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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. This ozone, which forms what is known as the ozone layer, protects the earth's inhabitants from harmful UV radiation, and is essential for life on earth. In contrast, ozone that is found at ground-level, at the bottom of the troposphere, is a harmful pollutant resulting from automobile exhausts and other sources.

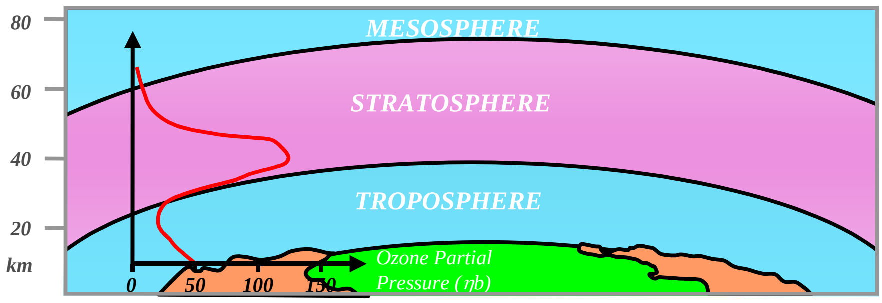

Figure 1 - Ozone Distribution in the Atmosphere

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. When the ozone layer is depleted, more UV-B is allowed to reach the earth. This increased UV-B can lead to 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 about depletion of the ozone layer started in 1970 when Prof. Paul Crutzen pointed out the possibility that nitrogen oxides from fertilizers and supersonic aircraft might deplete the ozone layer. Then, in 1974, Professors F. Sherwood Rowland and Mario J. Molina theorized that when CFCs finally break apart in the atmosphere and release chlorine atoms, those atoms interact with stratospheric ozone to cause ozone depletion. Bromine atoms released by halons and methyl bromide 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 thinned since measurements started in the early 1980s, causing the phenomenon now noted as the ozone hole. The problem is worst over this part of the globe due to the extremely cold atmosphere and the presence of polar stratospheric clouds, which serve as a surface to stimulate destruction of ozone molecules. The polar 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. On 12 September 2000, the area of the ozone hole reached a record 29 million sq. kilometers; it extended to 27 million sq. km. in September 2003 and 24 million sq. km in 2004. 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% in springtime.

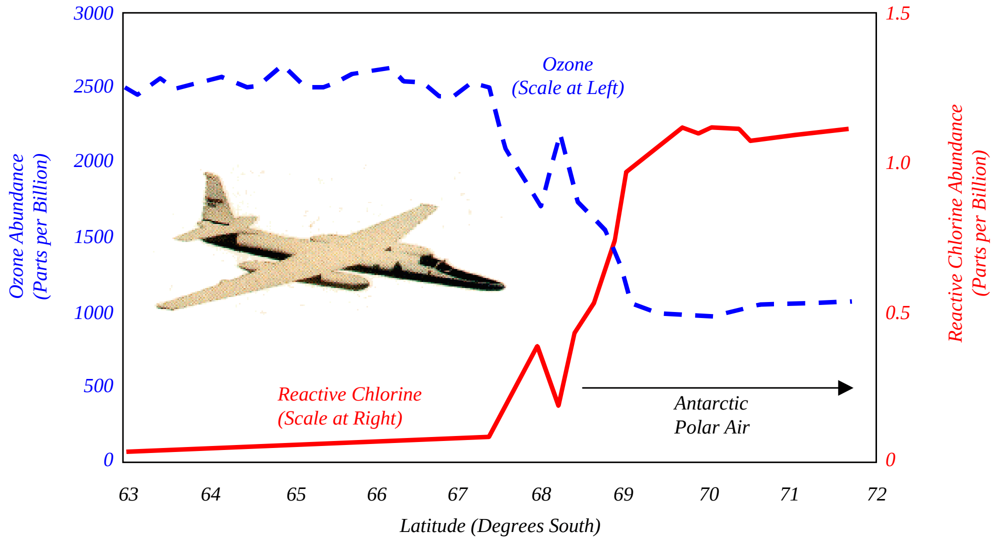

Figure 2 - Measurements of Ozone and Reactive Chlorine from a Flight Into the Antarctic Ozone Hole, 1987

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. Initial inter-governmental negotiations for an international agreement to phase out ozone-depleting substances started in 1981 and led to 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. Immediately following agreement on the Convention, work began on negotiating a Protocol to control the production and use of ozone depleting substances.

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 firm 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 1990 (London), 1992 (Copenhagen), 1995 (Vienna), 1997 (Montreal), 1999 (Beijing) and again in 2007 in Montreal. It has also been amended to introduce other kinds of control measures and to add new controlled substances to the treaty; the 1990 London Amendment added control of additional CFCs (CFC-13, -111, -112, -211, -212, -213, -214, -215, -216, -217) and two chlorine containing solvents (carbon tetrachloride and methyl chloroform), while the 1992 Copenhagen Amendment added the control of 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 to meet related treaty requirements until they ratify the Protocol and related Amendments. While the Protocol has an outstanding record for ratification, unfortunately, ratification of the more recent amendments and their stronger control measures lag behind. As of 25 June 2008, the Ozone Agreements had been ratified by countries as depicted in the chart in Figure 3.

