



A Global HFC Phase-out: Essential Action for the Montreal Protocol

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Action to limit HFC production and use is critical to the success or failure of efforts to combat climate change.

The Montreal Protocol has been extremely successful in enabling the phase-out of ozone depleting substances (ODS). As a result of these phase-outs, hydrofluorocarbons (HFCs) have been commercialized as substitutes for ODS. The HFCs being used as ODS substitutes are powerful greenhouse gases (GHG) with global-warming potentials (GWP) hundreds to thousands of times greater than carbon dioxide (CO₂). Recent scientific evidence indicates that by 2050 annual GWP-weighted HFC emissions alone could equate to 5.5–8.8 gigatonnes of carbon dioxide equivalent (GtCO₂-eq.),¹ or 11–19% of our current global annual GHG emissions.²

The disproportionate impacts of HFCs on global warming distinguish HFCs from other greenhouse gases. It is essential that any realistic prospect for successful climate mitigation include an early and accelerated schedule for an HFC phase-down.

Failure to control the growth in HFC emissions risks nullifying other actions to control the emission of the other GHGs to combat global warming. Action must be taken now to control the global production and consumption of HFCs.

LAYING THE PATH FOR AN HFC PHASE-OUT

Many developed countries have already adopted policies which promote the use of natural refrigerants such as

CO₂, ammonia and hydrocarbons, resulting in rapidly expanding markets for these climate friendly technologies. Additionally, lower-GWP HFCs are being substituted or developed to replace high-GWP HFCs where natural refrigerants are not available for specific uses. Cost-effective, technically proven low-GWP alternatives to HFCs exist in most sectors and are widely used in European markets. A phase-out of high-GWP HFCs is not only technically feasible but it is an essential tool for many developed countries to meet their GHG emission reduction targets. Developed countries should recognise the key leadership role they need to play in ensuring fast action on HFCs.



The argument for avoiding projected growth in HFC emissions is clear; the question is how can an HFC phase-out agreement be achieved in an environmentally ambitious and equitable manner.

With the consequences of climate change increasingly apparent, the challenge for developing countries centres on allowing their economies to prosper within an increasingly low carbon regime. This task may be daunting, but leapfrogging high-GWP HFC technology to more climate friendly alternatives when phasing out existing ODS is one of the easier options available when it comes to mitigating GHG emissions and will save Article 5 (A5) countries immense costs in the long term.

The most immediate way of avoiding projected increases in HFC emissions in developing countries is to ensure that Multilateral Fund (MLF) assistance for the HCFC phase-out is directed to projects using low-GWP alternatives rather than HFCs. Developing countries have signalled willingness to avoid large uptakes of HFCs but this will require the support of the MLF. Before this can happen there is an urgent need to develop and agree on HCFC phase-out funding guidelines. It has been two years since the Parties' historic agreement to accelerate the phase out of HCFCs and yet guidelines surrounding cut-off dates and second conversions are not in place. It is clear that in order to move forward, Parties must direct the Executive Committee to agree on HCFC funding guidelines and enact a presumption against HFCs, where low-gwp alternatives exist, at the 59th Executive Committee meeting

UNLOCKING THE CLIMATE TALKS

The Montreal Protocol is the most successful multilateral environmental treaty to date and has ably demonstrated that developing and developed countries can come together to fix enormous environmental problems. This co-operative spirit is paramount in ensuring the Montreal Protocol's continued success, particularly in the field of climate mitigation and adaptation. Although climate gases, controlled by the United Nations Framework Convention on Climate Change (UNFCCC), HFCs are used as direct replacements to ODS which have been or are being phased out by the Montreal Protocol. Climate-friendly alternatives to high-GWP HFCs have been developed and proven in many sectors. There is growing consensus among Parties that the most effective means of reducing

high-GWP HFC emissions is through a consumption and production phase-down, and the Montreal Protocol's institutions, financial and technology transfer mechanisms are best suited to perform this task, while leaving HFC emissions under the purview of the UNFCCC.

Rather than considering a phase-down of production and consumption under the Montreal Protocol as taking HFCs away from UNFCCC regulation, it should be seen as a way of utilising the best aspects of the Montreal Protocol and the UNFCCC to address the massive issue of HFC emissions. Submissions by developing countries to the Ad Hoc Working Group on Long-term Co-operative Action (AWG-LCA) under the UNFCCC have suggested the need for the establishment of a multilateral fund, technical panels and use of incremental cost models.³ An agreement to phase out high-GWP HFCs under the Montreal Protocol will provide a viable example of the type of technology transfer and financial mechanisms that could be incorporated into the UNFCCC Agreed Outcome.

