Strengthening the Montreal Protocol in September to Maximize Climate Reductions

August 2007 www.igsd.org

From 1990 to 2010 the Montreal Protocol will have reduced climate emissions 135 $GtCO_2$-eq.—many times more than the first reduction target of the climate treaty. The net reduction in radiative forcing from ozone depleting substances will be about 13% of the forcing due to accumulated emissions of CO_2 from human activities, and will delay forcing by up to 12 years, allowing new technology to enter global markets. *See* attached graph from Velders, *et al*., and their article from PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, *"The importance of the Montreal Protocol in protecting climate." See* http://www.pnas.org/cgi/content/abstract/104/12/4814

The Montreal Protocol Parties can do more in the future to benefit the ozone layer and the climate system, starting in September at the 20th anniversary meeting in Montreal by strengthening the treaty in a way that supports energy efficiency and climate change objectives.

The Montreal Protocol's current climate reductions are 10-11 times more than the initial reductions mandated by the Kyoto Protocol (or 5-6 times if the 6% "Business-As-Usual" emissions growth since 1990 is included with the reduction of 1 gigaton of CO_2-eq. per year below 1990 mandated for Kyoto's initial 5-year period).

Velders *et al.* report that without the Montreal Protocol and earlier efforts to reduce CFCs that started in 1974 when Drs. Rowland & Molina first warned the world of danger to the ozone layer, ODS radiative forcing would almost have matched emissions from CO_2 by 2010. Early effective action has delayed anthropogenic radiative forcing up to 35-41 years.

The Montreal Protocol can do considerable more to reduce climate emissions in the future, as Dr. Molina recently noted in the *Financial Times of London. See* http://www.ft.com/cms/s/0/ad5a4ba2-51da-11dc-8779-0000779fd2ac.html.

Next month the Parties are considering an adjustment to accelerate the phase-out of HCFCs, which are transition chemicals that nevertheless destroy ozone and contribute to climate change (although less than the CFCs they replaced). *See* http://www.igsd.org/about/publications/FAQFinal16July.pdf.

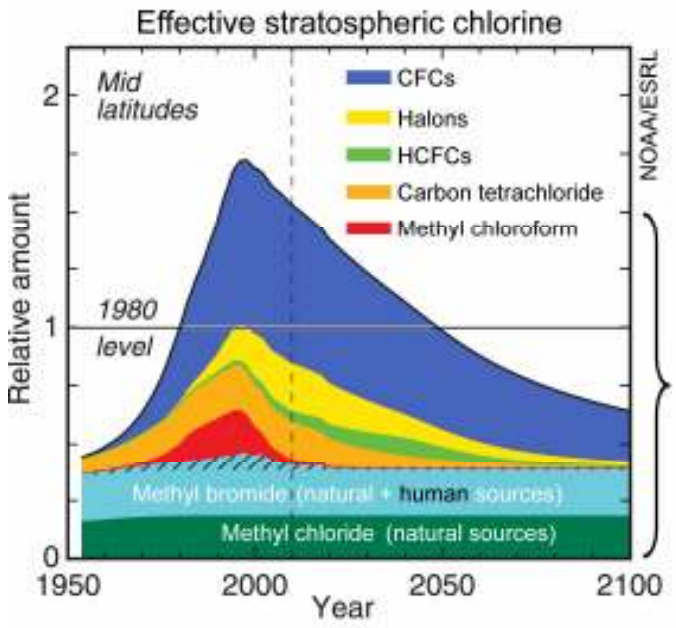
Such an adjustment will strengthen the ozone treaty in a way that can reduce climate emissions by an additional 17.5-25.5 $GtCO_2$-eq. by 2050—several times the climate treaty's initial reductions—assuming the transition out of HCFCs is carefully managed to ensure zero or low GWP substitutes. Nine Parties—Argentina-Brazil, Mauritius, Micronesia, Mauritania, Norway-Switzerland-Iceland, and the U.S.—have submitted six proposals for such an adjustment.

The G8 also is supporting such an adjustment. The 7 June 2007 *G8 Summit Declaration* committed to "accelerating the phase-out of HCFCs in a way that supports energy efficiency and climate change objectives," further noting that "Improving energy efficiency worldwide is the fastest, the most sustainable and the cheapest way to reduce greenhouse gas emissions and enhance energy security…." (*Summit Declaration*, at para. 59 & 46.) *See* http://www.whitehouse.gov/g8/2007/g8agenda.pdf

A growing number of developing and developed country Parties—including Argentina and Brazil, along with the US and the EU—believe action is needed next month in Montreal, especially as there may be as little as 10 years until the "tipping point" for abrupt climate change, including severe sea-level rise. *See* http://www.igsd.org/about/publications/FAQFinal16July.pdf; and http://www.iop.org/EJ/article/1748-9326/2/2/024002/erl7_2_024002.html. Success in September can provide insurance against abrupt climate change, and give the world more time to negotiate the post-Kyoto climate agreement.