Ozone Protocol and Amendments Ratification Status

(Information sent to the Ozone Secretariat by the Depositary, UN Office of Legal Affairs, 25 June 2008)

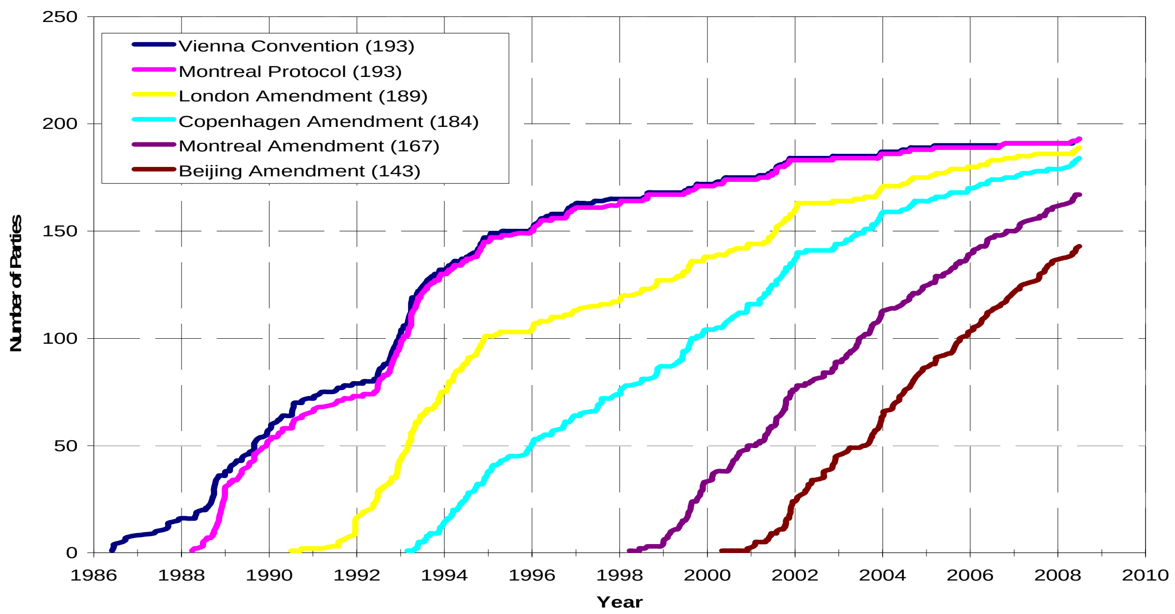

Figure 3 - Ratification Status of the Montreal Protocol and its Amendments.

3. The Chemicals and Their Phase-Out Schedules

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

- ***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 has a lifetime in the atmosphere of 50 years, CFC-12 of 102 years, and CFC-115 of 1,700 years. Halons, which have high ozone destroying properties, are used primarily in fire extinguishers.
- ***Carbon tetrachloride*** is used as a solvent and the lifetime is about 42 years in the atmosphere.
- ***Methyl chloroform*** (1,1,1-trichloroethane) is also used as a solvent, with an atmospheric lifetime of about 5.4 years.
- ***Hydrobromofluorocarbons (HBFCs)*** are not widely used, but they have been included in the Montreal Protocol to prevent any new uses.
- ***Hydrochlorofluorocarbons (HCFCs)*** were originally developed in the 1950s as refrigerants for air conditioning and a number of them became the first major replacements for CFCs in several application areas in the 1990s. 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 for controlled

uses (not including uses for quarantine and pre-shipment) was about 10,000 tonnes in 2006. The lifetime is about 0.7 years.

- ***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 as contained in the Protocol 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;
- Reduce HCFCs by 35% by 2004, 75% by 2010, 90% by 2015, and phase out by 2020, allowing 0.5% for servicing purposes during the period 2020-2030;
- Phase out HBFCs by 1996 and phase out BCM by 2002.

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 currently in the Protocol are as follows:

- Phase out HBFCs by 1996 and phase out BCM by 2002;
- 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 and 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 2013 at the average 2009 and 2010 levels; Reduce HCFCs by 10% by 2015, 35% by 2020, 67.5% by 2025 and phase out by 2030, allowing for an annual average of 2.5% for servicing purposes during the period 2030-2040.

