Linkages between the Montreal and Kyoto Protocols

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The Vienna Convention for the Protection of the Ozone Layer of 1985 and its Montreal Protocol on Substances that Deplete the Ozone Layer of 1987 are probably the multilateral environmental agreements that have inspired negotiations on the United Nations Framework Convention on Climate Change (FCCC) of 1992 and its Kyoto Protocol of 1997 most. This is not least because the Montreal Protocol is generally considered as one of the most successful cases of international co-operation on environmental issues. The Montreal Protocol started out in 1987 as an instrument to control production and consumption of chlorofluorocarbons (CFCs) and halons, two groups of powerful ozone-depleting substances (ODS). It was subsequently adjusted and amended four times in 1990, 1992, 1995 and 1997. Today it determines the world-wide phase-out of most known ODS of a significant potential, including also carbon tetrachloride, methyl chloroform, partially halogenated CFCs (HCFCs) and methyl bromide. By 1996, it had be successful in reducing global production and consumption of these substances by nearly 80% from the level before international controls.\(^1\)

In comparison to the mature ozone regime, the international co-operation for the protection of the Earth’s climate are still at an early stage. From the adoption of the FCCC, it took Parties more than five years to agree on the Kyoto Protocol that for the first time determines quantified emission limitation and reduction commitments of industrialised countries. These are to lead to an overall reduction of these countries’ emissions of the main greenhouse gases (GHGs) CO\(_2\), methane, N\(_2\)O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF\(_6\)) of at least five percent by 2008-2012 as compared to their 1990 levels. In addition, the Kyoto Protocol contains a number of innovative mechanisms for its implementation (emissions trading, joint implementation, clean development mechanism). However, the Protocol has neither entered into force nor is it clear when (and in which form) such entry into force might occur.\(^2\)

There are a number of linkages between the issue areas of ozone depletion and climate change. First, causes and effects of both environmental problems intersect in various ways (section 1). Second, the example of the Montreal Protocol has served as a model for the design of the international regime on climate change in many respects and is likely to do so also in future (section 2). Third and most importantly for policy making post-Kyoto, tensions exist between the two regimes, as the fluorinated GHGs that are controlled under the Kyoto Protocol are considered part of the solution of the problem of ozone depletion by many (section 3). Existing potentials for learning from the Montreal Protocol and creating synergies between both regimes have received less attention (section 4). The treaties and the treaty processes have gone some way towards managing the linkages, but especially the case of the fluorinated GHGs points to the need and opportunity for closer co-operation (section 5).

\(^1\) For the development of the Vienna Convention and its Montreal Protocol see Oberthür 1997; Ott 1998; Benedick 1998; for an analysis of production and consumption of ODS see Oberthür 1998.

\(^2\) See generally Oberthür/Ott 1999; Grubb et al. 1999.
1. **Scientific Linkages**

The relationships between the causes and effects of ozone depletion and climate change are manifold and complex, and there are both positive and negative feedbacks. To start with, chlorofluorocarbons (CFCs) and other ozone-depleting substances (ODS) like halons, carbon tetrachloride, methyl chloroform, HCFCs and methyl bromide are also powerful GHGs with Global Warming Potentials (GWP) far higher than CO$_2$ (see Table). In the 1980s, halocarbons have been found to have contributed 24% to additional anthropogenic greenhouse forcing. In addition, increased ultraviolet radiation resulting from ozone depletion can harm plants and marine species like phyto-plankton thus reducing their sink capacity for CO$_2$ and enhancing man-made climate change. Phasing out ODS under the Montreal Protocol thus also serves the objective of climate protection.

ODS have, however, also a cooling effect, since they destroy ozone in the stratosphere, which is itself a powerful GHG. This indirect effect has been estimated to offset up to nearly a half of the direct warming effect of ODS. To make things even more complicated, reduced amounts of stratospheric ozone allow more ultraviolet radiation to enter the troposphere. This eventually results in a shortened lifetime of methane, HFCs and other GHGs containing hydrogen and thus leading to reduced greenhouse forcing. On balance, ODS are, however, still contributing significantly to human-induced climate change.

GHGs, on the other hand, influence the depletion of stratospheric ozone. Apart from the role of GHGs in the chemical processes involved in the destruction of stratospheric ozone, increased CO$_2$ concentrations in the atmosphere in particular is expected to lead to a cooling of the stratosphere. This, in turn, might prolong and enhance ozone depletion which intensifies as temperatures in the stratosphere drop. As the Scientific Assessment of Ozone Depletion 1998 states, "At present, the amplitude and extent of such a cooling and therefore the delay in the recovery of the ozone layer, still have to be assessed".

