AN UNPARALLELED OPPORTUNITY FOR COPENHAGEN

ELIMINATE HFCS

Halogenated gases currently contribute 12% to overall radiative forcing.[1] While actions under the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) are already addressing CFCs and HCFCs, atmospheric concentrations of some HFCs (hydrofluorocarbons) are rising rapidly, by more than 23% each year.

A global agreement to phase out HFCs under the Montreal Protocol is an immediately achievable, cost-effective rapid action with enormous and unrivalled near-term greenhouse gas mitigation potential. The Montreal Protocol is a proven model working in the industrial sectors that produce HFCs, and has the necessary institutions in place to enable rapid and effective technology transfer in developing countries.

It is essential that a decision to agree to take appropriate measures under the Montreal Protocol to reduce HFC production and use be part of the Agreed Outcome in Copenhagen.

Recent scientific and governmental reports clearly indicate that acute climate change will occur absent substantial mitigation of anthropogenic greenhouse gas ("GHG") emissions. These reports illustrate that both the onset and the severity of climate change have been underestimated. As a result, projected temperature increases, sea level rise, glacial melt rates and other climate change indicators are being consistently revised to reflect the accelerating pace of observed and projected change.[2]

The best available prospect for achieving significant near-term climate mitigation—the lowest hanging fruit— is a phase-out of HFCs under the Montreal Protocol. With global warming potentials (GWP) hundreds to thousands of times greater than carbon dioxide (CO_2), HFCs are often referred to as 'super' greenhouse gases and are primarily produced for use in refrigeration, air-conditioning, and foam-blowing.[3]

Based on current proposals to the Montreal Protocol, phasing down HFCs could prevent emissions of more than 140 gigatonnes of CO_2 equivalence (GtCO2eq.) between 2013 and 2050, equivalent to almost five years of current global CO_2 emissions.[4]

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THE GROWING THREAT OF HFC EMISSIONS

While cutting CO_2 emissions from the combustion of fossil fuels is essential, the full benefit of these reductions will not be felt for centuries due to the long atmospheric life of CO_2.[5] However, concerted action to avoid the emissions of gases other than CO_2 provides a real opportunity to measurably slow the pace of climate change.

Although still a relatively small percentage of GHG emissions when compared to CO_2, emissions of HFCs are rising at alarming rates as they are used to replace ozone depleting CFCs, halons and HCFCs being phased out by the Montreal Protocol. With the phase-out of HCFCs scheduled for completion by 2031 and the explosive growth in global demand for refrigerants, left unchecked, HFC growth will counteract efforts to abate climate change through reductions of other GHGs.

According to the latest assessment from the Intergovernmental Panel on Climate Change (IPCC), atmospheric concentrations of HFC-134a, the most widely used HFC, increased on average by more than 23% each year between 1998 and 2005.[6] A further dramatic surge in HFC production is expected in the next few years due to soaring market demand within developing countries together with their commitments to phase out HCFCs beginning in 2013.[7]

Recent estimates project that HFC emissions will increase to between 3.6 and 8.8 $GtCO_2eq.$ per year by 2050. The higher end of these projections means that HFC emissions will equal 19% of all predicted CO_2 emissions in 2050 in the absence of a CO_2 stabilization target.[8]

The three most abundant HFCs (HFC-134a, HFC-125, and HFC-143a) have atmospheric lifetimes of 14, 29, and 52 years, respectively, and significantly greater 20-year GWPs than 100-year GWPs.[9] As such, fast action to prevent an escalation of HFC emissions will provide significantly more near-term climate mitigation than is apparent under current methodologies for calculating CO_2 equivalence based on a 100-year GWP.[10]

MONTREAL PROTOCOL AVAILABLE TO TAKE IMMEDIATE ACTION ON HFCs

During the past 20 years, the Montreal Protocol has implemented the type of multifaceted and comprehensive technology transfer envisioned by the UN to effectively assist developing economies in achieving dramatically lower GHG emissions. Capacity building, policy and regulatory reforms, demonstration of alternative technologies, as well as full incremental funding are all essential parts of the Montreal Protocol's approach to technology transfer.[11] The Montreal Protocol's robust and equitable technical and financial mechanisms have already been proven in precisely the same industrial sectors that now use HFCs, as evidenced by the successful phase-out of more than 95% of 97 chemicals in developed countries and 50-75% in developing countries.[12] With these institutions in place, and the widespread availability of low-GWP alternatives, the Montreal Protocol stands ready to replicate this success with the phase-out of HFCs and demonstrate the transfer of clean technologies to developing countries.

