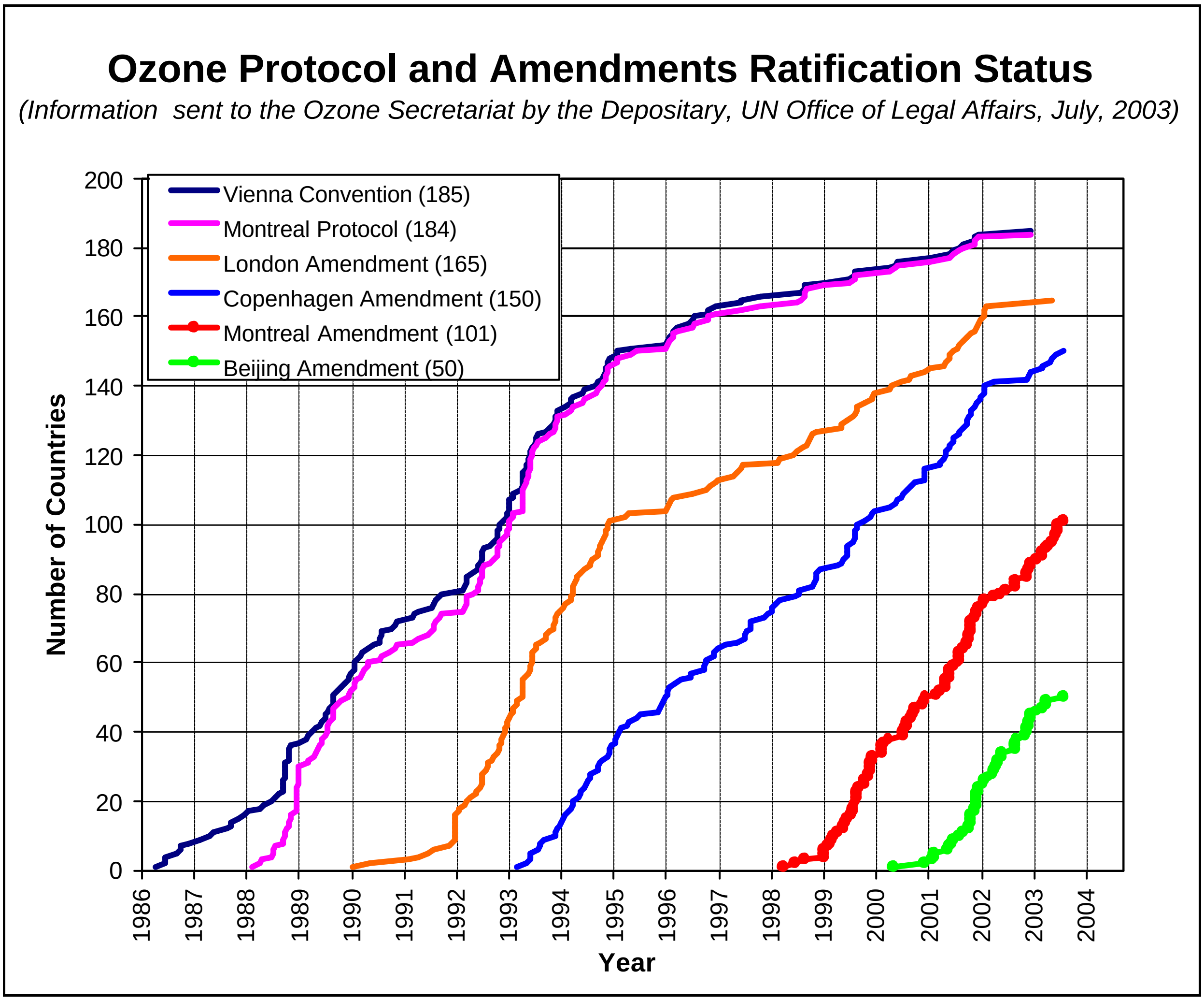

Figure 3 - Ratification Status of the Montreal Protocol and its Amendments as of July 2003.

3. The Chemicals And Their Phase-Out Schedules

Ninety-six (96) chemicals are presently controlled by the Montreal Protocol, including:

- ***Halo-carbons***, notably ***chlorofluorocarbons (CFCs)*** and ***Halons***. CFCs were discovered in 1928 and were considered wonder gases because they are long-lived, non-toxic, non-corrosive, and non-flammable. They are also versatile and from the 1960s were increasingly used in refrigerators, air conditioners, spray cans, solvents, foams, and other applications. CFC-11 remains in the atmosphere for 50 years, CFC-12 for 102 years, and CFC-115 for 1,700. Halon 1301 is used primarily in fire extinguishers and has an atmospheric lifetime of 65 years.
- ***Carbon tetrachloride*** is used as a solvent and takes about 42 years to break down in the atmosphere.
- ***Methyl chloroform*** (1,1,1-trichloroethane) is also used as a solvent and takes about 5.4 years to break down.
- ***Hydrobromofluorocarbons (HBFCs)*** are not widely used, but they have been included under the Protocol to prevent any new uses.
- ***Hydrochlorofluorocarbons (HCFCs)*** were developed as the first major replacement for CFCs. While much less destructive than CFCs, HCFCs also contribute to ozone depletion. They have an atmospheric lifetime of about 1.4 to 19.5 years.