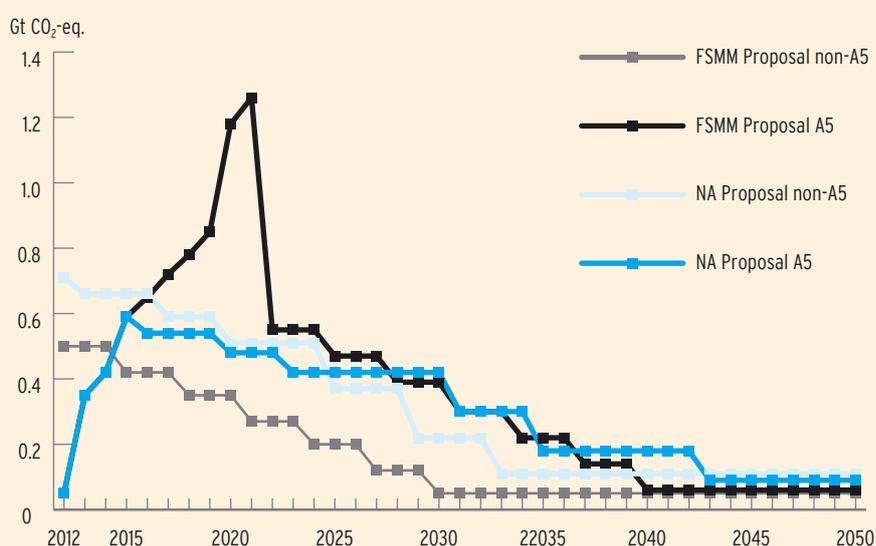
As political tension regarding the outcome of the Copenhagen climate talks grows it is more important than ever to show that the world can unite when it comes to tackling climate change. For this reason Parties must not miss this critical opportunity, before December's climate talks, to demonstrate their intent to take action on HFCs.

ANALYSIS OF PROPOSED AMENDMENTS TO PHASE DOWN HFCs

In May 2009 the Federated States of Micronesia and Mauritius submitted a proposal (henceforth known as the FSMM proposal) to amend the Montreal Protocol in order to regulate and phase down HFCs. Since the proposal was submitted, eight other countries have offered their official support. In September 2009 Mexico, Canada and the United States submitted an additional proposal to phase down HFCs (henceforth known as the NA proposal). Figure 1. demonstrates the impact these proposals would have on HFC consumption in terms of CO₂ equivalent tonnes. The graph is based on projected HFC consumption published in the Proceedings of the National Academy of Science by Velders *et al.* in June 2009, using the A2 (lower end) scenario.

The FSMM proposal leaves open the question of the phase-down schedule for A5 countries, therefore for the purposes of this comparison EIA has assumed a traditional 10-year grace period for developing countries. This is reflected in both the baseline year (i.e. an average of projected consumption from 2014-2016) and the reduction schedule. Under these assumptions the schedule allows a sharp spike in HFC consumption in A5 countries between 2015 and 2022, which would present

Figure 1. Comparison of HFC phase-down proposals



difficulties in achieving a smooth and rapid phase-down at a later date.

The NA proposal is noticeably weak in the level of ambition sought by developed countries. Due to the combined baseline, the NA proposal does not actually bring about any HFC consumption reduction from current levels until 2020. In fact it allows a more than 20% increase in consumption of HFCs in developed countries up to 2012. This weak schedule does not even match European legislation to phase down HFCs in just one sector, mobile air-conditioning. If developed countries are serious about stimulating demand for climate-friendly technologies and encouraging agreement by developing countries to achieve a global HFC phase-down then they must put forward and agree a far more aggressive schedule.

IMPACT ON HCFC PHASE-OUT IN ARTICLE 5 PARTIES

There is understandable concern that an HFC phase-down in developing countries will interfere with existing HCFC phase-out commitments, however this should not be the case. EIA analysis of the NA proposed schedule indicates that with 8% HCFC consumption growth rates up to the 2013 freeze, developing countries would still be able to meet their 10% below baseline target in 2015 if they use replacement patterns of HCFC by HFC consumption similar to those experienced in developed countries. So even under business-as-usual (BAU) replacement patterns the phase-down will not conflict with HCFC phase-out commitments. Furthermore, EIA estimates that the schedule leaves 0.162 GtCO₂-eq. allowance for stand alone expansion of HFC consumption in developing countries.

The rationale for agreeing to a global HFC phase-down is to ensure that developing countries do not make the same mistakes as developed countries by entering into an HFC cul-de-sac. An HFC phase-down schedule for developing countries should therefore be specifically designed to avoid HFC growth and therefore be much more ambitious than those currently proposed.

BASELINE

The NA proposal uses a combined HCFC and HFC baseline. This concept has merit in that it allows developing countries some leeway when phasing out HCFCs to convert to HFCs where alternatives do not exist.

