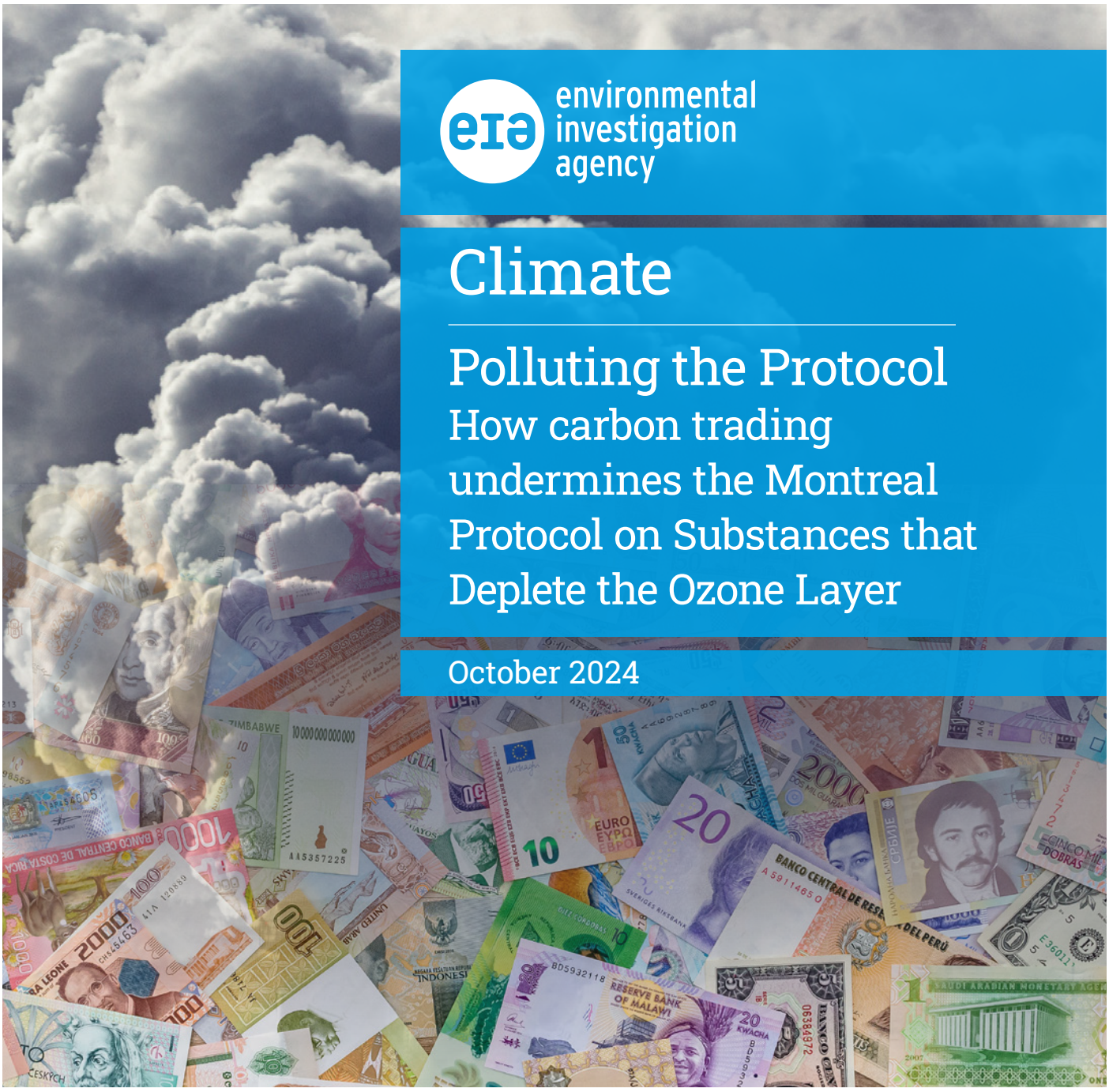


environmental investigation agency

Climate

Polluting the Protocol

How carbon trading undermines the Montreal Protocol on Substances that Deplete the Ozone Layer