<table>
<thead>
<tr>
<th>Substance</th>
<th>GWP (IPCC 1996)</th>
<th>GWP (WMO/UNEP 1998)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFC-11</td>
<td>3800</td>
<td>4600</td>
</tr>
<tr>
<td>CFC-12</td>
<td>8100</td>
<td>10600</td>
</tr>
</tbody>
</table>

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4. IPCC 1990.
5. IPCC 1996.
6. This is because increased UV radiation in the troposphere results in increased formation of OH radicals shortening the lifetime of these compounds; UNEP 1998.
2. Lessons Learned from the Montreal Protocol

Based on the close linkage between the two issue areas, international co-operation for the protection of the ozone layer, and the Montreal Protocol in particular, has constantly served as a model in the design of the international regime on climate change. This does first of all hold for the general approach towards international regulation: the FCCC and its Kyoto Protocol follow the „framework convention plus protocol“ example of the ozone regime. In addition, the Montreal Protocol has informed the design of various aspects of the evolving regime on climate change, although it might not least be its overall success and effectiveness that have prevented wider application of its lessons.

In fact, there is hardly any aspect of the FCCC and its Kyoto Protocol where the Montreal Protocol has not informed and inspired discussions on adequate design or where it has not been cited as a precedent. The list includes the financial mechanism, the procedures for reviewing and amending the treaty rules, the design of a basket of gases subject to controls, the link of policy making with scientific and technical advice etc. The most obvious example of a positive model function of the Montreal Protocol relates to its innovative non-compliance procedure. In the elaboration of the multilateral consultative process for the resolution of questions concerning implementation under Article 13 of the FCCC, the non-compliance procedure of the Montreal Protocol served as the model and the experience gained in its application since 1991 was taken into account. This has not least been based on a substantial overlap of legal experts involved in the elaboration (and application) of both procedures; see generally Szell 1995; see also Ott 1996.

Also, Article 18 of the Kyoto Protocol mandating a non-compliance procedure has been heavily influenced by the experience of the Montreal Protocol – and there is little doubt that this will also be true for the eventual elaboration of the procedure.

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\[\text{\textsuperscript{8}}\] This has not least been based on a substantial overlap of legal experts involved in the elaboration (and application) of both procedures; see generally Szell 1995; see also Ott 1996.

\[\text{\textsuperscript{9}}\] See Oberthür/Ott 1999, Part II.
Even in this most positive example of learning, the transfer of rules that have proven effective under the Montreal Protocol has sometimes been difficult exactly because they have stood the test. Parties that have not liked the climate change regime acquire just the same degree of effectiveness (because of potential negative implications of specific rules for them) have worked hard and with some success to prevent the transfer of some of the features of the Montreal Protocol into the climate change context. Linking policy making with scientific and technical advice as closely as has been done in the Montreal Protocol through the establishment of various expert panels has thus not been possible under the FCCC.\(^\text{10}\)

In summary, a long-existent linkage between the two international regimes has been the model function of the Montreal Protocol. Varying lessons have been drawn by different actors from the Montreal Protocol experience. This has not been based on any formal cooperation but has been facilitated by the large overlap of government representatives and experts involved in both processes. The Montreal Protocol thus remains one of the first reference points in developing the climate change regime.

3. **Contradictions: HFCs and other fluorinated GHGs**

The need for closer co-operation between the two treaty regimes has come to the fore with Kyoto. HFCs, PFCs and SF\(_6\) have become part of the basket of GHGs controlled by the Kyoto Protocol. Parties may thus wish to limit and reduce emissions of these gases. However, in particular HFCs have been promoted as substitutes for CFCs and other ODS. Some Parties to the Montreal Protocol and branches of the industry concerned even claim that they agreed to total ODS phase-out under the Montreal Protocol on the understanding that HFCs would be available as substitutes. Inclusion of the fluorinated GHGs in the Kyoto Protocol could thus principally delay ODS phase-out and pose compliance problems under the Montreal Protocol. Annex I Parties to the FCCC are called upon to avoid such negative effects under Article 2.3 of the Kyoto Protocol that constitutes an obligation to „strive to implement policies and measures in such a way as to minimise ... environmental and economic impacts on other Parties ...

While HFCs have been considered part of the solution under the Montreal Protocol, they are part of the problem under the Kyoto Protocol. Because of the diverging role of these substances under both treaty regimes, Parties to the Montreal and Kyoto Protocols might have to weigh the objectives of protecting the ozone layer and the climate against each other.