February 2007

The dual benefit of the Montreal Protocol: Ozone and climate protection:

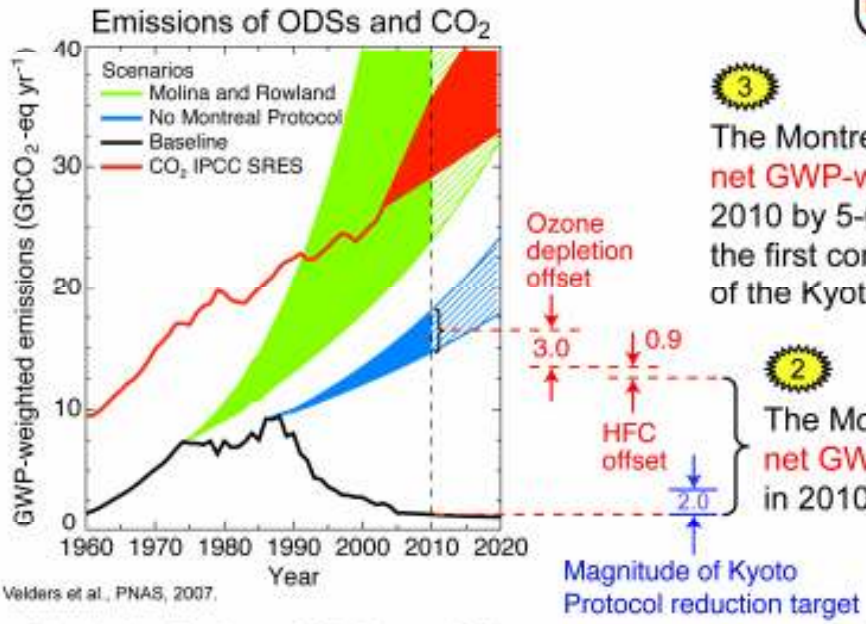


1

The Montreal Protocol has slowed and reversed the accumulation of ozone depleting substances (ODSs) in the stratosphere as measured by effective stratospheric chlorine amounts.

Scenarios

- Baseline ODS conditions as measured in the past and projected for the future.
- ODS projections for a world with no regulations from the Montreal Protocol.
- ODS projections for a world with no early warning by Molina and Rowland in 1974.
- IPCC SRES results for CO_2 in the past and projected for the future.



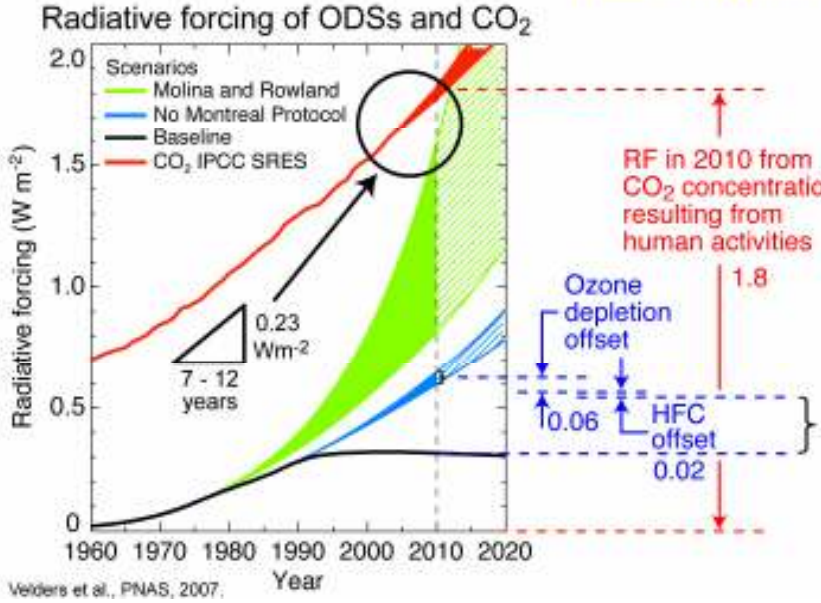
Velders et al., PNAS, 2007.

3

The Montreal Protocol will have reduced net GWP-weighted emissions from ODSs in 2010 by 5-6 times the reduction target of the first commitment period (2008-2012) of the Kyoto Protocol.

2

The Montreal Protocol will have reduced net GWP-weighted emissions from ODSs in 2010 by about 11 Gt CO_2-eq yr^{-1}.



Velders et al., PNAS, 2007.

5

The Montreal Protocol net reduction in ODS radiative forcing in 2010 will be equivalent to about 7-12 years of growth in radiative forcing of CO_2 from human activities.

4

The Montreal Protocol will have reduced net radiative forcing from ODSs in 2010 by about 0.23 Wm^{-2}, which is about 13% of that due to the accumulated emissions of CO_2 from human activities.

D. Fahey, NOAA/ESRL