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Synopsis

The Montreal Protocol on Substances that Deplete the Ozone Layer has a uniquely successful legacy. For almost four decades, the treaty has been instrumental in protecting the ozone layer and combating climate change, securing the successive phase-out of more than 99 per cent of the production of controlled ozone-depleting substances (ODS).[1]

With its focus only on controlling production and consumption, however, one question that the Protocol has never addressed is how to manage and ultimately dispose of controlled substances at end-of-life. As a result, 'banks' of controlled substances, constituting the ODS and hydrofluorocarbons (HFCs) contained in old equipment, foams and stockpiles, represent a substantial source of emissions and significant climate mitigation opportunity[2].

Since 1991, the Montreal Protocol's success has been underpinned by the provision of unparalleled, cost-effective funding under the Multilateral Fund for the Implementation of the Montreal Protocol (MLF), which has supported the implementation of the treaty's control measures in Article 5 (A5) Parties.[3] Based on aggregated disbursements of $3.63 billion through 2021, the MLF estimates it has achieved an average cost-effectiveness of $0.07 per tonne of CO_2-equivalent (CO_2-eq) emissions prevented.[4]

EIA is therefore concerned by the extent to which recent discussions within the Montreal Protocol on Lifecycle Refrigerant Management (LRM) and funding models for ODS and HFC bank management have ignored the MLF and other sustainable financing approaches, instead focusing on the generation and sale of carbon offsets by private companies.

In this briefing, EIA provides an overview of carbon trading and offsets as they relate to ODS and HFC management and destruction. In so doing, we raise numerous serious concerns, including needless damage to the climate system, derogation from the adverse effects provision (Article 2.1) of the Vienna Convention for the Protection of the Ozone Layer, the danger of perverse incentives, improper management and accounting risks relating to Montreal Protocol production controls, a variety of equity issues and privileging private rent-seeking over public benefit.

In discussing these issues, we aim to establish a clear picture of the threat carbon trading poses to the Montreal Protocol's legacy, as well as the expressed ambition of the Parties to pursue "a holistic approach to the HFC phase-down, cognisant of the triple planetary crisis."[5]

Although framed in the context of the Montreal Protocol, the concerns raised in this briefing draw lessons from the broad range of recent and historic carbon trading scandals, as well as from a host of accounting, verification, additionality, perverse incentive and other practical challenges.[6] Together, these recurring problems have made carbon offsets one of the most controversial topics in the global discourse on climate change.

We also provide more cost-effective, efficient and environmentally sound alternatives for addressing ODS and HFCs, including a global management framework, supported by a sustainable finance mechanism.

The Montreal Protocol as a climate treaty

One of the most significant legacies of the Montreal Protocol is its enormous contribution to the protection of the global climate system.

Because the chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) phased out to protect the ozone layer were also highly potent greenhouse gases (GHG), the successful phase-out of these ODS will have avoided an estimated 0.5-1°C in additional global warming by 2050, with further warming avoided by the mitigated impact of increased ultraviolet (UV) radiation reducing the amount of carbon held in plants and soils.[7]

This impressive climate mitigation legacy provided a major incentive for the Parties to adopt the Kigali Amendment in 2016, launching the global phase-down of HFCs. Even though HFCs are not ODS, the Parties made the explicit choice to augment the Montreal Protocol's climate protection legacy by phasing them down. This was due both to their high global warming potentials (GWPs) and, importantly, in recognition of the fact that their rapid and ongoing growth was a direct result of action taken under the Montreal Protocol to protect the ozone layer.[8]