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 use material that had been stockpiled, or produced and/or used as a feedstock in the production of other chemicals. They are also allowed to produce and import limited quantities in order to meet those uses agreed by the Parties to be essential uses for which no technically and economically feasible alternatives have been identified. Historically, this has included the use of CFCs in metered dose inhalers for asthma. Under the Protocol, production is defined as the total amount produced in a country, minus amounts destroyed or used as chemical feedstock. Consumption is defined as the total amount produced in a country, plus the total amount imported, minus the total amount exported. 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 The Results Been So Far?

It is estimated that 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 the UV-B radiation reaching the earth in the highly populated northern mid latitudes and a quadrupling in the southern latitudes. The amount of ozone-depleting chemicals in the atmosphere would have been five times greater. The implications of this would have been horrendous, and have been estimated to include: 19 million more cases of non-melanoma cancer, 1.5 million more cases of melanoma cancer, and 130 million more cases of eye cataracts than with the current version of the Montreal Protocol. These facts are depicted in Figures 4.1-2.

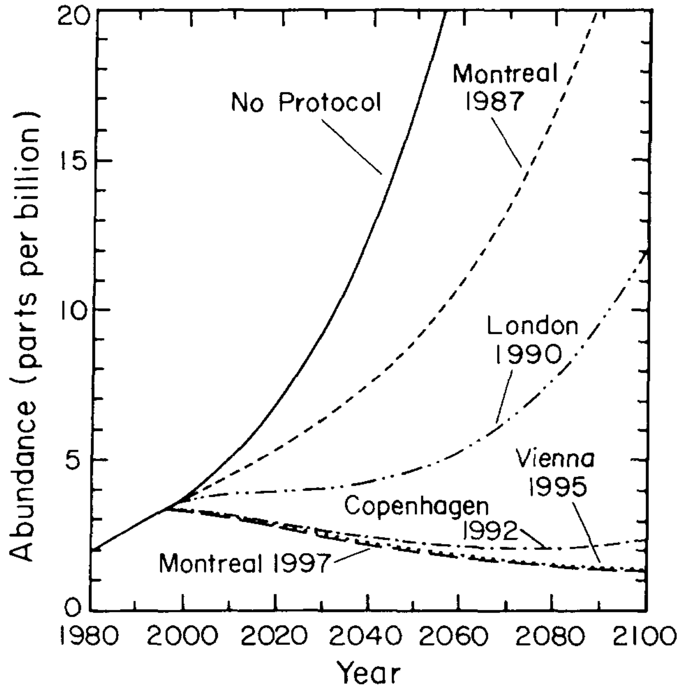

Figure 4.1 - Abundance of ozone depleting substances in the stratosphere over time – The effect of the Montreal Protocol and its Amendments on the stratospheric ozone losses.

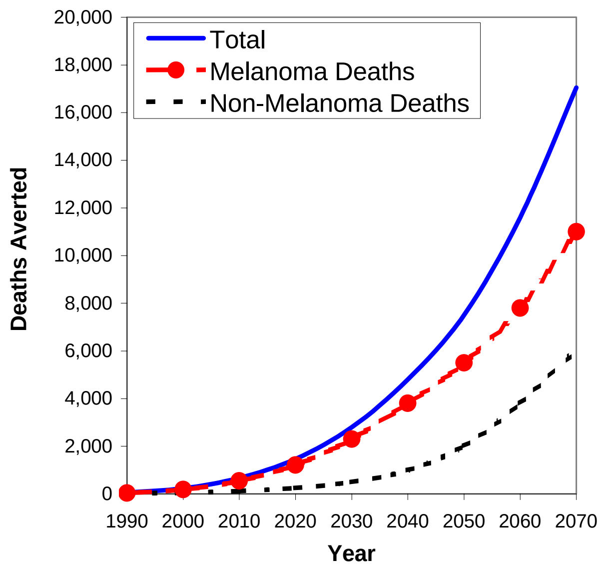

Figure 4.2 - Projections: Annual Deaths from Melanoma and Non-Melanoma Skin Cancer Averted due to the Montreal Protocol

Success to date has been outstanding: In 1986 the total consumption of CFCs world-wide was about 1.1 million ODP tonnes; by 2006 this had come down to about 35,000 tonnes. The bulk of the 1986 total, or about 0.9 million tones weighted in terms of ozone depletion potential, was consumed in developed countries, but this figure declined to about 1,000 tonnes in 2006, including consumption for exemptions approved by the Parties. Globally, the Montreal Protocol has by 2006 resulted in the phasing out of over 96 per cent of all ozone-depleting substances. As most of these substances are also potent greenhouse gases, the Protocol has also delivered substantial climate benefits. It is estimated that the reduction in ozone depleting substances between the peak levels in the 1990s and the year 2000 has yielded a net integrated reduction of approximately 25 billion tones of CO2 weighted global greenhouse gases.