- ***Methyl bromide (CH_3Br)*** is used as a fumigant for high-value crops, pest control, and quarantine treatment of agricultural commodities awaiting export. Total world annual consumption is about 70,000 tonnes, most of it in the industrialized countries. It takes about 0.7 years to break down.
- ***Bromochloromethane (BCM)***, a new ozone-depleting substance that some companies sought to introduce into the market in 1998, has been targeted by the 1999 Amendment for immediate phase-out to prevent its use.
- The Parties are considering measures to prevent the marketing of new ozone-depleting substances not so far covered by the Protocol.

The phase-out schedules for developed countries are as follows:

- Phase out Halons by 1994;
- Phase out CFCs, carbon tetrachloride, methyl chloroform, and HBFCs by 1996;
- Reduce methyl bromide by 25% by 1999, 50% by 2001, 70% by 2003, and phase out by 2005; and
- Reduce HCFCs by 35% by 2004, 65% by 2010, 90% by 2015, and 99.5% by 2020, with 0.5% permitted for maintenance purposes only until 2030.
- Phase out HBFCs by 1996 and phase out BCM immediately.

Developing countries have a grace period before they must start their phase-out schedules. This reflects the recognition that developed countries are responsible for the bulk of total emissions into the atmosphere and that they have more financial and technological resources for adopting replacements. The developing country schedules are as follows:

- Phase out HBFCs by 1996 and phase out BCM immediately;
- Freeze CFCs, Halons and carbon tetrachloride at average 1995-97 levels by 1 July 1999, reduce by 50% by 2005, 85% by 2007, and phase out completely by 2010;
- Freeze methyl chloroform by 2003 at average 1998-2000 levels, reduce by 30% by 2005, 70% by 2010, and phase out by 2015;
- Freeze methyl bromide by 2002 at average 1995-98 levels, reduce by 20% by 2005, and phase out by 2015; and
- Freeze HCFCs by 2016 at 2015 levels and phase out by 2040.

The phase-out schedules cover both the production and the consumption of the target substances. However, even after phase out both developed and developing countries are permitted to produce limited quantities in order to meet the essential uses for which no alternatives have yet been identified, e.g. the use of CFCs in metered dose inhalers for asthma. Production is defined as total production minus amounts destroyed or used as chemical feedstock. Consumption is defined as production plus imports minus exports. Trade in recycled and used chemicals is not included in the calculation of consumption in order to encourage recovery, reclamation and recycling.

4. What Have Been The Results So Far?

Without the Protocol, by the year 2050 ozone depletion would have risen to at least 50% in the northern hemisphere's mid latitudes and 70% in the southern mid latitudes, about 10 times worse than current levels. The result would have been a doubling of UV-B radiation reaching the earth in the northern mid latitudes and a quadrupling in the south. The amount of ozone-depleting chemicals in the atmosphere would have been five times greater. The implications of this would have been horrendous: 19 million more cases of non-melanoma cancer, 1.5 million cases of melanoma cancer, and 130 million more cases of eye cataracts.

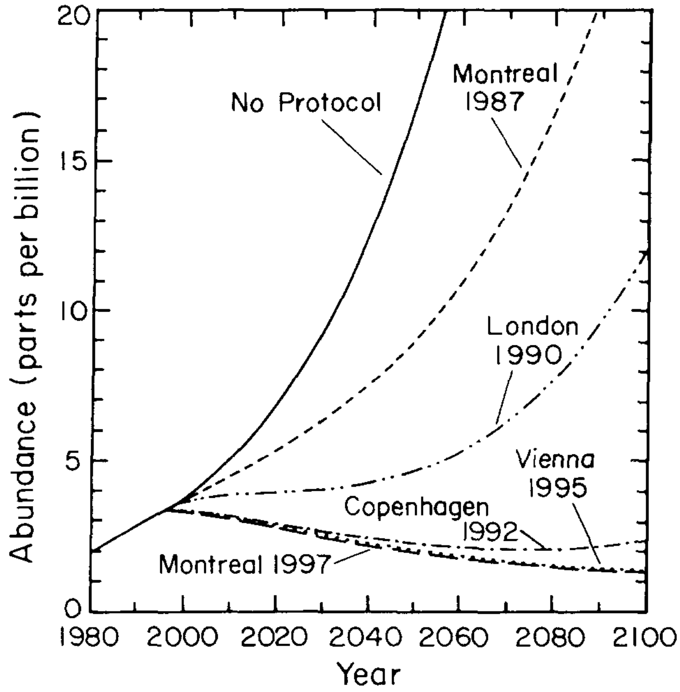

Figure 4.1 - Projection of what would have happened without the Protocol - Ozone Losses

