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END IN SIGHT FOR HFCs

How technology transfer under the Montreal Protocol can help close the gigatonne gap

Parties to the UNFCCC are currently discussing initiatives to address the pre-2020 ambition gap under the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP). One initiative being discussed is the phase-down of the "super greenhouse gases" HFCs (hydrofluorocarbons) under the Montreal Protocol. By using the Montreal Protocol to remove one of the major sources of greenhouse gas emissions, Parties could avoid more than 95 billion tonnes of CO_2e by 2050, but they must act now.[i]

WHAT ARE HFCS?

Hydrofluorocarbons (HFCs) are man-made fluorinated gases (F-gases) developed and commercialised to replace CFCs, HCFCs and other chemicals that deplete the ozone layer. Unlike CFCs and HCFCs, HFCs do not destroy ozone; however they are powerful greenhouse gases (GHGs), with global warming potentials hundreds and thousands of times more powerful than carbon dioxide (CO_2).[ii] HFCs are primarily used in refrigeration, air conditioning, foam blowing, aerosols, fire protection and solvents. Their consumption and emissions increased significantly after 1990 and is projected to continue to rise. However, climate-friendly alternative refrigerants and technologies are available, which means that HFCs can be phased-out over time.[iii] HFCs currently represent around one per cent of global GHG emissions.[iv] Although their contribution to climate forcing is still relatively small, it is expected to soar in the coming decades, with emissions of HFCs increasing at a rate of 10-15% per year.[v] Unless action is taken, global HFC emissions could reach 5.5-8.8 $GtCO_2e$ per year in 2050, equivalent to 9-19% of projected global CO_2 emissions under a business-as-usual scenario.[vi] A large share of the increase will take place in developing countries, where emissions are projected to be as much as 800% greater than developed countries' emissions by 2050.[vii]



environmental investigation agency

ABOUT EIA

EIA is an independent campaigning organisation committed to bringing about change that protects the natural world from environmental crime and abuse. As part of our work, we have undertaken groundbreaking investigations into the illegal trade in ozone depleting substances (ODS) and have been closely involved in the international ozone and climate negotiations for well over a decade.

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THE SUCCESS OF THE MONTREAL PROTOCOL

With the elimination of CFC use virtually complete, the Montreal Protocol is now phasing out the remaining class of ozone depleting substances (ODS), HCFCs. Under the Montreal Protocol, all 197 Parties have accepted firm reduction commitments. These commitments are based upon the legal principle of common but differentiated responsibilities that incorporates a grace period for developing countries. This allow them to implement mandated phase-out schedules after developed countries, in recognition of developed countries' larger historical contribution to ozone depletion and developing countries' right to continued growth and development. In addition, the Montreal Protocol has financially supported the phase-out of ODS in developing countries through developed country contributions administered by the Multilateral Fund.[viii] Since most ozone destroying chemicals are also powerful greenhouse gases, the Montreal Protocol has already made an invaluable contribution to the fight against climate change, leading to emissions reductions of **8 gigatonnes of CO_2-equivalent per year** between 1988 and 2010.[ix] According to UNEP, the avoided annual emissions of ODSs is about five times greater than the annual emissions reductions target for the first commitment period (2008-2012) of the Kyoto Protocol.[x] However, rapidly rising HFC emissions will largely negate the positive climate benefit of the ODS phase-out to date, unless action is taken to phase-out HFCs.

25 YEARS OF FINANCIAL SUPPORT AND SUCCESSFUL TECHNOLOGY TRANSFER

The Montreal Protocol has a 25-year history of providing successful technology transfer from developed to developing countries. Specifically, it helps industry replace chemicals and equipment, reorganise production processes and stimulates the redesign of products. Article 10A of the convention states:

Each Party shall take every practicable step, consistent with the programmes supported by the financial mechanism, to ensure:

a. that the best available, environmentally safe substitutes and related technologies are expeditiously transferred to Parties operating under paragraph 1 of Article 5 [Developing Countries]; and

b. that the transfers referred to in subparagraph (a) occur under fair and most favourable conditions.[xi]

Through its responsibility for ensuring technology transfer, the Montreal Protocol plays a critical role in enhancing the capacity for building and development, as well as facilitating market access for chemical substitutes and alternative technologies. As economically viable and energy efficient substitutes and alternatives already exist for the largest and most common sectoral uses of HFCs, a transition away from high-GWP HFCs could be quickly adopted and deployed worldwide.

The Montreal Protocol also deploys ozone officers at 146 national offices organised into nine networks throughout the developing world. This network of professionals implements phase-down schedules agreed to under the Montreal Protocol and efficiently utilises funding supplied by the Multilateral Fund.[xii] This existing capacity of seasoned and capable experts in the exact industrial sectors where HFCs are used, is qualified and available to successfully implement an HFC phase-down tailored to match the scale and timing of the problem.

COMMON BUT DIFFERENTIATED RESPONSIBILITIES

Parties to the Montreal Protocol have distinctive responsibilities and obligations. Developed nations are required to implement regulations years in advance of the schedule used for developing nations. This two-tier approach reduces the risk of adverse fiscal impacts by creating extended and gentler transition schedules for emerging economies. Developed nations are also obligated to contribute to financing the transitions by developing nations, assisting in technology transfer, and generally facilitating successful implementation of regulations internationally by supplying monetary support. Current proposals to phase down HFCs under the Montreal Protocol[xiii] follow this successful pattern, as shown in figure 1.