Through the Kigali Amendment, the Montreal Protocol remained in compliance with Article 2.1 of the Vienna Convention by preventing adverse effects on the climate system (i.e., from greater HFC emissions) due to efforts to protect the ozone layer (i.e., the CFC and HCFC phase-outs). Overall, it is projected that the Kigali Amendment will prevent roughly 420 billion tonnes (Gt) of carbon dioxide equivalent (CO_2-eq) in HFC emissions by 2100, making it potentially the single largest climate mitigation measure ever adopted.[9]

Since the Kigali Amendment was adopted, both the Parties and the Ozone Secretariat have expressed further interest in using the treaty to deliver additional, urgently needed climate mitigation, as well as to take a holistic approach to the triple planetary crisis.[10] Meanwhile, key opportunities for the Montreal Protocol to deliver such climate mitigation have been identified, offering the collective possibility of preventing billions of tonnes of additional CO_2-eq emissions.[11]

At present, however, the Montreal Protocol risks tarnishing its legacy by failing to reject, and even potentially endorsing, carbon trading, which would result in unnecessary and environmentally harmful measures that risk exacerbating the climate challenge at a time of utmost emergency.



Above: Banks of ODS and HFCs contained in old equipment gradually leak into the atmosphere

A background to banks and credits

The challenge of ODS banks and future end-of-life emissions from refrigeration, air-conditioning and heat-pump (RACHP) equipment and foams is an issue that the Parties to the Montreal Protocol must address. CFC bank recapture and destruction, for example, is estimated by the Montreal Protocol's Scientific Assessment Panel (SAP) to be "the single most effective ozone depletion and climate change mitigation option" for controlled ODS.[12]

However, several companies are now undertaking, or proposing to fund, the destruction of ODS and HFCs by selling climate pollution permits known as carbon offsets. Because many ODS are also high-GWP climate pollutants, carbon trading companies seek to profit from their destruction by generating carbon offsets that are equivalent in CO_2 terms to the quantities of gas they destroy. They can then sell these credits to companies emitting GHGs for use as 'offsets', a preferred approach by many companies, favoured over the often more expensive but urgently needed task of reducing their own emissions.[13]

While big emitters benefit from buying carbon offsets instead of reducing their own emissions, and project developers and traders profit from selling the large number of credits generated, the communities in which credit-generating activities take place often see little of the profit, nor any contribution towards their own country's climate targets.[14]

In the end, we are left with significant amounts of climate pollution that would never have been emitted if destruction/reclamation of refrigerant gases were mandatory and appropriately supported under the Montreal Protocol, or if fluorochemical companies were required to take responsibility for the harmful substances they produced through regulatory measures such as Extended Producer Responsibility (EPR) schemes.

EIA firmly believes Parties to the Montreal Protocol can work collaboratively to establish a means of funding ODS bank recovery and destruction, and HFC bank management, without needing to resurrect and repackage their climate impact in saleable form.

With the global net carbon budget for limiting warming to 1.5°C, or even 2°C, already net negative through 2100, carbon offsets that result in no net reduction in emissions are an irresponsible approach to addressing the climate emergency. The Montreal Protocol must not turn its back on its important climate protection legacy, nor support policies that violate Article 2.1 of the Vienna Convention, by endorsing the sale of carbon offsets — climate pollution permits — to support ODS and HFC bank management.[15]

Refrigerant gas destruction as a source of carbon offsets

In the context of Montreal Protocol gases, those interested in selling carbon offsets present themselves as providing a solution to the challenges of ODS banks: how to collect and destroy refrigerant gases that could leak into the atmosphere and damage the ozone layer and/or climate system.

They also have an eye on the HFCs now being phased down, with some companies already generating highly questionable credits for HFC reclamation and re-sale based on the entirely unsupported claim that every tonne of gas recovered means a directly equivalent decrease in virgin production.[16]

Project developers generally target refrigerant gases with high GWPs, because the greater the climate impact of the gas obtained, the greater the number of carbon offsets that can be generated from its destruction or reclamation.