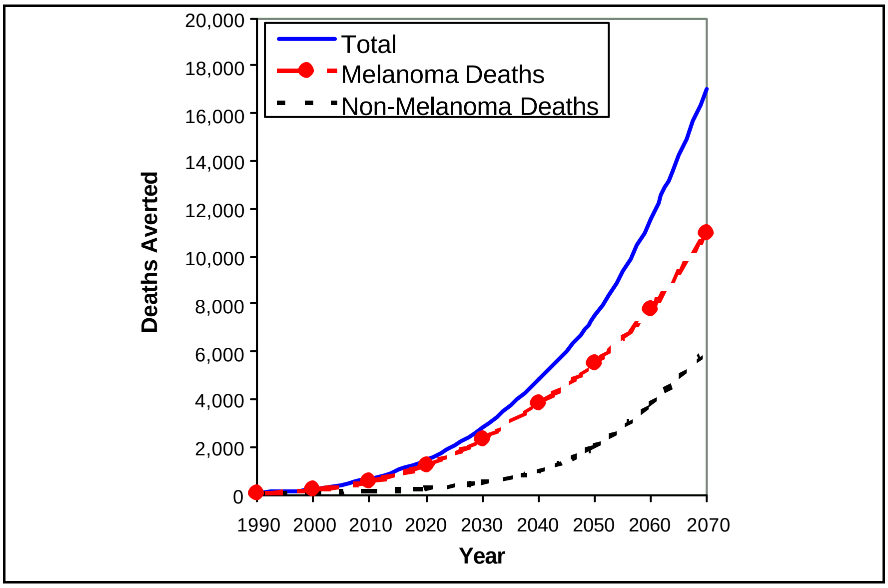

Figure 4.2 - Projections: Annual Deaths from Melanoma and Non-Melanoma Skin Cancer Averted due to the Montreal Protocol

In 1986 the total consumption of CFCs world-wide was about 1.1 million ODP tonnes; by 2001 this had come down to about 110,000 tonnes. It has been calculated that without the Montreal Protocol global consumption would have reached about 3 million tonnes in the year 2010 and 8 million tonnes in 2060, resulting in a 50% depletion of the ozone layer by 2035. The bulk of the 1986 total, or about 0.9 million ODP tonnes, was consumed in developed countries, but by 2001 these countries consumed just about 7,000 tonnes, including for exemptions approved by the Parties. The developing countries have reduced their CFC consumption by about 15% from 1986 to 2001. Three of the 130 developing countries (Brazil, China and Republic of Korea), accounted for about 46% of this group's consumption for 2001, while 8 more countries (Argentina, India, Indonesia, Iran, Mexico, Nigeria, Thailand and Venezuela), accounted for a further 28% consumption.

