

Ozone Treaty's Role in Combating Climate Change

Crossing the last hurdle of HCFCs

Highlights

Since 1990, actions under the Montreal Protocol in phasing out ozone depleting substances will have had the additional benefit, by 2010, of reducing greenhouse gas (GHG) emissions by about 11 billion tonnes CO₂-equivalent per year (GtCO₂-eq/yr) - which is 5-6 times the reduction target of the Kyoto Protocol between 2008 and 2012.

Presently most hydrochlorofluorocarbon (HCFC) production is in developing countries and rising at the rate of 15% per annum.

The recently agreed HCFC phase-out schedule presents countries with an historic opportunity to not only reduce the levels of ozone depleting substances in the atmosphere, but also to have a further significant impact on the climate, as many HCFCs are powerful greenhouse gases.

However these emission reductions would only be achieved if zero or low global warming potential (GWP) substitute technologies are adopted by countries to replace HCFC usage. There is also an opportunity to gain significant additional climate benefits from improved energy efficiency and other improvements of the replacement technologies.

The UNEP DTIE OzonAction Programme is assisting developing countries to make informed decisions about technologies and policies to replace HCFCs, with a particular emphasis on the climate benefits that can be achieved.

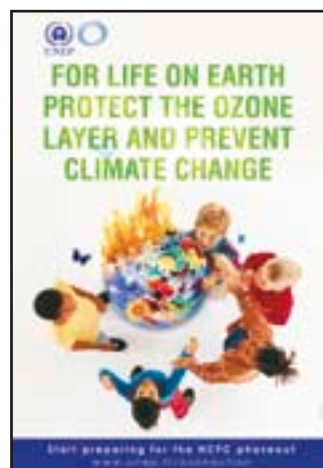
While the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol represent the principal agreements addressing climate change, the Montreal Protocol has emerged as a significant mechanism for getting a dual benefit, i.e. protecting the ozone layer and mitigating climate change as well. Certain ozone depleting chemicals are also potent greenhouse gases. Many ozone depleting substances (ODS) and the fluorocarbon gases used to replace them (such as hydrofluorocarbons - HFCs) have significant global warming potentials (GWPs), ranging from 4,000 - 11,000 for CFCs, to 700 - 2,300 for hydrochlorofluorocarbons (HCFCs). For comparison, the GWP of HFCs controlled under the Kyoto Protocol range from 90 - 12,200. By design, ODS are not controlled under the UNFCCC or the Kyoto Protocol because the phase out of their production and consumption is being addressed by the Montreal Protocol.⁽¹⁾

It has been estimated that the annual contribution of ODS to greenhouse gas emissions peaked in 1988 at a value slightly less than half that of global CO₂ emissions. Moreover, it has been estimated that in the absence of the Montreal Protocol, ODS emissions would have reached 14-18 GtCO₂-eq/yr in 2010. Some experts have argued that, since its inception in 1987, the Montreal Protocol has achieved significantly greater climate protection (i.e. 5-6 times) than that contemplated by the first commitment period under the Kyoto Protocol.

The HCFC phase-out as a climate opportunity

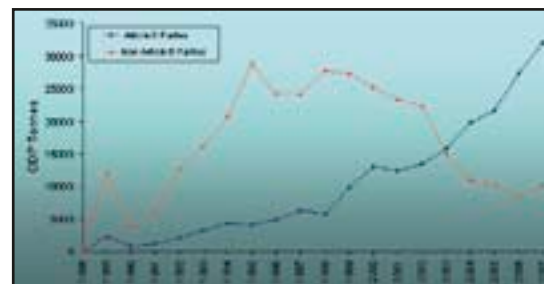
The Montreal Protocol recently had another breakthrough that will further contribute to reducing GHG emissions. In 2007, the Parties decided to accelerate

the phase-out of HCFCs, gases with low ozone depletion potential which were promoted as transitional replacements for CFCs to enable the latter gases to be quickly phased out. Developing countries must now freeze HCFC production and consumption to



their 2009-2010 level by 2013, and phase-out 10 percent of production and consumption by 2015, 35 percent by 2020, 67.5 percent by 2025, and 100 percent by 2030, with 2.5 percent allowed, if necessary, for servicing existing equipment until 2040. Developed countries also accelerated their phase-out schedule by 10 years to completely eliminate HCFC production and consumption by 2020, with 0.5 percent allowed, if necessary, for servicing existing equipment until 2030.

This accelerated phase-out of HCFC presents developing countries with an unprecedented opportunity to adopt ozone and climate-friendly technologies and policies. This transition to ozone- and climate-friendly options is being financially and technically supported by the Montreal Protocol's Multilateral Fund, through the preparation and implementation of national HCFC Phase-out Management Plans (HPMPs) for developing countries. The Parties to the Montreal Protocol directed the Multilateral Fund, when providing this assistance, to focus on, *inter alia*, substitutes and alternatives that minimize other impacts on the environment, including on the climate, taking into account global warming potential, energy use and other relevant factors.⁽²⁾



■ HCFC consumption from 1986 to 2007 in developing (Article 5) countries + industrialized (non Article 5) countries.