Most of the generated credits from ODS and HFC activities are then sold on the voluntary carbon market, where there is no central regulatory body overseeing how the collection and destruction (or reclamation) is carried out.[17] Rather, there are several 'registries' that approve their own credit-generation methodologies and act as separate platforms for credits to be bought and sold. The three primary registries for ODS and HFC credits are Verra, American Carbon Registry (ACR) and Carbon Action Reserve (CAR).[18]

Under the methodologies most often used to generate offset credits from refrigerants, the gas can come from any number of sources, including recovery from old equipment, purchase from individuals or companies or even from government stockpiles in countries eager to rid themselves of products they do not have the capacity to manage or store.

The discrepancies in cost associated with these different means of refrigerant collection – and the consistent failure by carbon trading companies to disclose such information – perpetuates a lack of transparency around what proportion of the profits generated actually goes towards financing climate action, a consistent issue across all voluntary carbon markets.[19]

Collecting stockpiles of confiscated refrigerants from national authorities, for example, requires none of the effort or costs involved in collecting refrigerants from used equipment spread around a country. In such instances, source countries typically receive no support for having managed the refrigerant, nor any other benefits from providing gases that become the source of millions of dollars in transactions. These countries and their National Ozone Units may not even be aware of the profits and climate emissions elsewhere that result from the scheme.

Crunching the numbers

To better understand the basic process, we can consider, as an example, the destruction of CFC-12. Based on the most recent SAP Assessment, the GWP of CFC-12 on a 100-year basis is 12,500.[20]

By this measure, to destroy 1 kg of CFC-12 is equivalent to avoiding the climate impact of 12,500 kg (12.5 tonnes) of CO_2 emissions. If a carbon offset credit representing one tonne of CO_2-eq sells for $20, then by destroying only 1 kg of CFC-12, the project developer could therefore generate and sell $250 of carbon offsets. At a carbon offset price of $50-100 per tonne of CO_2-eq, the revenues would be even higher, between $625-1,250 for the destruction of a single kilogramme of CFC-12.

Essentially, the higher the GWP of the gas destroyed (and the higher the market price for the offset credit), the more profitable the project is for the developer. Unfortunately, from an environmental perspective, this is only because higher GWPs lead to the generation of a larger number of offset credits that can be sold and used by companies to justify their polluting emissions.

To put this in context, Tradewater (a carbon trading company generating offset credits from the destruction of ODS collected in the US, or acquired from stockpiles in certain A5 countries) sells one CO_2-eq tonne's worth of offsetting (i.e., one credit) on its website for $19.[21] Meanwhile, Recoolit (a carbon trading company generating offset credits from the collection of ODS from old equipment in Indonesia) sells one CO_2-eq tonne's worth of offsetting on its website for $75.[22]

As neither company shares its financial information publicly, nor discloses the cost of purchasing or otherwise acquiring the ODS they destroy, it is impossible to know what proportion of their offset income goes into project operations versus profits.

Avoiding adverse environmental effects

The justification for selling carbon offset credits to fund bank management relies on a claimed climate and environmental benefit. The weakness of this claim, however, can be demonstrated by considering CFC-12 as a hypothetical example.

While there is a seemingly clear benefit from collecting and destroying a CFC-12 bank in the form of ozone layer protection, there is no net gain for the climate system. The climate harms from the destroyed gas are effectively resurrected, transferred and ensured through equivalent GHG emissions released at another location. Compounding this, the supposed ozone benefit may also be less secure than it initially seems.

According to the accounting rules of the Montreal Protocol, controlled substances that are destroyed by technologies approved by the Parties are deducted from a country's total production and consumption that year.[23] Therefore, theoretically, a country that destroys ODS to generate carbon offsets would be entitled to increase its levels of ODS production or consumption by a corresponding amount. In such an event, not only would the destruction activity fail to reduce net climate emissions but it may not even achieve the goal of reducing the net ODS emissions, instead delivering private profits for zero public benefit.