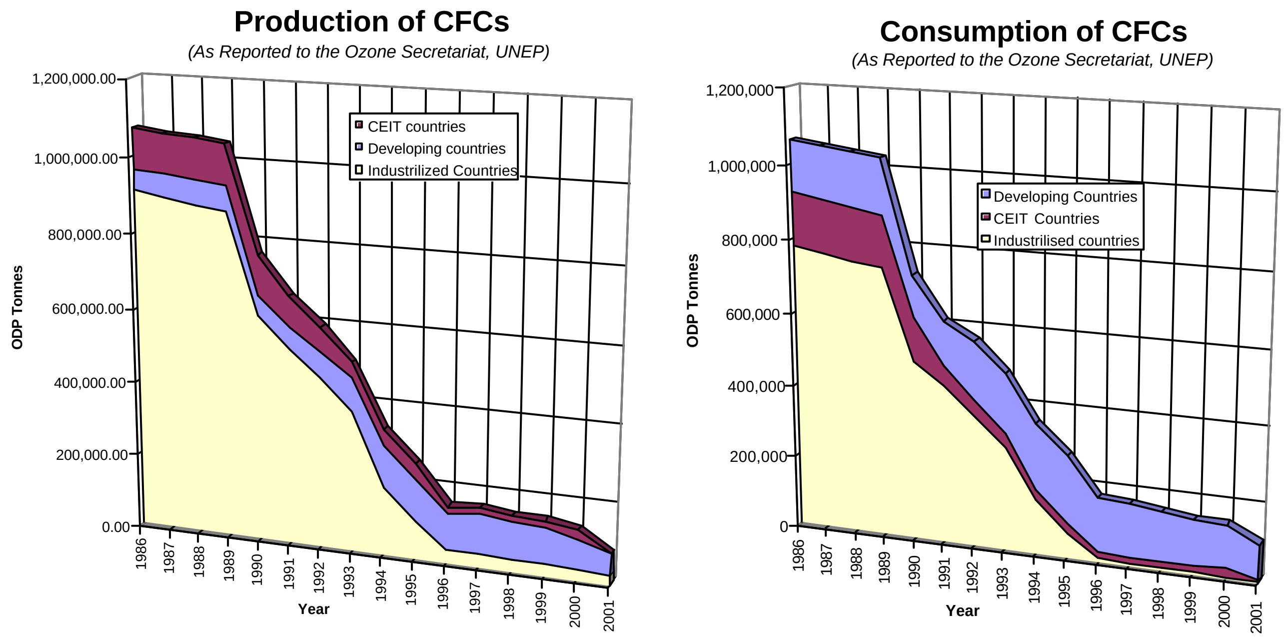

Figure 5 - Worldwide Production and Consumption of CFCs

Scientists predict that ozone depletion will reach its worst point during the next few years and then gradually decline until the ozone layer returns to normal around 2050, assuming that the Montreal Protocol is fully implemented. The ozone layer is currently in its most vulnerable state. Despite declining CFC *emissions*, stratospheric *concentrations* are still increasing (although they are declining in the lower atmosphere) because long-lived CFCs emitted in earlier years continue to rise to the stratosphere. The atmospheric abundance of certain CFCs (notably CFC-11 and CFC-113), carbon tetrachloride, and methyl chloroform is declining. The abundance of most of the halons continues to increase. Concentrations of HCFCs and HFCs are, of course, increasing, since they are used as substitutes for the CFCs that are being phased out.

The success of ozone protection has been possible because science and industry have been able to develop and commercialize alternatives to ozone-depleting chemicals. Developed countries ended the use of CFCs faster and with less cost than was originally anticipated. Substitutes have proved particularly important in electronics. The foam-blowing sector has made use of water, carbon-dioxide, and hydrocarbons, as well as HCFCs. The refrigeration and air-conditioning sector has largely used HCFCs as alternatives, but new equipment is increasingly using replacements with zero ozone-depleting potential, including hydrofluorocarbons (HFCs), ammonia, and hydrocarbons.

HFCs have a high global warming potential and have been included in the basket of greenhouse gases controlled by the Kyoto Protocol of the Convention on Climate Change. Countries are now trying to minimise their emissions of HFCs.

Consumers are recycling existing Halons to gain time for developing substitutes for fire fighting. Other extinguishing agents such as carbon dioxide, water, foam, and dry powder are now widely used. Alternative approaches, such as good fire prevention practices, use of fire-resistant materials, and appropriate designs for buildings have significantly reduced the need for Halon systems, and total phase-out was achieved smoothly by 1994.

Countries are recovering and recycling CFCs from obsolete equipment and using it for maintenance of existing equipment.

Industrialized countries are concentrating their phase-out efforts on HCFCs and methyl bromide. They are trying to ensure that HCFCs are used only as direct replacements where other more environmentally suitable alternatives are not available. HCFCs were critical for meeting the early CFC phase-out goals but are generally considered undesirable for most new equipment because they do have some ozone-depleting potential and ozone-safe alternatives are available for most applications.

5. A summary of the 2002 findings of the Assessment Panels

Science:

- The Montreal Protocol is working. However, even with full compliance of the Montreal Protocol by all Parties, the ozone layer will remain particularly vulnerable during the next decade or so.
- The total combined effective abundance of ozone-depleting compounds in the lower atmosphere continues to decline slowly from the peak that occurred in 1992-1994. Total chlorine is declining, while bromine from industrial halons is still increasing, albeit at a slower rate than was occurring previously. The abundances of HCFCs in the lower atmosphere are increasing.
- Observations in the stratosphere indic ate that the total chlorine abundance is at or near a peak, while bromine abundances are probably still increasing.
- Springtime Antarctic ozone depletion due to halogens has been large throughout the last decade. In some recent cold Arctic winters during the last decade, maximum total column ozone losses due to halogens have reached 30%. Ozone remains depleted in the midlatitudes of both hemispheres.
- The global ozone layer recovery has been linked mainly to decreasing chlorine and bromine loading. A return to pre-1980 total column ozone amounts in the Antarctic is expected by the middle of this century. Although Arctic ozone depletion is difficult to predict, a future Arctic polar ozone hole similar to that of the Antarctic appears unlikely.
- Very short-lived organic chlorine-, bromine-, and iodine-containing gases have the potential to deplete stratospheric ozone. Quantitative estimation of their ozone depleting potentials is challenging but they could vary up to 0.1. The impact of very short-lived compounds can be significant if their emissions are large.
- Other factors such as climate change and changes in atmospheric transport are likely to influence the recovery of the ozone layer. New research has begun to explore the coupling between climate change and the recovery of the ozone layer.

Environmental Effects:

- New studies continue to confirm the adverse effects of UV-B radiation on the eyes, skin, and immune system, including cortical cataract and skin cancer.
- Phase-out of the ozone-depleting chemical, methyl bromide, may lead to increased use and numbers of other pesticides which may lead to additional health risks.
- Interactions between global climate change and ozone depletion are likely to influence the risk of adverse effects of UV-B radiation on health.
- Interaction of ultraviolet radiation with other global climate change factors may affect many ecosystem processes such as plant biomass production, plant consumption by herbivores including insects, disease incidence of plants and animals, and changes in species abundance and composition.
- Recent results continue to confirm the general consensus that solar UV negatively affects aquatic organisms (zooplankton, as well as larval stages of primary and secondary consumers).
- In addition to increasing solar UV-B radiation, aquatic ecosystems are confronted with other environmental stress factors including increased nutrient input, pollution, acidification and global climate change.
- Global warming and enhanced UV-B radiation interact to affect a range of biogeochemical processes including microbial activity, nutrient cycling, and greenhouse gas emissions from soils.
- Interactions between ozone depletion and climate change will have an impact on tropospheric hydroxyl (OH) radical concentration, the "cleaning" agent of the troposphere.
- Climate change is likely to modify the rates of UV-induced degradation of natural and synthetic materials.