COST-EFFECTIVE AND EQUITABLE SOLUTION TO HFCs

An HFC phase-out under the Montreal Protocol could be achieved at significantly lower cost than a UNFCCC arrangement utilizing the Clean Development Mechanism (CDM). In fact, an HFC phase-out under the Montreal Protocol is one of, if not the most economical GHG mitigation option available to policy makers.

The Montreal Protocol pays for the incremental costs incurred by developing countries when phasing out chemicals through an established and proven fund, known as the Multilateral Fund (MLF). Payments into the MLF by industrialized countries are mandatory and based upon the UN scale of assessment. This funding for transition costs is distributed through the MLF's Executive Committee, within which voting power is equally shared between developed and developing countries. The Montreal Protocol's Multilateral Fund is generally viewed positively by developing countries and has served as a basis for the G-77 and China's submissions within the climate negotiations regarding the establishment of a new financial mechanism.[13]

From 1990-2010, the Montreal Protocol will have avoided net GHG emissions of approximately 134 $GtCO_2eq.$ delaying climate change by up to 12 years at a cost of less than $0.02 per tonne of CO_2 equivalent.[14] Although phasing out consumption and production of HFCs may be more expensive than past phase-outs (of Ozone Depleting Substance–ODS), it will still provide climate mitigation at a fraction of the cost of other measures and will be far more cost-effective than regulating HFC emissions.

GLOBAL HFC PHASE-OUT SUPPORT INCREASING

In May 2009, the Federated States of Micronesia and Mauritius submitted a proposal to amend the Montreal Protocol in order to regulate and phase down HFCs. Four months later, Mexico, Canada and the United States of America (USA) submitted an alternative HFC phase down proposal. Both proposals entail a series of step-wise reductions in consumption and production of HFCs, with more lenient schedules for developing countries. Both proposals deal with the HFC-23 by-product issue by making HFC-23 abatement mandatory for HCFC-22 manufacturers.[15]

The amendments were discussed at the 2009 November Meeting of the Parties in Egypt, but tabled until next year to allow Parties to evaluate the proposals, assess the availability

of HFC alternatives, and await developments in the broader UNFCCC climate negotiations. However, there is widespread and growing support for the Montreal Protocol to phase down the consumption and production of HFCs. At the conclusion of the Meeting, 41 countries endorsed a *Declaration on High-GWP Alternatives to ODS* urging action under the Montreal Protocol to reduce HFCs, and stressing the need to "*...review the possibility of appropriately amending the Montreal Protocol to include a progressive reduction of the production and consumption of select high-GWP alternatives to ODSs as controlled substances, and to ensure appropriate coordination with the UNFCCC and Kyoto Protocol...*".[16]

CDM IS NOT A SOLUTION FOR HFCs

The Clean Development Mechanism (CDM) has been an integral tool for achieving GHG reductions under the Kyoto Protocol since the CDM Executive Board approved the first project in late 2004. The CDM provides flexibility for industrialized countries to achieve emissions reductions by allowing certified emission reduction (CER) credits (one for each equivalent tonne of CO_2 removed by approved emission-reduction or removal projects in developing countries) to be applied to the country's reduction requirements. Approved projects must encourage sustainable development through the adoption of cleaner energy sources or more efficient industrial processes, while also contributing to stabilization of GHG concentrations in the atmosphere.[17] Projects approved by the CDM have to be "additional" to domestic actions that would have occurred in the natural course to reduce GHG emissions.[18]

As of November 2009, the CDM had registered 1,909 projects and is anticipated to produce CERs amounting to more than 2.9 $GtCO_2$-eq. in the first commitment period of the Kyoto Protocol, 2008–2012.[19] Unfortunately, to date the CDM has been dominated by projects to abate HFC-23, an unwanted by-product in HCFC-22 production. The extremely high GWP of HFC-23 has meant that abatement projects generated enormous amounts of credits at extraordinarily low costs. **While the average cost of abatement is estimated to be around $0.20 per tonne of CO_2eq. abated, CERs have sold for around $15 per tonne.[20] The massive profits secured from HFC-23 destruction have created perverse incentives to produce more HCFC-22 than needed to create even more HFC-23 and produce even more CDM CERs.[21]**

During the first commitment period of the Kyoto Protocol, just 0.45 $GtCO_2$-eq. of HFC-23 will be destroyed in CDM approved projects, at an estimated cost of $6.75 billion.[22] Aside from concerns over perverse incentives and additionality, it is clear that the CDM is an inefficient, incomplete and unnecessarily expensive means of reducing HFC-23 emissions in developing countries.