A review of the Vienna Convention for the Protection of the Ozone Layer reminds us that the original framers of the treaty were concerned, even then, about the inherent risks of trading off ozone benefits against other kinds of environmental harm. Article 2.1 of the Vienna Convention, the adverse effects provision, stipulates that Parties shall take measures to protect health and environment from adverse effects of actions taken to protect the ozone layer.[24] Critically, the definition of adverse effects that is set out in Article 1.2 of the Convention specifies that this includes adverse effects on climate.[25]

Through this provision, the Vienna Convention has direct relevance to the generation and sale of ODS carbon offsets, which are predicated on trading off a presumed ozone benefit against a clear climate harm. Endorsing activities that fund the recovery and destruction of ODS through the sale of credits that pollute the climate system clearly derogates from Article 2.1, and EIA calls on Parties to the Montreal Protocol to both recognise and prevent this.

Historically, the realisation of both climate and ozone benefits from controls under the Montreal Protocol has been the reason for the treaty's success. An offsetting approach undermines this, subverting the emerging ambition of many Parties to pursue "a holistic approach to the HFC phase-down, cognisant of the triple planetary crisis, taking account of synergies and trade-offs with other environmental challenges."[26]

At a time of keen interest in providing urgently needed *additional* benefits to the climate system, Parties to the Montreal Protocol would be wise to avoid abandoning their historically successful approach for one that makes the climate system pay – both literally and figuratively – for ODS destruction.

Perverse incentives: carbon markets can increase refrigerant emissions

A carbon crediting approach to refrigerant gas destruction also risks creating a perverse incentive which further increases overall emissions.

This is precisely what happened during the infamous HFC-23 Clean Development Mechanism scandal under the Kyoto Protocol, when additional HCFC-22 and HFC-23 by-product were manufactured simply because the payments to destroy the HFC-23 by-product were greater than the profits from producing the underlying HCFC-22.[27] The risk is similar when companies are being paid to destroy other refrigerant gases, especially those still on the market or, as in the case of HFCs, still being produced for emissive use.

When the companies producing and selling the GHGs on the market are the same companies later making additional profits from their collection and destruction, the risk of perverse incentives grows even more severe.

The same is true when companies generate offset credits from the reclamation of gases, which are then resold onto the market to be reclaimed again in the future (assuming they are not directly emitted or leaked first). If such companies can ably collect dangerous pollutants at the end of their lifetimes and efficiently destroy or reclaim them, such practices should be made a requirement for putting these dangerous products on the market in the first place.

The sale of offsets allows polluting producers to earn a second round of profits from the very feature that makes their products so dangerous, i.e., their high GWP. Instead, Parties to the Montreal Protocol would be better placed requiring refrigerants to be collected and destroyed at the end of lifetime, with no carbon offsets generated from the destruction, thus securing the benefit to the climate.

Equity issues

For project developers aiming to obtain refrigerant gases for destruction at low cost and then sell the subsequently generated carbon offsets at high margins, the potential to make a significant financial profit is clear.

This is especially true when the GWP of the gases they collect and the market price of the offset credits they sell are both high. Also clear is the financial incentive for those entities purchasing carbon offsets, since this generally costs far less than investing in actions to reduce emissions across their own supply or value chains.

It is apparent that financial incentives are compounded by fraud and a lack of transparency, as shown by recent actions taken by the United States Commodity Futures Trading Commission (CFTC), Department of Justice (DOJ) and Securities and Exchange Commission (SEC) against CQC Impact Investors LLC and its former executives for their scheme to fraudulently generate approximately six million carbon offsets.[28] The fraudulent credits related to more than 27 of CQC's projects across sub-Saharan Africa, Asia and Central America and this case highlights the ease with which private companies can profit by submitting false or misleading data to carbon registries.