HFCs and, to a more limited extent, PFCs have been employed (or are expected to be employed) by both industrialised and developing countries in all major traditional ODS user sectors (aerosols, refrigeration, foam blowing, solvents, fire fighting). Of these, the refrigeration and the foam sectors are expected to rely on these fluorinated GHGs in

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\(^{10}\) On the effectiveness of the expert panel arrangements under the Montreal Protocol see especially Parson 1993.
particular. In the mid-1990s, production\textsuperscript{11} can be estimated to have been around 100,000 tonnes. Once released into the atmosphere, this amount is roughly equivalent to one percent of global CO\textsubscript{2} emissions.\textsuperscript{12} Demand for HFCs in the traditional ODS user sectors is expected to grow further as the use of HCFCs that have been applied as transitional substitutes for CFCs and other ODS is eliminated. HCFCs have an ozone-depleting potential which is lower than that of CFCs but still significant. They also have a substantial GWP (see Table). For reasons of ozone protection, consumption of HCFCs is currently scheduled to be phased out globally under the Montreal Protocol by 2040 (industrialised countries: 2030).

Depending on various factors like economic growth, technological change, policies to limit unessential uses and encourage recycling, consumption of HFCs (and PFCs) as ODS substitutes and emissions resulting therefrom might grow by a factor of between 5 and 50 from their levels in the mid-1990s. They can thus be projected to be within a range of 1-2 to 10 gigatonnes of CO\textsubscript{2} equivalents by 2100.\textsuperscript{13} This would be equivalent to between 5-10 and 50 percent of global CO\textsubscript{2} emissions in 1990.\textsuperscript{14} Global GHG emissions need to be reduced by 60-80 percent over the next century, if a stabilisation of GHG concentrations in the atmosphere is to be achieved. Measured against the remaining „environmental space“ of 20-40 percent of today’s GHG emissions, the magnitude of the challenge posed by fluorinated GHGs becomes evident.

In this respect, a substantial dispute exists concerning the net impact of HFC technology on GHG emissions. Especially the chemical industry and some HFC user industries have held that the use of HFCs enables gains in energy efficiency and thus CO\textsubscript{2} emissions in the appliances concerned that outweigh the resulting HFC emissions. However, others have pointed to the availability or the likely future availability of alternatives that are energy efficient. It would thus be possible to reduce emissions of CO\textsubscript{2} and HFCs at the same time.\textsuperscript{15}

The problem of HFC emissions might turn out to be greater than expected for two reasons. First, while use as substitutes for ODS currently accounts for nearly all HFC demand, new applications are being developed and might lead to additional consumption

\textsuperscript{11} In addition to emissions originating from use of HFCs and PFCs in certain applications, certain amounts of these substances are released into the atmosphere in the course of industrial activities (aluminium smelters; HCFC production).

\textsuperscript{12} See production figures of the most important HFC 134a in AFEAS 1998 and emissions data in FCCC/CP/1998/11 and Add.1; not all production is immediately released upon use but nearly all will be emitted eventually; only minor amounts are currently destroyed at the end of the lifecycle.

\textsuperscript{13} As the range of estimates indicates, there is a huge uncertainty involved in these projections due to diverging assumptions (and purposes of the projections) about the development of decisive factors such as economic growth, sector developments and future recycling activities; see Kroeze 1995; Fenmann 1999; Midgley/McCulloch 1999.

\textsuperscript{14} Compare UN docs. FCCC/CP/1998/11 and Add.1.

\textsuperscript{15} See, for example, the contributions to the IPCC/TEAP Joint Expert Meeting held in Petten, the Netherlands, 26-28 May 1999 (on file with author).
of an unknown magnitude.\textsuperscript{16} Second, the Global Warming Potentials (GWP) of HFCs have been revised upward in the Scientific Assessment of Ozone Depletion 1998 as compared to the figures provided by the Intergovernmental Panel on Climate Change (IPCC) in 1995 that serve as the basis of calculations under the Kyoto Protocol.\textsuperscript{17} The revised Global Warming Potentials indicate that HFCs might actually contribute about a quarter more to the climate change problematique than thought previously (see Table).