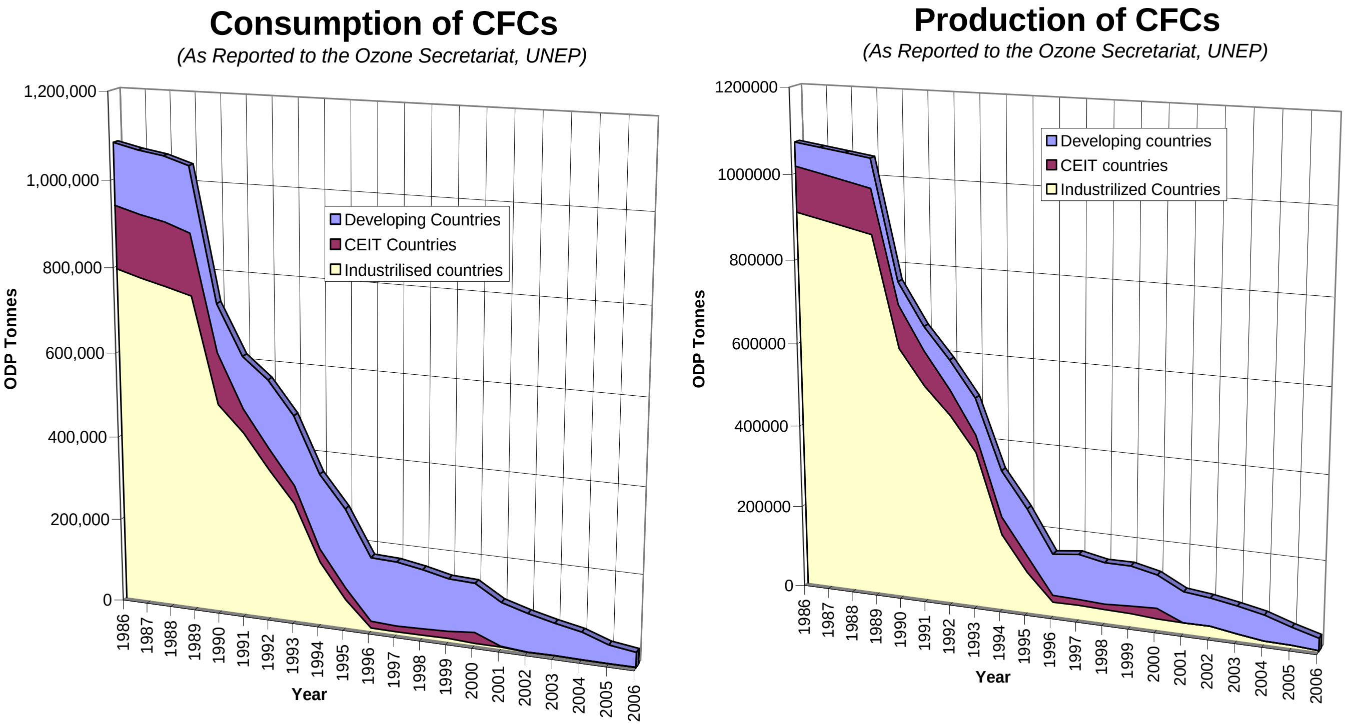

Figure 5 - Worldwide Production and Consumption of CFCs

Scientists can now show that the total combined abundance of ODSs is presently declining not only in the lower atmosphere (troposphere), but also in the stratosphere, and that ODS levels reached their stratospheric peak in the late 1990s. Assuming continuing compliance with the Protocol, it is estimated that the global ozone levels (60°S-60°N) will recover to the pre-1980 values around 2050. However, the future state of the ozone layer will be affected by multiple factors, including the abundance of ozone-depleting substances and climate change.

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 initially used HCFCs as alternatives, but new equipment is increasingly using replacements with zero ozone-depleting potential, including hydrofluorocarbons (HFCs), hydrocarbons and ammonia.

Consumers are recycling existing ozone depleting substances. Recycling and banking of halons is extensive, and essential 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 and thereby obviating the need for replacement of such equipment prior to the end of its useful life.

HCFCs, with lower ozone depleting potential than CFCs, were initially used as replacements to CFCs and were therefore critical for meeting the early CFC phase-out goals. CFCs and HCFCs are now being replaced by HFCs, which have a large global warming potential (Figure 6). Countries are currently trying to minimize their emissions of HFCs.

