



crucial crossroads

The Montreal Protocol is the world's most successful environmental agreement – and not just for what it has done for the ozone layer. By 2005, its parties cut the production and consumption of all ozone-depleting substances by 95 per cent, placing the layer on a path to recovery later this century. And its phase-out of chlorofluorocarbons (CFCs) and other ozone depleting substances that are also potent greenhouse gases has also made it the world's most effective climate treaty—reducing greenhouse gas emissions by the equivalent of approximately 11 gigatons of carbon dioxide a year between 1990 and 2010, and thereby delaying the onset of climate change by up to 12 years.

One of the treaty's most important qualities—as delegates to a two-day dialogue by Parties on its future in Nairobi in May 2007 recognised—is its flexible and dynamic design, which has enabled it to respond to improvements in the scientific understanding of ozone layer depletion. Establishing assessment panels—operating on a voluntary basis with the participation

of industry, governments and academia—has, as the Protocol's Executive Secretary pointed out, given Parties access to the best available information on which to make decisions. This has improved their ability to address threats to the ozone layer promptly, even pre-emptively, by adding new chemicals when their risks are scientifically identified, as well as putting controls on ones that had never before existed.

The Protocol's Multilateral Fund, as the delegates also appreciated, is a key factor in its success. All the treaty's control measures come with a legal obligation for industrialized countries to provide financial assistance to developing ones to ensure their successful implementation. The Fund was one of the first operating financial mechanisms designed to enable compliance with international environmental treaty obligations, and its successful management has facilitated the transfer of technologies to make this possible for developing country Parties. Its support has included

establishing 140 ozone units in developing countries, helping to create regulations and legislation in over 100 developing country Parties, and setting up regional networks to support the sharing of information both on a South-South and a North-South basis. It has also undertaken an extensive effort to train key partners in the ozone protection regime, including hundreds of customs officials and thousands of refrigerant technicians in developing country Parties.

The Protocol's attention, from the outset, to compliance, through establishing a model non-compliance mechanism, has resulted in record levels of observance, with direct benefits for the ozone layer. The Secretariat reports that it has achieved and maintained a rate of reporting of compliance data of at least 99 per cent and an overall compliance rate of well over 90 per cent. It has also successfully assisted 25 Parties to return to compliance through cooperative engagement and the pointed allocation of resources. Dialogue participants acknowledged the importance of this and also pointed out that the Protocol's straightforward, command-and-control style of regulation, setting specific legally-enforceable production and consumption targets, proved that a "back to basics" approach to regulation can be the most cost-effective and expeditious way to achieve environmental protection, making the Protocol a model for international environmental governance.

And yet, as the thoughtful discussions in Nairobi made clear, the treaty is at a crucial crossroads: much has been accomplished, but much remains to be done. The public perception that the ozone layer problem has been "solved" is simply not true. Indeed it is now at its most fragile state in recorded history, leaving people and ecosystems exposed to unprecedented levels of harmful ultraviolet radiation.

The Antarctic ozone hole has reappeared each austral spring since its initial discovery, and each year it has generally grown larger and lasted longer. Though significant progress has been made in reducing atmospheric concentrations of chemicals that destroy the ozone layer, recovery is still decades away. The most recent prediction by experts delays the recovery of the ozone layer until 2049 in mid latitude areas, and until 2065 in polar regions—much later than previous estimates. This also assumes full compliance, and does not take into account illegal trade—otherwise recovery will be delayed further. The

Protocol has inadvertently encouraged the creation of a significant source of greenhouse gases. Developing countries are set to produce millions of metric tons of HCFCs over the next ten to twenty years, and their currently agreed phase-out under the Protocol is still decades away. So their unhindered growth will severely undermine the international community's efforts to address climate change.

Recognizing this threat, several Parties have put forward proposals to accelerate the elimination of HCFCs under the Protocol. Many come from developing nations which are most vulnerable to the impacts of a changing climate, including ones from small island nations, like Mauritius, Palau and the Federated States of Micronesia and from Argentina and Brazil. By acting on them, the international community can use the Protocol to make a significant contribution to the global effort to mitigate climate change. Recent estimates suggest that an accelerated phase-out could avoid the emission of the equivalent of 5 and 22 billion metric tons of carbon-dioxide. This compares favourably to the 1 billion metric tons of carbon dioxide equivalence per year in emissions reductions mandated by the Kyoto Protocol by 2012. And these estimates do not include the additional reduction in emissions that would result from unwanted byproduct emissions and improvements in energy efficiency as a result of the phase-out.

The management of 'banked' ozone depleting substances—those at present contained in products and equipment—also argues for the maintenance of the Protocol and its institutions. When equipment reaches the end of its useful life, the chemicals inside are usually released into the atmosphere. With limited incentives for their recovery and destruction, most of the ODS banked in this way will be emitted into the atmosphere over the next decade, damaging both the ozone layer and the climate. Emissions from CFC banks alone could amount to the equivalent of as much as 7 billion metric tons of carbon-dioxide by 2015—more than seven times the size of the emissions reductions initially targeted by the Kyoto Protocol.

The illegal trade in ODS now amounts to about 10–20 percent of the total trade: 7,000–14,000 tons of CFCs alone are illegally traded each year, with a value of US\$25–60 million. The problem could become even worse without sustained enforcement efforts and attention by the Parties, especially as control measures tighten.

When the Montreal Protocol was agreed twenty years ago, many believed it would be impossible to achieve the scale of reductions proposed. Others were concerned that the cost and administrative burden would be too great. Yet, thanks to thoughtful design, able practitioners and well-resourced institutions, it has performed beyond expectation, making it our most cost-effective tool for atmospheric protection.

It clearly offers a vital and unique resource for approaching problems associated with the atmosphere. Many of the non carbon-dioxide gases regulated by the Kyoto Protocol are used in applications similar to ODS—in some cases, identical to them. It stands to reason that Montreal Protocol-style regulation could meet with similar success for these gases. Besides, the complex interactions between the climate and ozone systems will almost certainly present new challenges that will require the maintenance of the expertise housed within the Montreal Protocol's technical bodies and institutions.

The remaining challenges in addressing ODS—and climate change, the greatest environmental challenge of our time—should ensure that the Montreal Protocol, its institutions and expertise, remain available and actively engaged in atmospheric protection. This will require a commitment now to revitalise and renew it.

ods by Danielle Fest Grabiell

international community must maintain its commitment to finishing the job of protecting the ozone layer.

We must also be prepared to deal with additional challenges and opportunities, especially the significant contribution that ozone-depleting substances (ODS), and some of their substitutes, are making to climate change. In the early 1990s, hydrofluorochlorocarbons (HCFCs) became the first generation of substitute chemicals for CFCs, and were added to the list of substances controlled by the Protocol. It was recognized that they were not the solution to ozone layer destruction, but had value as "transitional substances" to help the prompt phase-out of CFCs. But exponential growth in the demand for refrigerant gases worldwide has resulted in unchecked and excessive production of HCFCs. As many contribute significantly to global warming (HCFC-22, notably, is 1,700 times more effective than carbon dioxide), the