



SUPPLEMENTAL HISTORY AND BACKGROUND INFORMATION SUPPORTING THE JOINT NGO STATEMENT AT THE MONTREAL PROTOCOL'S 25th ANNIVERSARY CELEBRATION

**Geneva, Switzerland
11 November 2012**

Early History

The effort to phase-out ozone-depleting chlorofluorocarbons (CFCs) and other fluorinated gases started even before the Montreal Protocol was agreed in 1987, spurred by the 1974 report by Mario Molina and Sherwood Roland confirming that CFCs were migrating to the upper atmosphere and destroying the Earth's protective ozone layer. This groundbreaking work later won Molina, Roland and Paul Crutzen the Nobel Prize in chemistry. In response to the global threat identified by these scientists, environmentalists initiated boycotts of CFC-filled spray cans and the US, Canada, and several countries in Europe implemented national laws aimed at protecting the stratospheric ozone layer from the threat posed by CFCs.

Saving the Atmosphere Saves Lives

During its 25 years of operation, the Montreal Protocol has been responsible for the global phase-out of 97% of the consumption and production of nearly 100 ozone-depleting substances, and has put the stratospheric ozone layer on a path to recovery by 2065. The Montreal Protocol has prevented tens of millions of cases of skin cancer, cataracts, and numerous other environmental and health problems worldwide, and could save more than \$4 trillion in health care costs in the US alone by 2065.

Significant Contribution to Climate Protection

The Montreal Protocol met the challenge of stratospheric ozone layer protection and did even more for the global atmosphere. By preventing the equivalent of 135 billion tonnes of CO₂ emissions, the Protocol made the most significant contribution to climate protection that has been realized to date, delaying warming by 7 to 12 years. Although the 1987 treaty was designed primarily to protect the ozone layer, as early as 1975 the warming impact of CFCs was recognized and discussed by the scientists and policy professionals that participated in the negotiations. In fact, if we go back to 1974, when we were first warned by Molina & Roland about the detrimental impact of CFCs, and count the climate benefits from phasing out ODS, we see that we solved an amount of the climate problem that would have otherwise equaled today's contribution from CO₂ (about 1.6 W/m²). This is more than half of current warming.

We are proud of our collective efforts. The degree of cooperation and consensus to address ODSs is truly inspiring.

A Recipe for Success

In phasing out ODS, the Montreal Protocol has achieved a degree of success in global environmental protection that no other environmental treaty has been able to realize. This has been achieved by fully implementing the principle of common but differentiated responsibilities. The Protocol Parties agreed that developed countries should go first in undertaking control measures and developing safer substitutes, with

developing country commitments starting after a grace period of typically ten years. To support the developing countries in meeting their commitments, a dedicated funding mechanism, the Multilateral Fund, was established and funded by developed countries to pay the full, agreed incremental costs of phasing out ODS and to assist with technology transfer and other capacity building needs.

Another important feature is the Montreal Protocol's 'start and strengthen' approach. Throughout its 25-year history, the Protocol has started by addressing a problem, learned-by-doing, gained experience and confidence, and then done more. This approach has helped build confidence among Montreal Protocol Parties, their industries, and other stakeholders to facilitate the speedy development and deployment of new technologies that make action easier and cheaper, and to build the momentum and political will to do more. For these reasons the Montreal Protocol enjoys universal participation by all UN member States, for a total of 197 Parties.

Chemical Companies and the Montreal Protocol

To a large extent, the ozone crisis was the unintended byproduct of the use of fluorocarbon CFCs refrigerants and foaming agents. While industry initially strove to delay regulatory controls, once the scientific evidence became irrefutable, governments and industry were compelled to take action. The fluorocarbon companies quickly put forth new generations of fluorocarbons (HCFCs and HFCs) as replacements. These substances, though not environmentally sustainable in the long term, were instrumental in reducing the volume of ozone depleting and climate warming refrigerants and foaming agents being emitted. However, environmentally safer, not-in-kind technologies could have been applied sooner in many sectors where fluorocarbons ended up being the standard.

Unfinished Business

While we have much to be proud of, now is not the time to rest on our laurels. Despite the tremendous success of the agreement thus far, there is still more that the Montreal Protocol can and should do to protect the global environment. If anything, the stakes are even higher than they were when we started, and the need for fast action is even more imperative.

One piece of old business is ODS banks. Emissions from banks occur in addition to emissions during production and consumption, but often at a much later date, and are therefore not regulated under the Montreal Protocol. Although the Parties have taken first steps toward developing a comprehensive program to recover and destroy banks of ODSs, and have directed the Ozone Secretariat to explore a variety of strategies to manage ODS banks, a comprehensive program to recover and destroy banks has not yet been agreed. And in the meanwhile, the ODSs are leaking irreversibly into the atmosphere.

Even more pressing are the rapidly growing emissions of hydrofluorocarbons (HFCs). HFCs do not deplete the stratospheric ozone, but are instead super-greenhouse gasses. The current mix of HFCs in use today have an average GWP of 1600 times that of CO₂. Due to their use as replacement for the ODSs being phased out under the Protocol, HFCs are the fastest growing greenhouse gas in the United States and many other countries, growing globally at a rate of 10-15% annually. In coming decades, as the remaining HCFCs are phased out, much of the market for refrigerants and thermal-insulating foam production will be met by HFCs unless fast action is taken to avoid and reduce them.