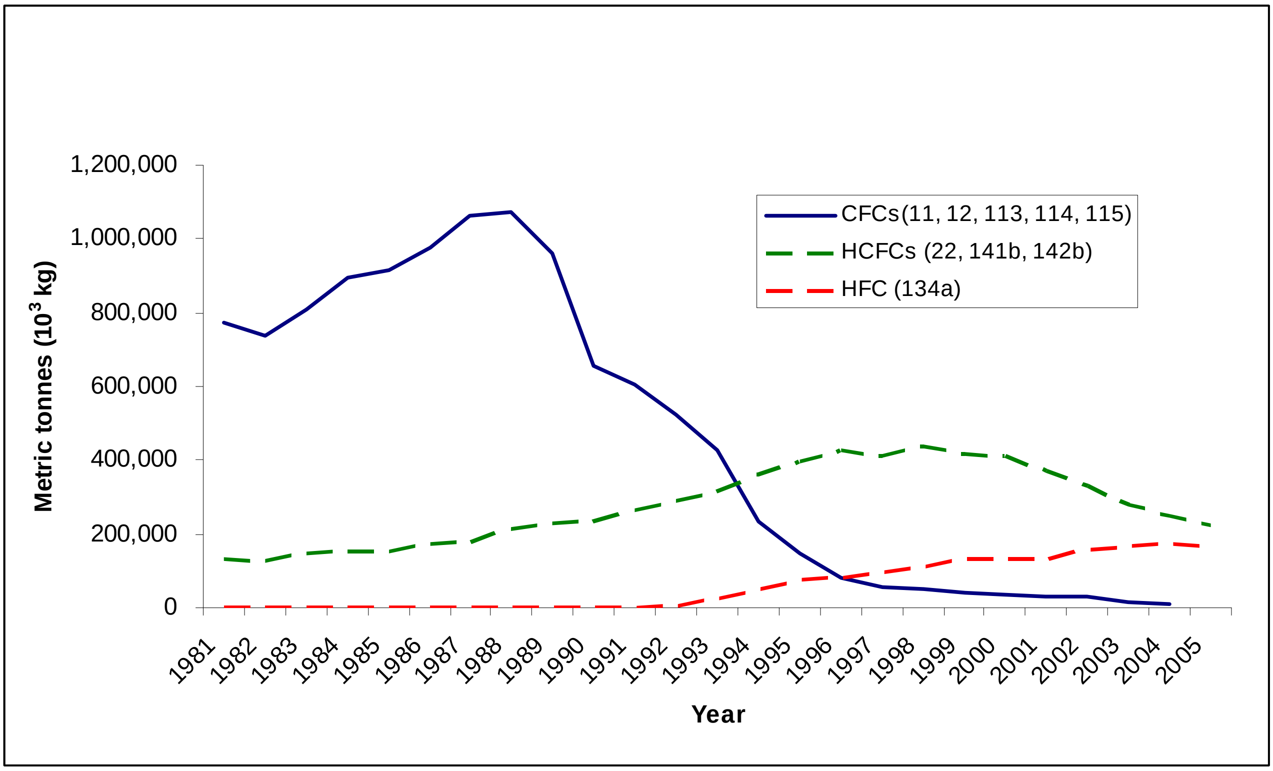

Figure 6 - Worldwide Production of CFCs, HCFCs and HFCs

5. A summary of the 2006 findings of the Assessment Panels

The latest assessment reports, prepared by the Montreal Protocol Assessment Panels in pursuance of Article 6 of the Protocol, comprise the 2006 assessment. The next major assessment is currently being prepared for the Parties' consideration in 2010.

Key Findings on Science:

- The Montreal Protocol is working. There is now stronger evidence since the 2002 Assessment that global ODS concentrations are decreasing and that the global stratosphere (60°S-60°N) has likely already experienced its highest levels of ozone depletion from man-made halocarbons.

- Outside polar regions the ozone layer has shown some initial signs of recovery and the decline of stratospheric ozone seen in the 1990s has not continued. Assuming continued compliance with the Protocol, global ozone levels (60°S-60°N) are estimated to recover to the pre-1980 values around 2050.

- Polar ozone loss will remain large and highly variable in the coming decades. Assuming continued compliance with the Protocol, Arctic ozone levels are expected, on average, to return to pre-1980 levels before 2050, while Antarctic ozone is expected to do so in 2060-2075.

- Failure to continue to comply with the Montreal Protocol could delay or even prevent the recovery of the ozone layer.

- The decrease in ODS emissions already achieved by the Montreal Protocol remains the dominant factor in the return of ozone levels to pre-1980 (pre-ozone-hole) values. However, the temporal and regional patterns of ozone layer recovery in the atmosphere will depend on various factors, such as changes in climate, future levels of the well-mixed greenhouse gases and stratospheric water vapour, as well as uncertainties in transport, banks, and future emissions. HCFCs and the release of "banked" CFCs will continue to contribute to ozone depletion until roughly the middle of the 21st century.

- Reduction in the abundance of methyl chloroform and methyl bromide contributed the most to the present decline in effective equivalent tropospheric chlorine levels. Methyl chloroform will soon be insignificant in the stratosphere.

- HCFCs continue to increase in the atmosphere. In 2004 they accounted for 6% of total tropospheric chlorine. HCFC-22, the most abundant of the HCFCs, is currently (2000-2004) increasing at a rate of 3.2%/year. HCFC-141b and HCFC-142b levels increased by respectively 7.6% and 4.5%/year over the same period.