Conspicuously less clear is the benefit to those A5 Parties and local communities from whom the ODS destroyed are

often collected. As noted by Carbon Market Watch, across the voluntary carbon market landscape there is simply no "clear line" drawn between what project developers tout as "benefits sharing" versus simply paying local communities for their work.[29] Significantly, the carbon trading industry has even opposed calls from the most climate-vulnerable nations asking for a guarantee that a portion of the global profits from carbon trading go towards funding adaptation where it is needed most.[30]

Like all carbon market systems, carbon trading based on refrigerant gas destruction will persist only as long as large emitters can cheaply secure the offsets they need. As private carbon trading companies exhaust comparatively cheap and accessible climate mitigation opportunities, such as refrigerant destruction, host countries are increasingly forced to undertake costlier measures in substantially harder-to-abate sectors just to meet their own domestic targets. In the case of ODS and HFC offsets, when interest in offset projects dries up, or profitability falls as lower GWP refrigerants are phased in, countries could find themselves left once again with stockpiles of harmful fluorinated gases and little means to address them.

This highlights another core critique of the carbon offset approach. While offsets are often pitched as a tool for driving investment in decarbonisation and sustainable development, the fundamental interest of the system is in fact to maintain the status quo. The system exists to allow emitters the option of paying a small cost precisely not to change the underlying activities that drive their emissions.

It is not surprising that such systems have chronically underdelivered in terms of the investment needed to drive transformational change, both at source and in the locations where the offset-generating activities take place.[31]

In fact, carbon offset schemes can delay the genuine action and investment needed to lower emissions in the very sectors that most frequently utilise offsetting approaches. They allow the emitting entities to avoid investment in reducing their own emissions and they disincentivise authorities from implementing regulatory approaches (to avoid losing 'additionality') which could result in lower overall costs and billions of tonnes fewer CO_2-eq emissions.

Alternative solutions to the challenge of refrigerant banks

The recent Technology and Economic Assessment Panel (TEAP) Task Force Report on Lifecycle Refrigerant Management made two important points.

Firstly, it highlighted that a lack of policy and enforcement makes refrigerant recovery difficult And, secondly, it stated that "effective implementation of LRM requires a comprehensive assessment of the overall costs associated with purchasing, operating, maintaining, and disposing of refrigerants throughout their lifecycle."[32]

Unfortunately, EIA did not find that the report addressed either of these points fully and, in relation to financing, focussed too greatly on carbon trading while downplaying the viability of alternative approaches including the MLF and EPR. It is worth noting too that the task force did not address the full lifecycle of refrigerants in the report, focussing on end-of-life refrigerant management and excluding entirely the production of refrigerants – which remains a significant source of both ODS and HFC emissions.

For the reasons explored in this briefing, EIA firmly believes that carbon offsets have no place in the end-of-life management of refrigerants under the Montreal Protocol. ODS and HFC carbon trading is not a solution to the issue of banks, but rather a result of the failure to implement effective refrigerant management policy sooner.



EIA urges all Parties to carefully consider their answers to the questions that the LRM Task Force correctly identified as important, namely:

- **where are effective policies currently lacking and how can these be coordinated?**
- **what would be the costs associated with a comprehensive approach to banks?**
- **what are the various options for meeting those costs?**
- **are these options environmentally sound and consistent with the provisions of the Vienna Convention and Montreal Protocol?**

Regulatory measures, many national examples of which were examined in the TEAP LRM Task Force report, offer the most efficient means of addressing ODS and HFC banks.[33]

Of the myriad national approaches explored in the report, some examples include the European Union's use of staggered bans to gradually restrict the use of F-gas refrigerants, Japan's legal requirements that users of commercial RAC recover fluorocarbon refrigerants at end-of-life (applying direct penalties on who fail to do so) and Brazil's recent requirement that whenever fluorinated refrigerants are removed from equipment they are collected and sent for reclamation or destruction.[34]

These, and the other measures discussed in the report demonstrate how direct regulation can be used to reduce and even eliminate the ongoing climate and ozone impact from refrigerant gases that are collected and destroyed. The goal of any worthwhile LRM regime should be to ensure that such measures are implemented effectively and universally.