Technology and Economics:

- The remaining 7,000 ODP tonnes of CFCs used annually in MDIs for asthma/COPD can be phased out. The timing is difficult to predict, but it depends on the availability of affordable alternatives and the adoption and effectiveness of transition strategies by Parties.

- In the last four years there has been a substantial phase-out of CFCs in non-MDI aerosols and a complete phase-out for non-MDI aerosols is achievable. There are difficulties including the availability of hydrocarbon aerosol propellants, the conversion of small CFC users, and also the conversion of non-MDI pharmaceutical aerosols.
- Most miscellaneous uses have been phased out, whilst some laboratory uses still remain under a global exemption.
- The use of CFCs in foams has been reduced by over 90% since its peak in 1988 and HCFC use is also in decline from its peak in 2000. The phase-out of ODS in the foam sector has forced the industry to innovate faster than ever before. The first transition technology led to the introduction of substances such as HCFCs as well as the increasing use of hydrocarbons and other non-ODSs. Attention is now on the emerging HFC-based technologies as well as the further optimisation and use of hydrocarbon and CO2 technologies.
- Halon fire extinguishants are no longer necessary in virtually any new installations, with the possible exceptions of engine nacelles and cargo compartments on commercial aircraft and crew compartments of combat vehicles. The very high cost of replacing many existing halon systems with substitutes, replacements or other alternative fire protection measures continues to be a major impediment to eliminating continued use of halons.
- Production of methyl bromide (MB) for controlled uses was reported to be about 62,000 metric tonnes in 1998; it was reduced to at least 49,000 tonnes in 1999 and at least 46,000 tonnes in 2000. The decline in total global consumption of MB is attributed largely to reductions for soil fumigation. No existing technical alternatives for about 3,200 metric tonnes of MB per annum used for non-QPS treatments could be found yet.
- With two exceptions (control of ginseng root rot and stabilisation of high-moisture fresh dates), the completed demonstration projects identified one or more alternatives comparable to MB in their effectiveness in the control of targeted pests and diseases and demonstrated that a similar range of alternatives to those in developed countries can be successfully adopted.
- In the last decade, the refrigeration, air conditioning and heat pump industry made tremendous technical progress in phasing out CFCs and, in several applications, HCFCs as well. The mobile air conditioning and the domestic refrigeration industries have shifted rapidly from CFC-12 to non-ODS refrigerants. Other applications, such as chillers and commercial refrigeration, have shifted from CFCs to HCFCs, HFCs or other fluids. Worldwide, a significant amount of installed refrigeration equipment still uses CFCs and HCFCs. As a consequence, service demand for CFCs and HCFCs remains high.
- There is much left to be achieved in the Solvents Sector. Effort is still required to phase out ODS solvents in developing countries, and especially the small- and medium-sized users. In particular, there is concern about the use of carbon tetrachloride (CTC) for solvent applications by both large and small enterprises in some countries.

6. The Multilateral Fund of the Montreal Protocol and the GEF

The Multilateral Fund of the Montreal Protocol is part of the financial mechanism established under the Protocol in June 1990. It pays the agreed incremental costs incurred by developing countries in phasing out their consumption and production of ozone-depleting substances. It is administered by an Executive Committee of seven developed and seven developing countries chosen by the Parties every year. The Fund's allocation was $240 million for 1991-93, $455 million for 1994-96, $465 million for 1996-99 and $440 million for 2000-2. The replenishment for the three-year period of 2003-5 was fixed at $474 million by the Parties at their Rome meeting in November 2002. The Multilateral Fund has thus far disbursed over 1.4 billion dollars for capacity building and projects to phase out CFCs.