- Total tropospheric bromine from halons and methyl bromide peaked around 1998 and has since declined by 3-5%. This observed decrease was solely due to decreased industrial production of methyl bromide.

- The effectiveness of bromine compared with chlorine for global ozone depletion (on a per-atom basis), has been re-evaluated upward from 45 to a value of 60. The Ozone Depletion Potentials (ODPs) of brominated compounds have, therefore, increased proportionately.

- The role of very short-lived halogenated substances is now believed to be more important than previously thought, and ozone depletion could be enhanced by significant anthropogenic production of these substances.

Key Findings on Environmental Effects:

- UV-B radiation influences living organisms, ecosystems, and materials.

- In human populations UV-B radiation can cause severe damage to the eyes, skin cancers, and suppressions of the immune system. The incidence of squamous cell carcinoma (SCC), basal cell carcinoma (BCC), and melanoma continue to rise, a fact partly attributed to increases in UV-B radiation. In children, the incidence of melanoma is still rising and has been positively correlated with environmental UV radiation exposure. UV-B suppresses some functions of the human immune system. This is a crucial factor in increasing the incidence of skin cancer and may also contribute to viral reactivation and a reduction in vaccine effectiveness.

- Effects of UV-B radiation on plants encompass changes in plant growth and form, which may lead to changes in competitive balance and consequent changes in species composition. Large decreases in root mass and other below-ground changes also occur as a result of UV-B radiation above ground. Climate change factors, such as CO_2 and water availability, interact with UV-B radiation eliciting complex plant responses. In terrestrial ecosystems, UV-B radiation can alter carbon and nutrient cycling, and in aquatic ecosystems, the biological availability and toxicity of metals are changed, leading to bio-accumulation in food webs. In aquatic ecosystems, the changes in community structure are more important than effects on overall biomass.

- Climate change will influence the exposure of all living organisms to UV-B radiation via changes in cloudiness, precipitation, and ice cover. Other factors associated with climate change, such as human and animal behaviour, will also determine the amount of UV-B exposure. In addition, there are indications that several reactions to UV-B radiation work more effectively at higher environmental temperatures. For instance, enhanced UV-B radiation together with high temperatures leads to faster degradation of wood and plastics, which has implications for the materials industry. The temperature effect also applies to the induction of nuclear cataract of the eye and non-melanoma skin cancer.

Key findings on Technology and Economics:

The developments that occurred in all Parties between 2002 and 2006 increase the technical and economic feasibility of:

1. the acceleration of the phase-out of consumption of most ODS;
2. the reduction of the emissions in many applications; and
3. the collection and destruction of ODS contained in foam products, refrigeration, air conditioning and other equipment.

Some of the key findings are summarized as follows:

Chemicals

- Some carbon tetrachloride (CTC) and CFC feedstock and process agent uses exempted by the Protocol could be replaced by HCFCs or by not-in-kind manufacturing processes using non-ozone depleting substances (non-ODSs).

Foams

- Hydrocarbons (HCs) are now the largest single class of blowing agents in use globally (36% of the total). HCFCs also continue to have a significant part of the market (22% of the total) - despite phase-out in many developed countries- primarily because of rapid growth in the use of insulating foams in some developing countries to improve the energy performance of new buildings. Hydrofluorocarbons (HFCs) have been introduced into some foam sectors, but price and the application of responsible use criteria have limited their uptake to less than 60,000 tonnes globally (16% of the total).

Halons

- The civil aviation sector continues to be dependent on halons and has not demonstrated further progress through the adoption of alternative technologies in new airframe designs. The sector lacks an agreed technical design strategy to implement alternative methods of fire suppression.
- Adequate supplies of halons 1211, 1301, and 2402 are expected to be available on a global basis; however, they are projected to be unevenly distributed amongst the major regions of the world, an issue raising concerns.

Medical applications

- Global phase-out of CFCs in Metered-Dose Inhalers (MDIs) is achievable by 2010. However, considerable challenges remain in achieving transition to alternatives, particularly in developing countries.
- A relatively large number of companies manufacturing CFC MDIs in developing countries do not yet have the skills or knowledge needed to phase out CFC MDIs. It is critical that technical expertise and funds for technology transfer and equipment are available to ensure that patients in these countries receive essential inhaled treatment.
- Pharmaceutical-grade CFC production for MDIs may be economically impractical after 2009. If global transition in CFC MDI manufacture is not achieved by 2010, Parties may need to consider the necessity for a final campaign production of pharmaceutical-grade CFCs and the acquisition of remaining stockpile from developed countries.