Technically, it is possible to reconcile the twin objectives of climate and ozone protection by developing and applying non-halocarbon substitutes that are already available in many applications.\textsuperscript{18} In addition to the well-known hydrocarbon technology for refrigeration and foam blowing, a number of environmentally safe alternatives have been introduced in the various sectors. Furthermore, parts of industry have engaged in developing hydrofluoroethers (HFEs) as the next generation of substitutes. Currently, the application of low-GWP HFEs appears to be possible only in niche applications. Moreover, Global Warming Potentials of these substances are, on average, still significant.\textsuperscript{19} The wider application of hydrofluoroethers might thus only shift the principal problem to another group of substances and could result in their inclusion in the Kyoto Protocol.

Even if alternative substances and technologies replace HFCs in the future, there is a potential for political quarrels that is rooted in the history of the Montreal Protocol process. Especially industrialised countries might wish to ban imports of certain products containing HFCs (such as refrigerators and foams) as this influences their HFC emissions subject to control under the Kyoto Protocol. They may be allowed to do so under international trade rules if they establish a general ban on the production of such products. Developing countries (and a number of countries with economies in transition), on the other hand, have upon the advice of OECD countries converted their CFC using sectors partly to HFC technology in the Montreal Protocol framework.

What is even more, this conversion has \textit{de facto} been supported financially by the Multilateral Fund for the Implementation of the Montreal Protocol that provides the incremental costs of projects for phasing out ozone depleting substances in developing countries (and by the GEF that has supported ODS phase-out in various countries with economies in transition). Although the part of any business producing for exports is not eligible for such assistance under the applicable rules\textsuperscript{20}, the conversion activity is generally related to the enterprise as a whole (even if funding is reduced in accordance with the exports share). Under the circumstances, industrialised countries will face political and ethical (if not legal) difficulties in restricting imports of relevant products

\textsuperscript{16} Such new applications are, for example, indicated by Forte et al. 1999.
\textsuperscript{17} See Article 5.3 of the Kyoto Protocol.
\textsuperscript{18} See the contributions to the IPCC/TEAP Joint Expert Meeting held in Petten, the Netherlands, 26-28 June 1999 (on file with author).
\textsuperscript{19} The related GWP figures given in the Scientific Assessment 1998 for various members of this class of substances range from less than 100 to more than 15,000; see UNEP 1998.
\textsuperscript{20} See Multilateral Fund Secretariat 1998.
from developing countries (and countries with economies in transition). This might be the case even if soft trade-relevant measures are taken (like labeling etc.).\textsuperscript{21}

To a limited extent, the potential conflict between the two objectives of protecting the ozone layer and climate has been addressed within the framework of the Montreal Protocol. Thus, the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol that generally gives preference to the most cost-effective solution has granted hydrocarbon technology, particularly in the domestic refrigeration sector, a special 35%-discount on the applicable cost-effectiveness thresholds since 1995 to provide for an equal footing of this alternative technology in the approval process.\textsuperscript{22} Going even further, the GEF Council in 1995 determined in its Operational Strategy that in the ozone area the GEF funds „the conversion to the technology with the least impact on global warming that is technically feasible, environmentally sound and economically acceptable“.\textsuperscript{23} Nevertheless, HFCs have continued to be used as the ODS alternative of choice in the great majority of projects approved by the Executive Committee for the refrigeration sector by the end of March 1999: of 6,377 tons of CFC-12 refrigerant to be replaced in 329 projects 5,685 were substituted with HFCs.\textsuperscript{24} The effect of the far-reaching rules of the GEF has been limited as well, as conversion to HFC technology is still successfully justified in a majority of GEF projects.

4. \textit{Potentials for Future Synergy and Learning}

The Montreal Protocol will certainly continue to function as a useful precedent with respect to many aspects of the regime on climate change. New potentials for learning from the Montreal Protocol have especially been opened up by the inclusion of the fluorinated GHGs in the Kyoto Protocol. As is the case with respect to the potential for conflict (see above), the potential for synergy springs from the closeness of the areas of production, use and trade of CFCs and other ODS and HFCs in particular. Policy making on the fluorinated GHGs may thus easily draw lessons from the experience under the Montreal Protocol in particular with regard to data collection, monitoring of emissions and effective emission abatement policies.

Parties under the Montreal Protocol have faced special challenges in collecting and reporting data on imports and exports of ODS. Under the Montreal Protocol, these data are required to calculate „consumption“ that equals production + imports – exports of

\textsuperscript{21} As an illustration, developing countries currently supply about 5-10 percent of the market of domestic refrigerators in OECD countries; personal communication of Stephan Sicars, Refrigeration Technology, May 1999.