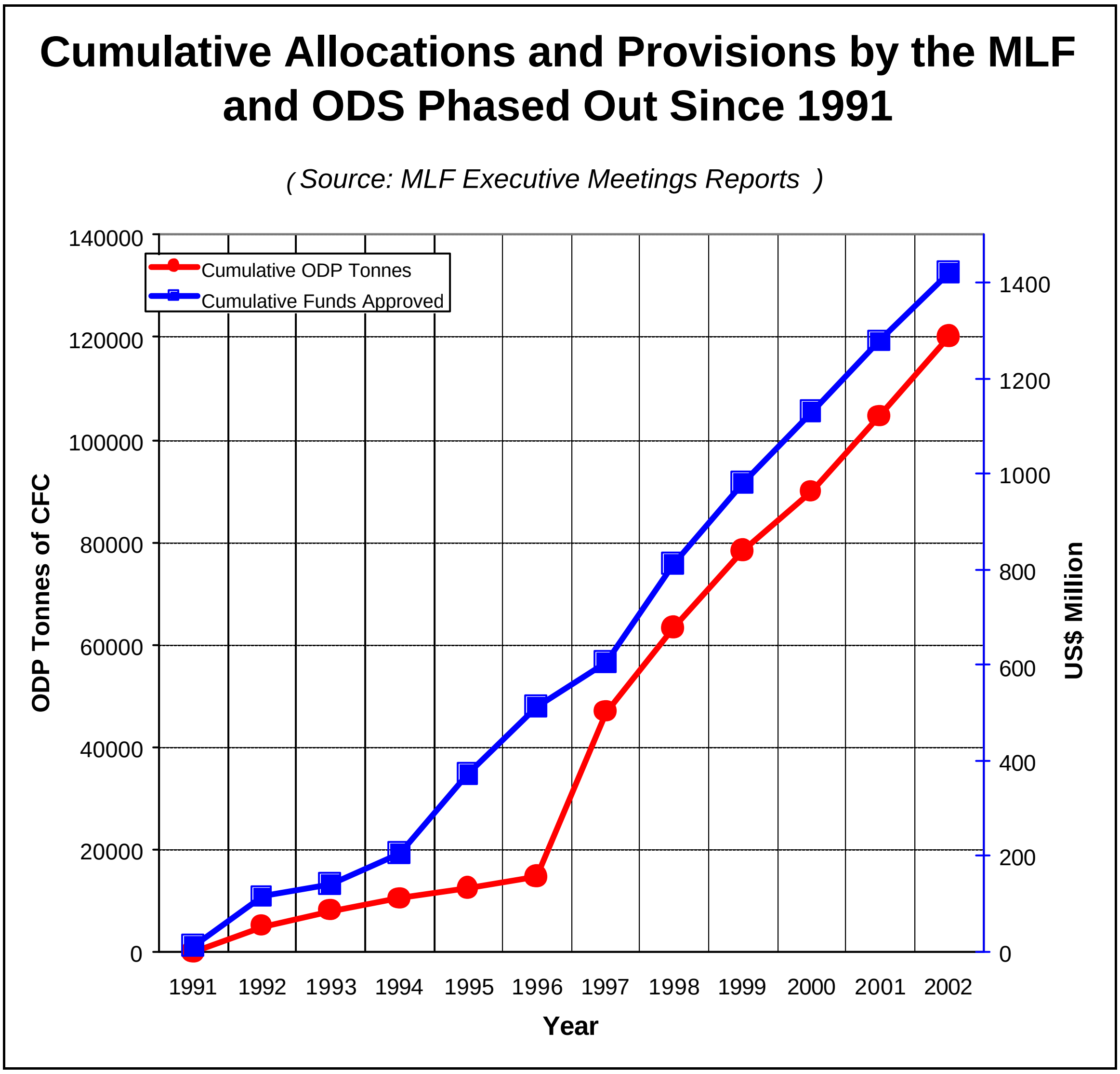

Figure 6 - Multilateral Ozone Fund: Cumulative Funds Approved and CFC Tonnes Phased Out.

The Global Environment Facility (GEF) was established by the world community to help developing countries deal with ozone depletion, climate change, biodiversity, and international waters. GEF supports projects and activities for phasing-out ozone-depleting substances in countries with economies in transition, as most of these Central and East European countries are not eligible for Multilateral Fund assistance. GEF approved over US$ 160 million to assist the following 17 countries in the phase-out of Annex A and B substances: Azerbaijan, Belarus, Bulgaria, Czech Republic, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Russian Federation, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. Additional funds of US$ 60 million have been ear-marked by GEF to assist CEIT countries with the phase-out of HCFCs and Methyl Bromide.

7. Implementing Agencies of the Multilateral Fund and GEF

The UN Environment Programme, the UN Development Programme and the World Bank implement the programmes of the Fund and the GEF in developing countries and in countries with economies in transition. In addition, the UN Industrial Development Organization was included later as an additional implementing agency of the Fund.

UNEP is responsible for information exchange, institutional strengthening, networking and preparation of country programmes. It has assisted over 100 developing countries as well as countries that were formerly part of the Soviet Union.

UNDP, UNIDO and the World Bank are responsible for technical assistance and investment projects for phasing out ozone-depleting substances in all countries receiving assistance.

8. The Remaining Challenges

The Protocol has been hailed as an extraordinary success so far, but there is no room for complacency because:

Ratification is incomplete.
Eleven countries have not yet ratified the ozone treaties, and many more have not yet ratified the London, Copenhagen, Montreal and Beijing Amendments.

Some countries with economies in transition are having difficulty complying with the Montreal Protocol.
This is due to the economic recession and political transition since 1989. The Russian Federation and a few other countries admitted in 1996 that they would be unable to follow the phase-out time-table for CFCs. Many have, however, managed to complete the phase-out by the year 2002. The Parties asked the GEF to provide this assistance, and it has thus far allocated over $160 million to these countries. In addition, the World Bank's Special Initiative raised $19 million from Austria, Denmark, Finland, Germany, Italy, Japan, Norway, Sweden, UK and US to close down the production of CFCs and Halons in the Russian Federation by the year 2000. The GEF has approved a further $60 million to assist these Parties with the phase-out of HCFCs and Methyl Bromide.