Methyl bromide

- Technical alternatives exist for almost all controlled uses of methyl bromide.
- Phase-out for the remaining methyl bromide uses will be greatly influenced by the registration and the regulatory controls on several key chemical alternatives (including 1,3-dichloropropene, chloropicrin, methyl iodide and sulfuryl fluoride) and by the incentives for non-chemical alternatives and Integrated Pest Management (IPM).
- Full implementation of barrier films in soil fumigation could significantly reduce methyl bromide dosage rates and emissions.
- Increased use of methyl bromide for Quarantine and Pre-shipment (QPS) may be offsetting some of the gains made by reductions in controlled uses for soils and other non QPS uses. QPS methyl bromide use is particularly increasing in response to the International Standard for Phytosanitary Measures (ISPM

15) encouraging methyl bromide use on wooden packaging material despite the availability of an authorized alternative to methyl bromide for this use.

- Parties contemplating controls on exempted methyl bromide use may wish to consider economic incentives that encourage minimal use, containment, recovery, and recycling; as well as not-in-kind alternatives and substitutes for the products that are traded.

Refrigeration

- In contrast to developed countries, CFCs and HCFCs will continue to be the primary service refrigerants in most developing countries because of long equipment life and the costs of field conversion to alternative refrigerants. Containment and conservation are therefore likely to need increasingly more attention with time.
- Several low Global Warming Potential (GWP) refrigerant candidates (one with an ozone depleting ingredient -- CF_3I) are claimed to provide comparable energy efficiency to HFC-134a in vehicle air conditioning. Development of these low-GWP refrigerants may also have major future consequences for (new) refrigerant choices in other sectors and applications.

Cross-Sectoral Findings

- Technically and economically feasible substitutes are available for almost all applications of HCFCs, although transitional costs remain a barrier for smaller enterprises, particularly in developing countries.
- A considerable portion of the 3.5 million ODP-tonnes of ODS contained in banks is available for collection and destruction at costs that can be justified by benefits in reducing ODS and greenhouse gas emissions.
- Parties contemplating ODS collection and destruction may wish to consider incentives for collection that avoid prolonged use of inefficient equipment, intentional venting or product dumping. In this context, the classification of ODS recovery and destruction activities as carbon offset projects could warrant further investigation.

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

The Multilateral Fund for the Implementation of the Montreal Protocol is the primary component of the financial mechanism established under the London Amendment to 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, which has undergone replenishment every three years, had an initial allocation of US$240 million for 1991-1993, US$455 million for 1994-1996, US$465 million for 1996-1999, US$440 million for 2000-2002, US$474 million for 2003-2005, and US$470 million for 2006-2008. The Multilateral Fund has thus far approved the disbursement of some 2.19 billion dollars for capacity building and projects to phase out CFCs.

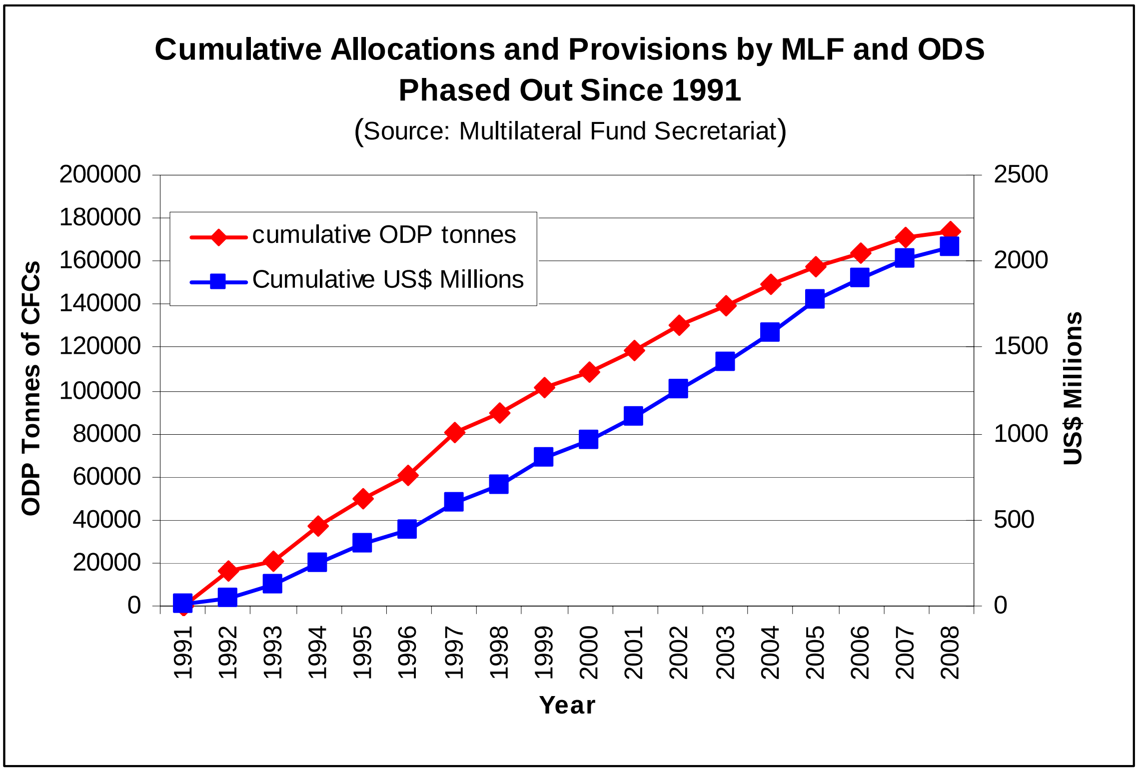

Figure 7 - Multilateral Ozone Fund: Cumulative Funds Approved and CFC Tonnes Phased Out.