In 2000, the production, emission, and radiative forcing of HFCs was less than 1% of the total forcing from long-lived greenhouse gases. Without fast action to limit their growth, the climate forcing of HFCs could increase from 0.012 W/m² in 2010 to as much as 0.40 W/m² in 2050. Assuming no action is taken to mitigate HFCs, HFC forcing will equal approximately 20% of CO₂ forcing by 2050, about the same as current annual emissions from transport, or up to 40% of CO₂ forcing under a scenario where CO₂ concentrations are limited to 450 ppm.

In the end, it is the Montreal's actions to save the ozone layer that are driving the explosive growth in the use of HFCs as replacements. And it is the Montreal Protocol that has the means and the responsibility for phasing down HFCs to protect the climate.

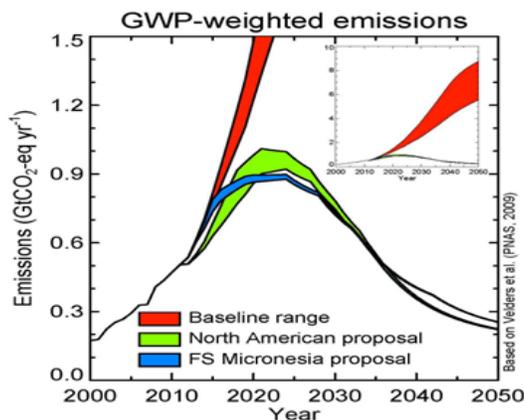
Without fast action under the Montreal Protocol, growth in HFC emissions will offset all of the climate benefits the Protocol has worked so hard to provide over the past 25 years.

A Time to Celebrate and a Call to Action

As we celebrate the 25th anniversary of this incredible environmental treaty we must recognize that truly celebrating the successes of the Montreal Protocol means ensuring that it continues to do what it has been doing so well for the past quarter century—protecting the global atmosphere.

For the past three years the Federated States of Micronesia and a North American coalition made up of the US, Canada, and Mexico have proposed amendments to the Montreal Protocol that would phase-down HFC production and use by 85-90%, offsetting an estimated 86-146 billion tonnes of CO₂ equivalent HFC emissions by 2050. The TEAP has already identified many technically and economically feasible options to achieve these first control steps and while substitutes in some sectors are still being developed, climate friendly substitutes for high-GWP HFCs are already in commercial use in many sectors.

Cumulative Decrease of Direct GWP-Weighted Emissions of HFCs under the Proposed Micronesian and North American Amendments to the Montreal Protocol



The North American proposal and the Micronesian proposal are similar; both decrease the cumulative (2013-2050) direct GWP-weighted emissions of HFCs to 22-24 GtCO₂-eq from 110-170 GtCO₂-eq, for a total of ~87 to 146 GtCO₂-eq in mitigation. This is equivalent to a reduction from projected annual emissions of 5.5 to 8.8 GtCO₂-eq/yr in 2050 to less than ~0.3 GtCO₂-eq/yr. Prepared Dr. Guus Velders, based on Velders G. et al., The large contribution of projects HFC emissions to future climate forcing, PNAS (2009).

While efforts to agree to the amendments have thus far been delayed, momentum is building. At the Montreal Protocol Meeting for the Parties in Bali in 2011, of the nearly 130 parties in attendance, 108 signed the Bangkok Declaration calling for low-GWP alternatives to CFC and HCFC. In June 2012 the United Nations Conference on Sustainable Development, attended by more than a hundred heads of state, supported “a gradual phase-down in the consumption and production of hydrofluorocarbons.”

Phasing down HFCs under the Montreal Protocol is an opportunity to address one of the fastest growing threats to the climate using a treaty that has proven time and again that it is fair, fast, and effective.

References

1. US EPA, *The Benefits and Costs of the Clean Air Act, 1990 to 2010, Stratospheric Ozone Assessment*, EPA Report to Congress, Appendix G, pg. G-16, G-22 (1999), available at: http://www.epa.gov/air/sect812/1990-2010/ch_apg.pdf.
2. Velders, G.J.M. *et al.*, *Preserving the Climate Benefits of the Montreal Protocol by Limiting HFCs*, SCIENCE (2012), available at: <http://www.sciencemag.org/content/335/6071/922>.
3. Velders, G.J.M. *et al.*, *The large contribution of projected HFC emissions to future climate forcing*, PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES (2009), available at: <http://www.pnas.org/content/early/2009/06/19/0902817106.abstract>.
4. Velders, G.J.M. *et al.*, *The importance of the Montreal Protocol in protection the climate*, PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES (2007), available at: <http://www.pnas.org/content/104/12/4814.abstract>.
5. Molina, M. *et al.*, *Reducing abrupt climate change risk using the Montreal Protocol and other regulatory actions to complement cuts in CO₂ emissions*, PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES (2009); available at: <http://www.pnas.org/content/early/2009/10/09/0902568106>.