Illegal trade has increased.
Although all new CFCs are now banned in industrialized countries, millions of CFC-dependent refrigerators, automobile air conditioners, and other equipment are still in service. Alternatives are available to service this equipment, but they can be more expensive. Recycled CFCs may be used to maintain existing equipment, but it is difficult to distinguish between new and recycled CFCs. In addition, while most consumption is forbidden, industrialized countries still produce some CFCs in order to meet their own essential uses and to supply developing countries, as permitted by the Protocol. In the US, CFCs are heavily taxed and the market price is high. As a result, some traders illegally sell perhaps 20,000 tonnes of new CFCs in the industrialized countries every year in the guise of recycled substances or as exports to developing countries. Smugglers are subject to imprisonment and heavy fines, and national licensing systems are being established to better track imports and exports.

The potential for methyl bromide to be adopted in more applications and by more countries is worrying.
Some countries imposed controls on this chemical because of its toxicity even before the concern about its ozone depletion potential first arose. However, since many countries have not yet ratified the 1992 Copenhagen Amendment which introduced controls on methyl bromide, there is a risk that consumption could spread to more countries and to more uses.

Atmospheric concentrations of Halons continue to increase even though production ended in 1994.
This is because Halons in existing fire-fighting equipment get emitted whenever there is a fire. This is a concern because the bromine contained in Halons is 50 times more efficient than the chlorine in CFCs in depleting ozone. An expert panel is exploring the implications of de-commissioning existing Halons systems and destroying the Halons they contain.

Meeting the phase-out schedules by the developing countries!
With the arrival of the freeze on CFC production and consumption for the Article 5 Parties, the grace period granted to them by the Montreal Protocol has now ended. The Article 5 Parties have entered the "compliance" period in which they will have to achieve specific reductions in the national production and consumption of CFCs.

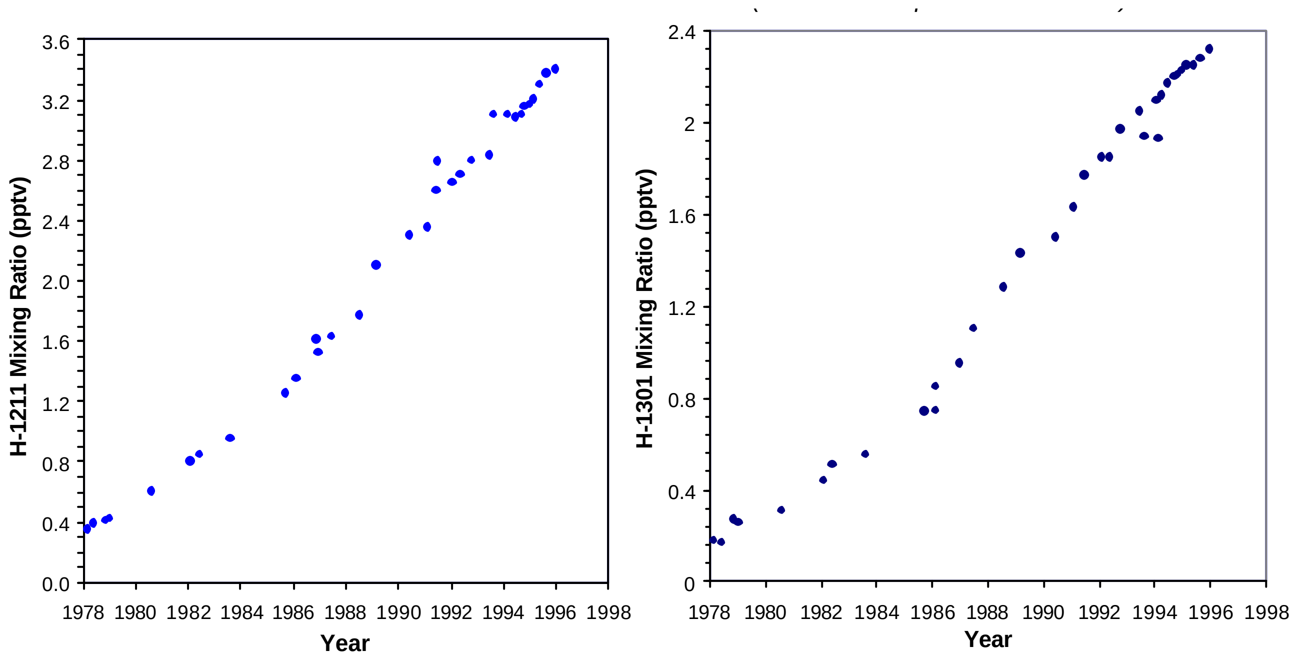

Figure 7 - Measured Atmospheric Concentration of Halons at Cape Grim, Tasmania.