With regard to existing banks, the Montreal Protocol has already taken the first step towards seeing cost-effective, low-harm bank management outcomes secured in A5 countries.

At the 91st meeting of the Executive Committee of the MLF (ExCom91), the fund's Executive Committee established a "funding window for the preparation of national inventories of banks of used or unwanted controlled substances and a plan for the collection, transport and disposal of such substances, including consideration of recycling, reclamation and cost-effective destruction".[35]

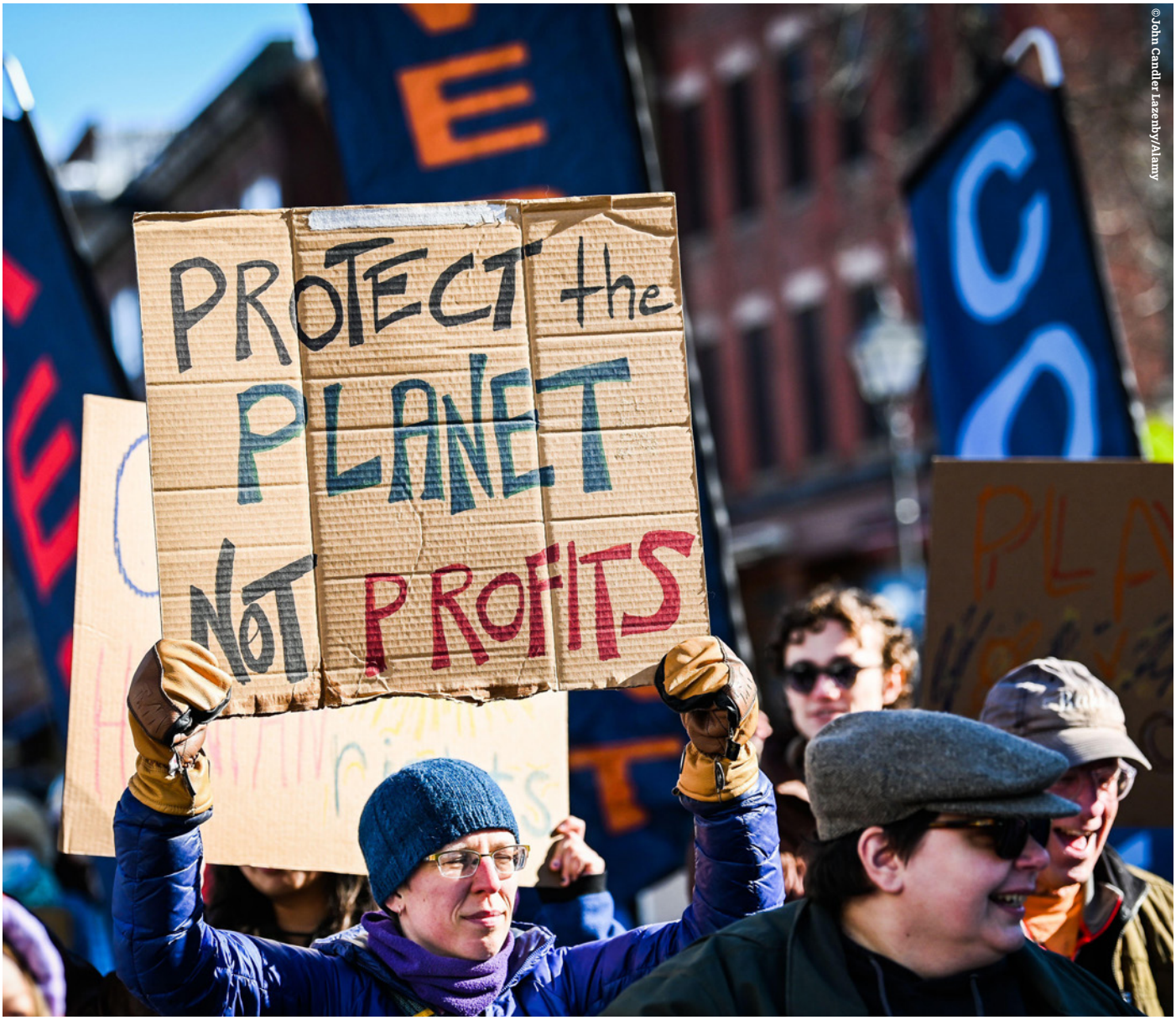
Such plans could include the development of domestic EPR schemes and regional destruction facilities, the establishment of incentive schemes to encourage refrigerant recovery or improvements to training and capacity-building related to bank management.