\textsuperscript{22} See UN doc. UNEP/OzL.Pro/ExCom/17/60, Decision 17/14; also Multilateral Fund Secretariat 1998: 84.

\textsuperscript{23} See GEF 1996: 64.

\textsuperscript{24} Overall, about 6.5\% percent of all ODS to be phased out by Multilateral Fund projects (refrigeration sector: 20.7\% percent) was to be replaced with HFCs; see Pinto et al. 1999.
ODS. Only “bulk substances” are subject to phase-out and thus need to be reported. Bulk substances are not part of a ‘use system’ (e.g. a refrigerator or a fire extinguisher); they are transported and stored in containers from which they need to be transferred in order to realise their intended use. To collect the required data, Parties have relied heavily on customs statistics, organised in most countries according to the Harmonised Commodity Description and Coding System (in short, the Harmonised System or HS). The Harmonised System is elaborated in the framework of the World Customs Organisation (WCO) on the basis of the Harmonised System Convention.  

The Harmonised System is organised in 96 Chapters. These are subdivided into different Headings and Subheadings. A traded product or a class of traded products is subsumed under a specific Subheading. It may be identified by a number containing up to 6 digits, where:

1. the first two digits indicate the HS Chapter under which the product is categorised,
2. the next two digits indicate the relevant Heading, and
3. the last two digits indicate the Subheading under which the product is subsumed.

While each Party to the HS Convention has to use the agreed HS number of up to 6 digits, countries may decide to further subdivide the international nomenclature by adding more national digits. Co-operating in the framework of the WCO, the Parties to the HS Convention can recommend assigning of such national digits to specific goods. Any such recommendation is only binding to Parties that accept it. Obviously, the elaboration of the HS is motivated by the objective of catching important trade flows rather than providing a suitable framework for collecting data under environmental treaty obligations. There is a long history of co-operation between the Montreal Protocol and the World Customs Organisation to assign common customs codes to ODS in order to enable and facilitate data collection on imports and exports of these chemicals. This has proven a complicated task since the HS classifies products according to function. As a result, some ODS (or mixtures containing them) can be classified under various customs codes depending on their function. In addition, various relevant substances for which data need to be collected are at times grouped under the same code as other substances (be it ODS or non-ODS). This makes the identification of separate chemicals difficult.

These problems are compounded under the Kyoto Protocol, since actual emissions of fluorinated GHGs are subject to control and thus need to be reported (in contrast to the Montreal Protocol under which production and “consumption” as defined above are

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25 See, also for the following, UNEP 1999.
26 See various related decisions of the Meeting of the Parties to the Montreal Protocol as contained in Ozone Secretariat 1996; 1998.
27 See in general UNEP 1996.
controlled). As a result, data need to be collected not only on the production and consumption of HFCs, PFCs and SF<sub>6</sub> "in bulk", but also on imports and exports of products containing these substances because they might be emitted from such products. The list of the 'traditional' uses of ODS in refrigeration, foam blowing, solvent applications and fire extinguishers illustrates the magnitude of the task. Under the Montreal Protocol new ODS were included in the regime, which created new demand on collecting data from customs statistics. In the case of the Kyoto Protocol, the emergence of new applications of fluorinated GHGs suggests that Parties might have to deal with a 'moving target' as well.\footnote{On data collection techniques concerning HFCs, PFCs and SF<sub>6</sub> see in general Forte et al. 1999.} If customs statistics are employed for purposes of collecting and calculating emissions data of fluorinated GHGs (as one might expect given that little other data sources are available), the experiences gained in the context of the Montreal Protocol in co-operating with the WCO to find acceptable solutions will be most relevant for developing similar mechanisms under the Kyoto Protocol. There may even be scope for co-ordinating the related efforts under both Protocols (see below).

Another element of the data reporting system under the Montreal Protocol that might inspire Parties to the Kyoto Protocol and on which they might build is the Montreal Protocol data collection infrastructure and capacity that has been established over the years in particular in developing countries and CEIT. In the context of the assistance provided by the Multilateral Fund for the Implementation of the Montreal Protocol and the Global Environment Facility (GEF) through their implementing agencies (UNDP, UNEP, [UNIDO,] the World Bank), administrative units have been established and training activities conducted to enable the mentioned countries, inter alia, to collect the required ODS data through co-operation with customs authorities and relevant user industries. Much the same capacities and skills will be needed to collect data on the fluorinated GHGs, and potential for synergy and learning and applying some of the lessons learned in the case of ODS exists in that respect.