The problems with HFC-23 under the CDM place serious doubts on the ability of the CDM to control industrial gas emissions. Recognizing the threat posed by cheap HFC-related CERs, the Executive Board of the CDM has now imposed severe limitations that effectively place a moratorium on the eligibility of HFC-23 destruction projects set up after 2000.[23]

HFC-23 emissions continue to be a major problem. HCFC production in developing countries has risen at an average rate of 17.5% per year since 2000. The majority of HCFC-22 production is not covered by CDM projects, resulting in vast quantities of HFC-23 emissions.[24] Recent findings show current HFC-23 emissions to be 0.16 $GtCO_2$-eq per year, 5 1/2 times higher than in 1990, despite implementation of CDM projects.[25]

There is an urgent need for HFC-23 emissions not covered under the CDM to be dealt with in a more efficient and cost-effective manner. The relatively low cost of HFC-23 destruction makes incremental funding through the Montreal Protocol's MLF the ideal option for preventing HFC-23 emissions in developing countries.

DELIBERATELY PRODUCED HFCs IN THE CDM

Unlike the enormous profits made on historic HFC-23 projects, there is no opportunity to make windfall profits on new HFC CDM projects that convert HFC-based refrigeration, air-conditioning or foam blowing technologies into low-GWP alternatives. HFCs in these projects are deliberately produced, and are not waste products. Under CDM additionality rules, a project to avoid the use of deliberately produced HFCs would only be applicable if it can be demonstrated that it is a "first of its kind" project, which is increasingly interpreted to mean that the new technology that will be used to transition from HFCs to low-GWP alternatives have less than 10-15% market penetration.[26]

So far, only three types of projects have been approved by the CDM to transition deliberately produced HFCs to low-GWP substitutes. Of these, only one is large scale (i.e., projected to save more than 60 ktCO_2eq. per year) and only one of the approved types of HFC transition projects, which avoids the use of HFCs in polyurethane foam, has been operationalized. To date, two separate projects attempting to use low-GWP HFCs have been registered, which combined are expected to generate about 46,000 CERs per/yr.[27]

In light of the above, it is extremely unlikely that deliberately produced HFC projects will generate either large numbers of CERs or high profits for the companies involved. The key point to take away from this is that CDM could be a useful tool to help foster the transition from HFC-based technologies on a small scale, but an industry-wide phase-out under the Montreal Protocol is required to genuinely address the projected massive increase in HFCs.

RECOMMENDATIONS

In July this year, G8 leaders made a commitment to take action to reduce HFC emissions. This commitment should be honored through decisive action this year. While full agreement in Copenhagen on a legally binding and comprehensive climate treaty may not be achievable, requesting that the Montreal Protocol take immediate action by implementing a phase-out of the production and consumption of HFCs is achievable–and the best available prospect for immediate climate mitigation.

At the recent climate talks in Bangkok, enabling text on HFCs was introduced calling for the adoption of appropriate measures under the Montreal Protocol to reduce production and consumption of HFCs. This text (Paragraph 57 of the LCA negotiating text) agrees that the Montreal Protocol can begin work on addressing the technical, legal and financial issues of an HFC phase-out. **EIA recommends that UNFCCC Parties:**

- **Agree to take measures under the Montreal Protocol to reduce HFC production and consumption as part of the outcome in Copenhagen;**
- **Agree to provide climate funds for an HFC phase-out to enable rapid preparatory action to be taken by the Montreal Protocol;**
- **Maintain existing CDM restrictions on new HFC-23 destruction projects;**
- **Agree to immediately fund destruction of HFC-23 emissions not currently covered by the CDM, either through the MLF or a dedicated funding source.**

The value of addressing one of the six classes of GHGs at extremely minimal cost makes this one of the single best opportunities for the nations of the world to achieve meaningful action at Copenhagen.

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EIA — WASHINGTON, DC
PO Box 53343, Washington, DC 20009, USA

TEL + 1 202 483 6621
FAX + 1 202 986 8626
EMAIL info@eia-global.org

www.eia-global.org

EIA — LONDON
62/63 Upper Street, London N1 0NY, UK

TEL + 44 (0) 20 7354 7960
FAX + 44 (0) 20 7354 7961
EMAIL ukinfo@eia-international.org

www.eia-international.org

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