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 were not historically eligible for Multilateral Fund assistance. GEF approved to date over US$180 million to assist the following 18 countries in the phase-out of the most commonly used ozone depleting substances: Armenia, Azerbaijan, Belarus, Bulgaria, Czech Republic, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Russian Federation, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. Over time, many of these countries have become members of the European Union or were classified as developing countries under the Montreal Protocol, and they are therefore no longer eligible for GEF support.

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.

Furthermore, several donor Parties pay part of their contributions to the MLF through submitting projects and phase-out activities as bilateral co-operation.

8. The Remaining Challenges

While the Montreal Protocol has made great strides in the global effort to protect the ozone layer, the task is far from complete. The following are among the continuing challenges that the Protocol Parties still need to address before they can rest assured that the ozone layer will continue to be safe for this and future generations:

Sustaining the momentum for the total global phase-out needed to ensure protection of the ozone layer: All scientific analysis predicting the healing of the ozone layer is premised on the expectation of full compliance with the phase-outs required by the Protocol. By 2010, the Parties must therefore facilitate the elimination of the final 20-30% of the most commonly used ozone depleting substances in developing countries in a manner that minimizes economic disruption. While support for related activities is being provided, the final phase-out of these remaining uses, which include the use of CFCs in large amounts commercial and industrial refrigerators, chillers and automobile air conditioners, will not be easy. The Parties must also address the continuing use of methyl bromide, and deal effectively with the new HCFC phase-out schedules in both developed and developing countries.

Phase-out of HCFCs in a climate friendly manner: At the 20th anniversary meeting of the Parties to the Montreal Protocol, a decision was taken to accelerate the controls on HCFCs. This decision recognized both the ozone depletion potential and the global warming impact of this class of chemicals. It was also recognized that the global warming benefits which might accrue from the decision will depend greatly on the alternatives selected to implement the new phase-out schedule. All Parties will face a real challenge in implementing this new phase-out schedule in the most energy-efficient, climate friendly manner possible.

Funding: Many Parties have found that as the phase-out has progressed significantly, it is becoming increasingly difficult to get the attention of or funding from policy makers to deal with the remaining phase-out challenges. To date, most eligible developing countries have relied heavily upon funding from the Protocol's Multilateral Fund to support their phase-out efforts, and continued assistance from the Fund in the years up to and after 2010 will be important to ensuring that a high level of compliance in these countries is maintained. The essential completion of the phase-out in both developed and developing countries will require a commitment to both a continued high level of attention to the issue and continued funding.

Dealing with illegal trade and ensuring that continued use of ozone depleting substances are not diverted to illegal uses: As the continuing phase-out of ozone depleting substances further constrains their supply, the temptation to make money through illegal trade in such substances often increases; the Parties need to redouble their efforts to address this issue.

Addressing banks of ozone depleting substances: Thousands of tonnes of ozone depleting substances contained in existing equipment and products, the so-called 'banks', need to be managed appropriately in order to avoid their emissions to the environment. Such emissions could reverse much of the good work accomplished so far under the Montreal Protocol. Parties are therefore challenged to deal with this problem in an environment-friendly manner, taking into consideration related inter-linkages with relevant actions under other multilateral environmental agreements.

Ensuring control of new chemicals found to pose an undue threat to the ozone layer: The same creative entrepreneurial spirit that inspired the development of alternatives to ozone depleting substances may spark the invention of new substances with ozone depleting properties. The Parties must be vigilant in the testing of new chemicals, lest new ozone depletors gain a foothold in the marketplace.

Finding alternatives for remaining halon uses: While halons have been virtually phased out, some key uses (such as airplanes and certain military applications) continue to rely on stockpiles of halons to meet continuing needs. Efforts to find alternatives for these uses must continue.

Monitoring the ozone layer to ensure that expected healing is taking place: New knowledge has recently led scientists to push back the date that they believe the ozone layer will be healed. The world community needs to continue to monitor the state of the ozone layer so that it can be confident that related risks are being addressed.

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 approach" 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 by 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 16 September 2008. Official documents and other information are available online at **http://ozone.unep.org/**. The Ozone Secretariat is based in Nairobi. For interviews or additional information, contact:

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