Finally, the similarity of applications of ODS and the fluorinated GHGs suggests that countries might apply similar political concepts as have proven to be effective in limiting the consumption and emission of ODS. A number of analyses that investigate and describe the policy instruments that have been employed especially by industrialised countries in the implementation of the Montreal Protocol exist. These include targeted incentives, programmes and regulations aiming at improved housekeeping and enhancing recovery and recycling, voluntary agreements with industry, trade controls, taxes and prohibitions of specific uses.\footnote{See Cook 1996; UNEP/SEI 1996; Oberthür/Pfahl 1999.} Relevant experience has been gained, and hard lessons have been learned, especially as regards the establishment of recycling and recovery schemes in developing and industrialised countries alike, with varying conditions for success depending on the national circumstances. The varying success of the application of these policy instruments in the case of the Montreal Protocol may allow to draw
lessons for the effective design of a mix of instruments for reducing emissions of fluorinated GHGs.

5. Managing Inter-linkages

Politically, the challenge posed by the scientific and factual inter-linkages between the Kyoto and Montreal Protocols consists in devising tools to resolve any potential conflicts and enable Parties to exploit the potential for synergy and learning. The following section first analyses the approaches and initiatives that have been taken so far (5.1). It goes on to explore the possibilities for alleviating the potential for conflict between the two regimes over HFCs in the context of the Montreal and Kyoto Protocols (5.2). The paper concludes by pointing to some policy options for ensuring that the available potential for mutual learning and synergy can be grasped.

5.1 The Progress so Far

To some extent, the overlap between the causes of ozone depletion and climate change has already been taken care of by the two treaty regimes. To avoid such overlap, the FCCC explicitly refers only to GHGs "not controlled by the Montreal Protocol". As a consequence, Parties to the FCCC have never undertaken to take action on any ODS which are also GHGs. This proviso has, however, neither avoided the support for HFCs under the Montreal Protocol nor has it ensured proper exploitation of potentials for synergy and learning.

The Vienna Convention and the Montreal Protocol do not contain an obligation to consider any global warming impact or other wider environmental impacts. The FCCC and the Kyoto Protocol, on the other hand, do not provide for any institutional link to the ozone regime. Also, the two relevant Secretariats have not formalised their relationship (e.g. by concluding a memorandum of understanding). Co-operation has relied upon informal mechanisms, including mutual participation in meetings and discussions. Beyond the Secretariats, co-operation and mutual learning has been based upon informal exchanges and not least the overlap of governmental and non-governmental representatives participating in both processes (see also section 2 above).

On this (non-)basis, Parties to both treaties acknowledged and started to confront the problem of conflicting approaches towards fluorinated GHGs in 1998. Upon an initiative by Sri Lanka in the framework of the Montreal Protocol, both the Meeting of the Parties (MOP) to the Montreal Protocol and the Conference of the Parties (COP) of the FCCC took decisions on the issue. First, COP 4 „encouraged“ the convening of a workshop by the Intergovernmental Panel on Climate Change (IPCC) and the Technology and Economic Assessment Panel (TEAP) of the Montreal Protocol in 1999 on available and

Footnote: This excluding proviso may also be one main reason why a Japanese initiative in Kyoto to give credit to the destruction of ozone depleting substances under the Kyoto Protocol has never made it onto the official agenda of the climate negotiations.
potential ways and means of limiting HFC and PFC emissions. On the basis of information compiled by the FCCC Secretariat from this workshop and submissions by Parties, the Subsidiary Body for Scientific and Technological Advice (SBSTA) was given the task to report to COP 5 in 1999.\[31\]

MOP 10 decided to "request the relevant Montreal Protocol bodies" (i.e. the Technology and Economic Assessment Panel (TEAP)) to convene the above mentioned workshop with the IPCC and to continue to develop information on the full range of alternatives to ODS, including solutions not involving fluorinated GHGs. MOP 10 was able to "request" TEAP to do so since TEAP is a Montreal Protocol body, which is different from the IPCC position towards the FCCC that is one of independence. TEAP will, through the Open-Ended Working Group of the Parties to the Montreal Protocol, report to MOP 11 in 1999.\[32\]

The joint IPCC/TEAP workshop took place in May 1999 and identified a number of alternative technologies to the use of HFCs and PFCs as well as numerous options for reducing their emissions from applications. The workshop results are communicated to both the COP (via SBSTA) and the MOP that will thus be in a position to take decisions on the matter in 1999.\[33\]