FINANCIAL MECHANISM

To assist developing countries in complying with the ODS phase-out schedule, the Montreal Protocol provides financial support through its Multilateral Fund (MLF).[xiv] The MLF covers incremental costs incurred as a result of efforts to phase down consumption and production of HCFCs, and would similarly be available to aid developing countries in financing a phase-down of HFCs. The Amendment Proposals specifically state that additional monies will be provided to the Multilateral Fund, to pay the incremental costs of an HFC phase-down incurred by developing countries.[xv] The activities approved under the MLF have helped developing countries in hard technology transfer, through direct funding to transitions of alternatives and technologies and in soft technology transfer, for example information exchange, networking, institutional strengthening, capacity-building, and training.[xvi]

Stable and sufficient funding is required for these activities, and every three years, the Parties establish the MLF budget for the next three years through contributions from over forty developed nations. The MLF is managed by an Executive Committee comprised of seven industrialised nations and seven developing countries reporting annually at the meeting of the Parties. Since the first meeting of the MLF, the Executive Committee has approved and provided approximately $3.0 billion USD for the implementation of projects including industrial conversion, technical assistance, training and capacity building.[xvii]

CONCLUSION

UNEP's *Emissions Gap Report 2012* shows that there is a gap of between 8-13 gigatonnes of CO_2-equivalent emissions ($GtCO_2e$) between the emissions reductions required to limit global temperature rise to 2 degrees centigrade by 2020 and Parties' current pledges. Parties should seize this opportunity to reduce the gap by 2.2 $GtCO_2e$ by urging the Montreal Protocol to begin phasing out HFCs. By addressing HFCs at the Montreal Protocol, Parties will save UNFCCC funding for addressing the most prevalent greenhouse gas, CO_2.

HFC Reduction Steps for Article 5 and Non-Article 5 Countries (% of Baseline)

Source: Document supplied to the thirty-third meeting of the Open-ended Working Group of the Parties to the Montreal Protocol by the United States, Mexico and Canada

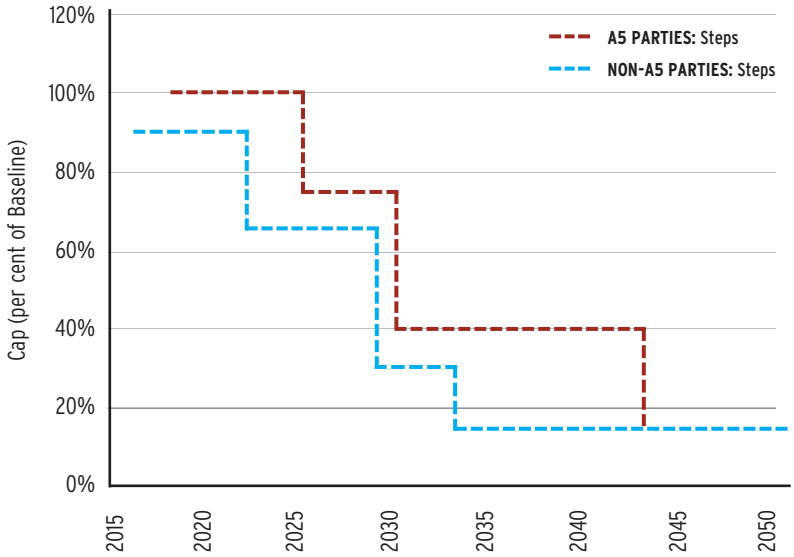


FIGURE 1: Proposed schedule for phase-down of HFCs in Article 5 and Non-Article 5 countries as per the amendment proposals from North America (Canada, Mexico and United States).

CASE STUDIES

Moving from HCFCs to low-GWP technologies in India

As a part of India's HCFC phase-out requirements under the Montreal Protocol, the MLF helped provide technology transfer in the foams sector. To achieve the phase-out India chose to convert to cyclopentane, a low-GWP technology in the largest foam blowing operations. This transition included not only the direct conversion of the foam enterprises but also training to ensure the safe handling of the new blowing agent. Since India chose to move directly from HCFCs to a low-GWP alternative, it was able to take advantage of the 25% climate benefit established by the Montreal Protocol to encourage countries to leapfrog HFCs.[xviii] In total, India received $23 million USD from the MLF to aid in this transition, with a total annual mitigation of. 1,386,597 tonnes CO_2e.[xix]

Insulation in Swaziland

With the support of the Multilateral Fund, South African refrigeration manufacturer Palfridge[xx] is phasing-out the use of HCFC-141b for the manufacture of insulation and instead is using hydrocarbons with a GWP <20 as a blowing agent. As the MLF always does with the transfer of new technology, the funding also covers training in the handling of the new alternative foam blowing agents to ensure a successful transition to this environmentally friendly alternative.[xxi]

Hydrocarbon Foam in Domestic Refrigerators

In the mid-1990s, the MLF provided funding to launch projects that introduced climate-friendly foam insulation technologies in several domestic refrigerator enterprises in Egypt, Iran and Jordan. Ten years later, the MLF began to fund the transfer hydrocarbon-based domestic refrigerator manufacturing technologies (cyclopentane and isobutane) and isobutane compressors to Chinese enterprises. At the time, this technology had not yet been applied outside of Europe, but now 85 per cent of Chinese domestic refrigerators are produced using this technology.[xxii]

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