There may be concern that the combined baseline does not reflect fairly on developed countries that have taken early action to reduce their HCFC consumption. While there have been suggestions that early action could be rewarded using a multiplier for individual non-Article 5 (non-A5) countries, EIA believes this could be overly complicated and result in intense negotiations which would delay adoption of any agreement. It may therefore be more straightforward to simply use an HFC-only baseline for 2004-2006 for developed countries.

EIA strongly advocates that regardless of whether an HFC or combined HCFC/HFC baseline is used, Parties agree baselines using data from past years, to guard against an inflation of the existing growth rate in anticipation of an approaching baseline date. This occurred before the setting of the CFC baseline, with production estimates in some countries showing a conspicuous 'bump' shortly before and during the baseline years.

GRACE PERIOD

Traditionally the Montreal Protocol has given developing countries a 10 year grace period, the rationale being to allow time for alternative technologies to be developed and implemented in non-A5 countries before being transferred to A5 countries. However the long time period often meant that developing countries were offered outdated, unsustainable, technologies no longer in demand in non-A5 countries. Furthermore traditional views of 'developed' and 'developing' nations are evolving, as several developing countries have proven their innovative and technological prowess. In line with these shifting circumstances it makes sense for developing countries to be at or closer to the forefront of sustainable technological innovation.

A significantly shorter grace period will ensure that developing countries are not encumbered with environmentally damaging HFCs but instead are able to adapt quickly to the need for more sustainable technologies.

POTENTIAL EMISSION REDUCTIONS

Table 1. estimates that between 2013 and 2050 the NA proposal could save almost 100 GtCO₂-eq. in A5 countries and 24 GtCO₂-eq. in non-A5, while the FSMM proposal shows similar reductions in A5 countries (approximately 98 GtCO₂-eq.) and greater savings in non-A5 countries (almost 29 GtCO₂-eq.).⁴

These emission reductions are clearly enormous, more than twice current annual emissions which are estimated at 47 GtCO₂, and can play an important contribution to global efforts to mitigate climate change.

THE NEED FOR DATA

There is a clear need for the TEAP to agree datasets of HFC current and projected consumption and production. Estimates of potential reductions and baselines under phase-down scenarios very much depend on the data used.

For example, the data used in an analysis by the US EPA of the NA proposal varies considerably from the data published in PNAS by Velders *et al.* US EPA baseline levels are more than 20% higher than baselines calculated by EIA using PNAS (Velders *et al.*) data. US EPA calculates baselines of 731 and 883 million tonnes CO₂eq. for A5 and non-A5 Parties respectively under the NA proposal, compared to EIA's baselines of 605 and 735 million tonnes CO₂eq.

The US EPA data projects much lower HFC consumption and production in A5 countries and higher growth in non-A5 countries. Accordingly, the US EPA analysis shows drastically lower potential emission reductions in A5 countries (40.5 GtCO₂eq.), and higher reductions in non-A5 countries (up to 42.9 GtCO₂eq.).

Table 1.
Estimated cumulative reductions in HFC consumption 2013 to 2050 (GtCO₂eq.)

	Article 5 countries	Non-A5 countries	Global
FSMM proposal	97.83	28.86	126.69
NA proposal	99.68	23.67	123.35

CONCLUSION

In light of the vast scope and magnitude of the escalating threats posed by climate change and the inherent difficulties involved in achieving a global agreement for climate change mitigation, it is imperative that Parties to the Montreal Protocol move decisively to take action on HFCs.

EIA's analysis of proposed HFC phase-down schedules reveals the need for a much higher level of ambition from both developed and developing countries if dangerous global warming tipping points are to be averted in the near future. It is imperative that Parties recognise the essential role the Montreal Protocol has in both mitigating HFC emissions and inspiring the level of ambition urgently required in wider negotiations on climate change.

RECOMMENDATIONS

At the 21st Meeting of the Parties to the Montreal Protocol, EIA recommends that Parties:

- **Agree to a phase-out of high GWP HFCs in an environmentally ambitious manner;**
- **Ensure that any phase-down schedule should use a baseline based on data from past years and avoid a 'spike' of growth in developing countries;**
- **Instruct TEAP to prepare HFC production and consumption data of A5 and non-A5 countries and future projections;**
- **Instruct TEAP to analyse sectors where HCFCs can be phased out without using high-GWP HFCs;**
- **Adopt a presumption within the Executive Committee against HFCs where alternatives exist;**
- **Agree on HCFC phase-out funding guidelines surrounding cut off dates and second conversions.**

REFERENCES

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3. G77 & China's UNFCCC submission on technology transfer mechanisms to the AWG-LCA included the establishment of a Multilateral Climate Technology Fund, Technical Panels and incremental cost funding for creation of manufacturing facilities for environmentally sound technologies and procurement of low GHG emission technologies as well as full cost funding for capacity building, including institutional strengthening.
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