### 5.2 Possible Responses to the HFC Issue

There are a number of decisions that especially the bodies of the Montreal Protocol might take to alleviate the HFC/PFC issue. The first and most important one relates to the future policies of the Multilateral Fund for the Implementation of the Montreal Protocol. To minimise use of HFCs and PFCs, use of alternatives could be prescribed, prioritised or recommended. In doing so, the criteria of the Multilateral Fund could be adapted to the provisions contained in the GEF Operational Guidelines (see section 3 above). Given the limited effectiveness of the latter, the Montreal Protocol bodies could even go a step further by developing stringent criteria which must be applied in assessing „technical feasibility“, „environmental soundness“ and „economic acceptability“ in different HFC user sectors. Such criteria might then, in turn, be applied in the GEF context as well.

An open question is, however, why Montreal Protocol Parties should pay higher marginal costs for phasing out ODS per kg in cases where HFC technology is the cheapest alternative to ODS. Why would finance ministries of donor countries under the Montreal Protocol be prepared to spend more money than necessary for phasing out ODS in developing countries, if there is not even an obligation to control the use/emissions of fluorinated GHGs in these countries? There are different answers to this question. First of all, protection of the Earth’s climate is a „common concern of..."

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\[31\] See Decision 13/CP.4 of COP 4 in FCCC/CP/1998/16/Add.1.

\[32\] See Decision X/16 of MOP 10 in UNEP/OzL.Pro.10/9.

\[33\] The workshop reports to the respective bodies are currently under preparation (June 1999).
humankind“ (UNFCCC, Preamble). Thus, all countries, including the Parties to the Montreal Protocol, should be prepared to contribute to this end.

Furthermore, the industrialised countries acting as donors in the framework of the Montreal Protocol are the same countries acting as donors to the GEF that is the entity operating the financial mechanism of the FCCC. Instead of funding conversion to HFC technology under the Multilateral Fund of the Montreal Protocol first and assisting HFC phase-out in the same enterprises later on under the FCCC, resources might be allocated more efficiently by leap-frogging the HFC technology and converting to climate-friendly solutions immediately (if these are available). One way of avoiding any conflict with contributors to the Multilateral Fund might be to foster common projects of the Fund and the GEF, in which the GEF would cover any extra costs of leap-frogging HFC technology.\textsuperscript{34} If this route is pursued, the potential for conflicts about (hard or soft) trade restrictions on products containing fluorinated GHGs (see section 3 above) may be minimised.

On the side of the climate regime, the use of HFCs (and other fluorinated GHGs) in developing countries may be minimised and reduced through the emerging Clean Development Mechanism (CDM) under Article 12 of the Kyoto Protocol. Under the CDM, industrialised and developing countries can engage in joint projects in the South to reduce GHG emissions. The resulting "certified emissions reductions" can be offset against emissions in industrialised countries and may thus be used to achieve the quantified emissions limitation and reduction commitments of industrialised countries fixed in the Kyoto Protocol.\textsuperscript{35} This mechanism could, in principle, be used to convert existing HFC technology in developing countries to more climate-friendly alternatives as well as to avoid switching to HFC technology in the first place, in particular by "upgrading" planned projects under the Montreal Protocol's Multilateral Fund.

A relatively well-established system exists under the Multilateral Fund to determine the incremental costs of any such investment projects, evaluate their results and determine their impact. This could be used to determine the CDM eligibility of relevant projects, and verification, auditing and certification might also build on it and the experience and experts available. In order to make use of this system for the purposes of the CDM and to allow for any "upgrading" of projects under the Multilateral Fund to earn certified emissions reductions under the Kyoto Protocol, the relevant bodies of the Kyoto and Montreal Protocols would need to co-operate closely and a closer institutional linkage (e.g. by way of a Memorandum of Understanding) might be considered, e.g. so as to ensure that CDM eligibility criteria are applied in relevant cases under the Multilateral Fund.\textsuperscript{36} Employing the CDM for making the transition to non-halocarbon technology in

\textsuperscript{34} A possibility stressed by the GEF representative at recent meetings (mimeo); see also the forthcoming meeting report on the IPCC/TEAP Joint Expert Meeting in May 1999.

\textsuperscript{35} On the CDM, see in more detail Oberthür/Ott 1999, Chapter 14.

\textsuperscript{36} Pending a decision on the exact design of the CDM, the relevant bodies encompass in particular: the conferences of parties of both treaties, the Executive Board of the CDM, the
developing countries might also alleviate potential conflict over trade restrictions that industrialised countries might wish to introduce on certain products containing HFCs.