EIA hopes that the Executive Committee will support the implementation of these plans through a follow-up funding window, which could provide many A5 Parties with the first opportunity to secure long-term solutions to their bank management challenges.

Looking to the future, especially as regards those refrigerants still being produced, Parties to the Montreal Protocol should consider pursuing a more joined-up approach that draws on the EPR model and applies it globally. End-of-life management could be supported across all regions by including an upfront recovery fee within the original price of the refrigerant, coupled with nationally enforced requirements that the seller collects and destroys the pollutant it has put on the market. Alternatively, such an upfront fee could finance a global fund to deliver support to local management and destruction operations.

While there are several possible approaches, it is clear that a strong regulatory framework and a sustainable financing mechanism are both needed to enable developing countries to ensure the management of refrigerants throughout their lifecycles.

Recognising the significant ozone and climate harm posed by ODS and HFC banks, EIA calls on Parties to the Montreal Protocol to consider establishing a global framework for end-of-life management of refrigerant gases. This should include guidance on best practices and recommended approaches, including EPR and the other options discussed above. Importantly though, Parties must consider the principles by which these systems operate, ensuring they favour management approaches that minimise environmental harms.



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Above: Protesters during a march calling for action to combat climate change, Vermont, USA

Conclusion

The Montreal Protocol has numerous opportunities to resolve the challenge of ODS and HFC banks and to help ensure the safe management and destruction of refrigerant gases at the end of their lifetimes.

The MLF's funding window for ODS banks inventories should be just the first step in deploying the resources required to address this challenge in a cost-effective and environmentally sound manner. The next steps, as the TEAP LRM Task Force implied, should be to assess the costs and policy options for effective management of these banks.

Issuing rights to emit climate pollution equal to what is mitigated elsewhere does not prevent emissions, it merely shifts where and when they take place. In the case of ODS banks, when destruction credits are used to offset emissions sooner than the gas would have leaked, their equivalent climate harm has been effectively accelerated, exacerbating their contribution towards warming in the short-term.

In the face of the global climate emergency, government officials, business leaders and environmental advocates worldwide are fervently seeking climate change mitigation opportunities, particularly those that are low-cost and rapidly implementable. The opportunity to destroy fluorinated gases with extraordinarily high GWPs before they

leak is precisely such an opportunity. The Montreal Protocol's objective should be to facilitate the collection and destruction of these gases and to completely and permanently prevent their potential climate and ozone damage.

There is no reason to allow equivalent climate pollution back into the atmosphere, nor to deliver pollutant producers further profits from their dangerous products when they should be required to recover and destroy them.

Living up to its history of increasing ambition and its vision to accomplish more for the climate system, the Montreal Protocol community can come together once again to turn a dangerous threat into an extraordinary climate mitigation opportunity.

With a global framework of coordinated regulatory approaches backed by a mechanism for sustainable finance, the Montreal Protocol can effectively address existing banks of ODS and HFCs and future end-of-life management of refrigerant gases in a manner that – in compliance with Article 2.1 of the Vienna Convention – prevents adverse effects on the climate system.

The Montreal Protocol must secure the complete climate and ozone protections it has always achieved and continue to strengthen, rather than undermine, its tremendous climate protection legacy.

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