Developing countries must implement their phase out of CFCs, Halons and carbon tetrachloride according to the schedule. Asian countries, in particular, have been increasing their consumption due to their high rates of economic growth and must now stabilize this consumption and begin reversing it. While consumption levels in the developed countries – which had been much higher on both a per-capita and a national basis – have been virtually phased out, the Montreal Protocol can only succeed if the developing countries – with 80% of world population – phase out these substances despite their growing economies. The Multilateral Fund will play an essential role in ensuring that this happens.

A large number of used CFC-based refrigerators are being exported to developing countries by countries that have phased out CFCs. These sales could make the future CFC phase out by developing countries more difficult by stimulating a large demand for CFCs to maintain this equipment.

CFCs are being replaced by HFCs, which have a large global warming potential. The Kyoto Protocol on climate change has included HFCs in the basket of six gases whose emissions are to be reduced by the industrialised countries. Are the two global protocols sending confusing signals? Does the Kyoto Protocol hinder the implementation of the Montreal Protocol? The Parties to the Montreal Protocol as well as the Parties to the Climate Change Convention now have the reports of their scientific and technical panels on how to minimise the emissions of HFCs. Implementation of the panels' recommendations by governments is important.

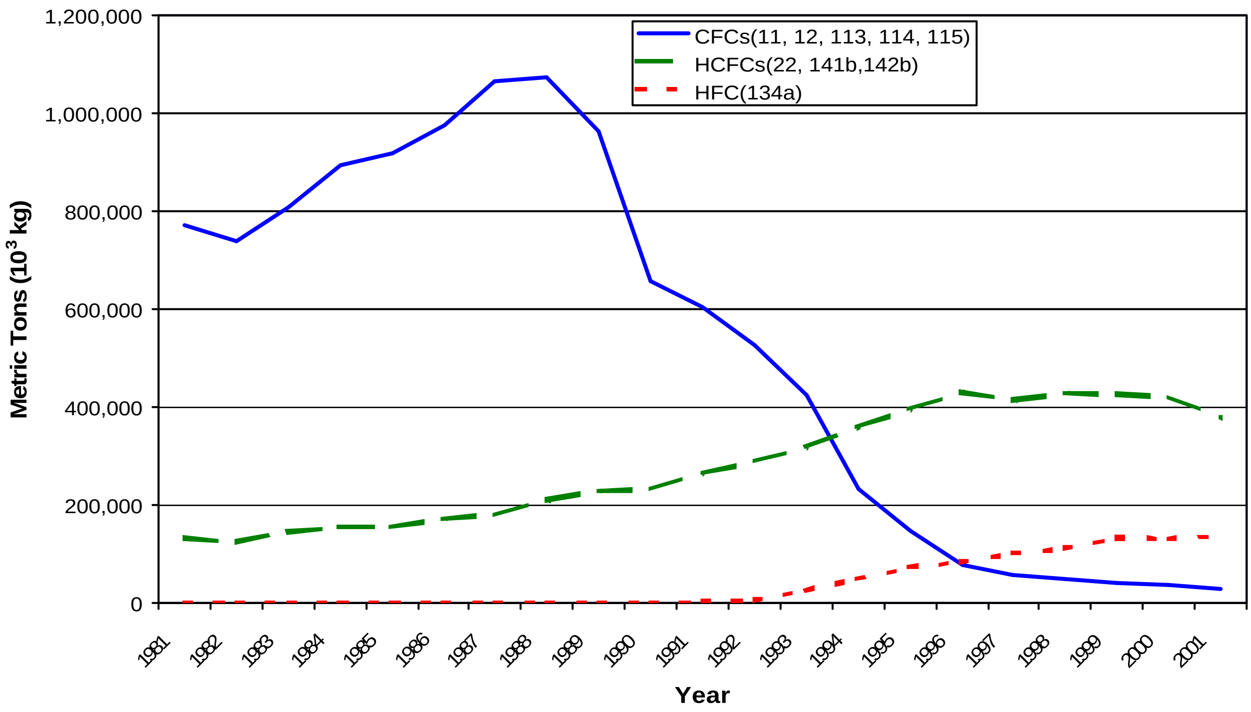

Figure 8 - Worldwide Production of CFCs, HCFCs and HFCs

9. Lessons of the Montreal Protocol

The Montreal Protocol offers many lessons that could be applied to solving other global environmental issues:

- Adhere to the "precautionary principle" because waiting for complete scientific proof can delay action to the point where the damage will become irreversible.
- Send consistent and credible signals to industry (e.g. by adopting legally binding phase-out schedules) so that they have an incentive to develop new and cost-effective alternative technologies.
- Ensure that improved scientific understanding can be incorporated quickly into decisions about the provisions of a treaty.
- Promote universal participation by recognizing the "common but differentiated responsibility" of developing and developed countries and ensuring the necessary financial and technological support to developing countries.
- Control measures should be based on an integrated assessment of science, economics, and technology.

10. Note to Journalists

This backgrounder was updated on 2 July, 2003. Official documents and other information is available via the Internet at **http://www.unep.org/ozone** or at **http://www.unep.ch/ozone**. The Ozone Secretariat is based in Nairobi. For interviews or additional information, contact:

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