5.2 Paths to Enhancing Synergy and Learning

In addition to alleviating potential conflict, the Kyoto and Montreal Protocols might be linked more closely in order to exploit the potential for synergy and learning (see section 4 above). As regards customs codes and co-operation with the WCO, the Ozone Secretariat and Parties to the Montreal Protocol have diverse experiences that can inform related efforts under the Kyoto Protocol. Furthermore, particular mechanisms for dealing with this complicated issue have been developed under the Montreal Protocol. Following a decision of the Meeting of the Parties in 1998, the Ozone Secretariat established a discussion group on ODS customs codes involving selected experts on the internet in early 1999 that aims at advising the Secretariat on upcoming issues.

Rather than copying these efforts, the Kyoto Protocol might make use of the experience under the Montreal Protocol. Overall consistency of the customs codes system and its relation to environmental agreements might even benefit from direct co-operation between the two Protocols. Thus, the mandate and the number of participants in the ODS discussion group could be expanded so as to also fully cover the fluorinated GHGs. In the end, this and a subsequent intensive co-operation between the relevant bodies of the two Protocols might open up the opportunity to define an integrated approach to the issue and the WCO. This may especially be commanded in light of the overlap of the areas of application of ODS and their HFC substitutes, as otherwise WCO might be confronted with incompatible requests from both treaties. Besides, potential for involving more environmental agreements in such an integrated approach towards WCO exists, as a number of other treaties (e.g. the Basel Convention and CITES) are trade related and also have to deal with the WCO system.

The same may be true for different capacity building efforts undertaken under various treaties. To the extent that these cover similar areas, like data collection and reporting (see section 4 above), there is potential for reaping benefits from co-operation and co-ordination in terms of efficiency and effectiveness. Specifically related to the Montreal and Kyoto Protocols, experience with recovery and recycling schemes for ODS under the former might be built upon in establishing effective schemes for recovery and recycling of HFCs under the latter.

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FCCC Secretariat, the Multilateral Fund Secretariat, the Executive Committee of the Fund, and the subsidiary bodies of the climate regime.

37 Decision X/18 in UNEP/OzL.Pro.10/9.
38 UNEP/OzL.Pro/WG.1/19/2, VIII.
39 Most experts involved in the discussion group are involved in both processes already.
40 The result of a closer investigation of the issue could, however, also reveal that the Harmonised System can not be relied on for the purposes of the Kyoto Protocol and that another methodology might be needed in this case. Nevertheless, co-operation of the two treaties on that matter might be useful for clarifying the matter.
There is thus ample room for exploring opportunities for creating synergy between the Kyoto and Montreal Protocols (as well as other environmental treaties). To exploit the potential more fully, existing institutional arrangements can be further developed. For example, the Environmental Management Group recommended by the UN Task Force on Environment and Human Settlements,\(^{41}\) may provide the opportunity to identify such potentials timely. Consisting of entities within and outside the UN system concerned with environment and human settlements including participation from the major environmental conventions, the group may contribute to initiating appropriate action/co-operation. Regular meetings of the major Convention secretariats convened by UNEP have a similar potential.

However, the bodies co-operating in these fora are not necessarily in a position to exploit all the relevant potentials. For example, the FCCC and Ozone Secretariats may not be the most appropriate actors to initiate and support a learning process related to policies and measures for effective control of HFC emissions drawing on the ODS experience. The Ozone Secretariat has limited knowledge on this aspect, since national legislation and implementation is not usually reported to it.

Eventually, effective co-operation might thus benefit from assigning the task of furthering synergy and learning to a specific institution that monitors developments in various issue areas and conventions, identifies potentials for conflicts and synergies and draws the attention of relevant actors to such potentials timely. Thus, this institution would have a watch-dog and informational function. To a large extent, supporting co-ordination and catalysing various efforts is already part of UNEP's mandate. Strengthening and focusing the related efforts might well be one of the prime areas of UNEP's future activities and a rewarding field for strengthening UNEP's role.\(^{42}\)

References


\(^{41}\) UN Task Force 1998.

\(^{42}\) The restructuring of UNEP in 1998 including the linking of the various units concerned with global conventions can be seen as first steps in this direction.


Pinto, Frank; Si-Ahmed, S.M. and Steve Gorman 1999: Options for Reduction of Emissions of HFCs in Developing Countries, paper presented at the Joint IPCC/TEAP Expert Meeting on Options for the Limitation of Emissions HFCs and PFCs, Petten, the Netherlands, 26-28 May 1999.