According to various estimates, phasing out HCFCs and their by-products could result in significant climate benefits by 2050. The IPCC and the Montreal Protocol's Technology and Economic Assessment Panel (TEAP) estimated in a joint study that the climate benefits of phasing-out HCFCs to be about 18 GtCO₂-eq over the 2015-2050 period.⁽³⁾

If we consider further possible benefit due to improved energy efficiency of equipment using HCFC alternatives and recovery and destruction of old equipment, the emission reductions could go up to 38 GtCO₂-eq over the same period.⁽⁴⁾

However, achieving these potential climate benefits depends on the replacement technologies adopted and can only be attained if low - or zero - GWP alternatives are adopted as replacements to HCFCs.

■ Non-HCFC technology: choosing the road less travelled

*Two roads diverged in a wood, and I--
I took the one less travelled by,
And that has made all the difference.*

Robert Frost

The dual gains for the ozone layer and climate system will be realised only if countries choose the right path, which may not be the "business as usual" technology option and which may require additional consideration by those making the decision. The technology choices to be made revolve around:

- Replacement of HCFCs with non - or low - GWP alternatives.
- Improved energy efficiency of equipment.
- Improved engineering/equipment design to minimise leakage.
- Improved servicing techniques that minimize emissions.
- Recovery and destruction of old equipment and insulating foam.
- Integrated strategies and management plans.

■ OzonAction: helping countries choose the right road

UNEP, through its OzonAction Programme, is helping National Ozone Units (NOUs) and other key stakeholders in developing countries make informed decisions about technologies and policies to replace HCFCs, with a particular emphasis on the climate benefits that could be achieved. These services include:

HPMP preparation

OzonAction is assisting more than 80 countries to prepare HCFC Phase-out Management Plans (HPMPs), with a focus on establishing accurate and comprehensive baseline data, and creating awareness

■ Training workshop on refrigeration in Cambodia



about technology options and co-benefits with climate.

Information sharing

OzonAction promotes information sharing about non-HCFC technologies and policies through its Regional Networks of Ozone Officers, which currently serve 145 developing countries. The Programme also organises special thematic meetings on HCFC and HPMP-related topics outside of the main Network meetings.

Raising awareness

OzonAction's Information Clearinghouse is producing a suite of technical and policy information materials to help NOUs control consumption through awareness activities. The goal is to create high-level awareness that results into very desirable reductions in the growth of HCFCs, thereby reducing future costs to the Multilateral Fund and the environment.

Bilateral projects

UNEP is also implementing some complementary projects, in addition to those funded by the Montreal Protocol's Multilateral Fund, to offer additional assistance to countries in providing policy and technology advice and information to expedite their compliance with the HCFC phase-out obligations and at the same time to adopt environmentally friendly alternatives. Two such projects are funded by the European Commission and the Government of Sweden.

Refrigerants, Naturally

An alliance of companies - Carlsberg, the Coca Cola Company, IKEA, Mc Donald's Corporation, PepsiCo and Unilever - is promoting a shift in point-of-sale cooling technology in the food and drink, food service and retail sectors towards alternative refrigeration technology that protects the Earth's climate and ozone layer. This partnership is supported by both UNEP and Greenpeace. The US Environmental Protection Agency awarded the companies with its Climate Protection Award 2005 in recognition for their leadership in developing innovative ways to combat global warming by promoting the development of environmentally friendly refrigeration technology.

www.refrigerantsnaturally.com

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⁽¹⁾ Velders, Anderson, Daniel, Fahey & McFarland, *The Importance of the Montreal Protocol in Protecting Climate*, Proceedings of the National Academy of Sciences of the USA, vol. 104, no. 12 (20 March 2007).

⁽²⁾ Decision XIX/6, para 11(b) in UNEP/OzL.Pro.19/7 available at: http://ozone.unep.org/Meeting_Documents/mop/19mop/MOP-19-7E.pdf

⁽³⁾ UNEP/TEAP, *Response to Decision XVIII/12: Report of the Task Force on HCFC Issues and Emissions Reduction Benefits Arising from Earlier HCFC Phase-out and other Practical Measures* (August 2007)

⁽⁴⁾ UNEP press release: Ozone Treaty's Role in Combating Climate Change Tops Environment Ministers Meeting in Canada. Two Decades of Success and Future Years of Achievement Take Centre Stage at 20th Anniversary Celebrations of Montreal Protocol. Nairobi/Montreal, 14 September 2007