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RELATIONSHIP BETWEEN EFFORTS TO PROTECT THE STRATOSPHERIC OZONE LAYER AND EFFORTS TO SAFEGUARD THE GLOBAL CLIMATE SYSTEM: ISSUES RELATING TO HYDROFLUOROCARBONS AND PERFLUOROCARBONS

Submissions from Parties

1. The Conference of the Parties (COP), at its fifth session, adopted decision 17/CP.5 entitled "Relationship between efforts to protect the stratospheric ozone layer and efforts to safeguard the global climate system" (FCCC/CP/1999/6/Add.1).

2. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its fifteenth session, noted the information contained in document FCCC/SBSTA/1999/MISC.6 and Add.1 and 2 and also on the UNFCCC web site,[1] and encouraged Parties included in Annex I to the Convention, the relevant bodies of the Montreal Protocol, the Intergovernmental Panel on Climate Change (IPCC), intergovernmental organizations and non-governmental organizations to update further the information on available and potential ways and means of limiting emissions of hydrofluorocarbons and perfluorocarbons, including their use as replacements for ozone-depleting substances (FCCC/SBSTA/2001/8).

3. The SBSTA also invited Parties to provide their views, by 1 March 2002, on information aspects noted in decision 17/CP.5, for compilation into a miscellaneous document.

4. The secretariat has received five submissions from Parties and twelve from non-governmental organizations. Submissions from Parties are included in this document. In accordance with the procedure for miscellaneous documents, these submissions are attached and are reproduced in the language in which they were received and without formal editing. The submissions from non-governmental organizations are available on the web site of the UNFCCC secretariat (http://www.unfccc.int/program/wam/index.html). A limited number of CD-ROMs containing all submissions will be available for Parties at the sixteenth session of the SBSTA upon request.

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[1] http://www.unfccc.int/program/wam/index.html.

[*] These submissions have been electronically imported in order to make them available on electronic systems, including the World Wide Web. The secretariat has made every effort to ensure the correct reproduction of the texts as submitted.

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PAPER NO. 1: AUSTRALIA

Relationship between efforts to protect the stratospheric ozone layer and efforts to safeguard the global climate system: issues relating to hydrofluorocarbons and perfluorocarbons

The 15th session of the Subsidiary body for Scientific and Technological Advice invited Parties to submit their views on information aspects noted in decision 17/CP.5 on available and potential ways and means of limiting emissions of hydrofluorocarbons and perfluorocarbons.

[Ref: Document FCCC/SBSTA/2001/L.16, paragraph 3]

Introduction

Recognition of the inter-linkages between stratospheric ozone protection and global climate change, both in terms of the science and policy development, is well established. In this context, Australia supports the general principle that action taken to reduce hydrofluorocarbon (HFC) and perfluorocarbon (PFC) emissions should not undermine the efforts to phase-out ozone depleting substances (ODSs). At the same time, moving from ODSs to replacement gases requires taking account of the need to manage the transition for the best greenhouse outcome.

Both the *Montreal Protocol on Substances that Deplete the Ozone Layer* Technology and Assessment Panel (TEAP) and the Intergovernmental Panel on Climate Change (IPCC) have set out in detail the important scientific, institutional and policy links that exist between these environmental issues. This was stressed most recently in the special appendix on the subject in the IPCC's Third Assessment Report (TAR).

A key message from these reports is that the ongoing phase-out of ODSs and the management of HFC and PFC emissions require coordinated policy responses by governments to foster coordinated action by industry. Australia supports an integrated and streamlined approach to ozone protection and climate change policy development as it is an important means of enabling the comprehensive and effective action required to limit emissions.

Possible areas of international coordination

Australia has identified two particular areas where Parties could work more closely together to assist the development of national policies to limit emissions of HFCs and PFCs. (Details of Australia's domestic response to limiting HFC and PFC emissions are set out in Attachment A.)

1. Development of global "toolbox" of technical and policy information to assist policy development

Given the gaps in current knowledge, it would be useful for Parties to consider the development of appropriate mechanisms for sharing and exchanging relevant information between national policy-makers on ways and means of limiting HFC and PFC emissions.

Australia supports the development of a global "toolbox" of technical and policy information that could be readily accessed by national policy-makers to provide useful guidance and feedback on appropriate mitigation responses. A global "toolbox" could include the following:

- *Emissions data and reporting methodologies*

  Robust emissions data is a key component of effective policy formulation. Given the diffuse nature of sources of HFC and PFC emissions, policy-makers will need to work towards improving the certainty of emissions data and estimates. In particular, this will involve improving reporting methodologies. Experience and methods are evolving as Parties gain experience and improve their knowledge. A network of the evolving inventory data and methodologies used by Parties would be a useful tool to allow Parties to share and compare national approaches and learn about how particular inventory problems have been solved. Such information would be an important means of improving national and global estimates of HFC and PFC emission

- *Policy information on mitigation options, economic aspects and technological developments*

  The IPCC notes in the TAR that a lack of technical data and full access to information on mitigation options can act as a barrier to creating policy certainty in minimising emissions of HFCs and PFCs. Filling the gaps in current knowledge can also capture new mitigation options and the latest technological developments. Key areas identified for further analysis include identification and assessment of HFC and PFC mitigation policies and methodologies for assessing costs of these mitigation technologies and measures, with a particular emphasis on country- or region-specific analysis. In developing effective national policy responses, it is important that Parties are able to develop policies that reflect, and are suited to, their national circumstances.

  Through a network of policy information on national mitigation options, economic aspects and technological developments for HFC and PFC use, Parties would be able to share and exchange relevant information to guide policy responses that best fit their national circumstances and the particular circumstances of their Montreal Protocol industries.

Australia recommends that Parties consider current institutional mechanisms for coordinating compilation of, and access to, national emissions data and reporting methodologies, and policy information on national mitigation options, economic aspects and technological developments for HFC and PFC use (such as a global "toolbox" of technical and policy information).

2. <u>Increased coordination of ozone protection and climate change technology transfer and capacity building to developing countries</u>

The inter-linkages between ozone protection and global climate change are particularly important in developing countries where fundamental choices regarding the means and timing of phase out of ODSs are still being made. Initial steps to link climate change to ozone protection decision-making by developing countries have been taken in cross-focal work being carried out by the IPCC, TEAP and UNEP's OzonAction Programme, as well as some initial coordination of financing by the Montreal Protocol Multilateral Fund (MLF) and the Global Environment Facility (GEF).

The development of transition strategies from ODSs that simultaneously minimise emissions of HFCs and PFCs can deliver 'win-win' outcomes for developing countries. These strategies will need to cover a wide range of policy approaches to suit national circumstances. This will include not only investment in alternative substances and technologies, but also development of policies aimed at containment of HFCs and PFCs through effective life cycle management such as equipment design and installation, technician training and end-of-life recovery and destruction. A key aspect in managing overall

reductions in HFC and PFC emissions will be adherence to the concept of Life Cycle Climate Performance to ensure that transitions from ODSs result in the best greenhouse outcome.

The success to which developing countries can optimally transition out of ODSs and minimise HFC and PFC emissions will depend not only on improved information networks regarding technical and policy information. It will also require increased coordination and integration of technology transfer and capacity building functions under the Montreal Protocol and the international climate change regime.

Australia recommends that Parties consider appropriate ways of strengthening institutional links between ozone protection and climate change activities, including increased coordination of MLF and GEF funding for developing countries for technology transfer and capacity building and other mechanisms such as the Clean Development Mechanism. Parties could consider giving guidance through the respective executive bodies to the MLF and GEF on providing enhanced coordination of activities that provide mutual benefits.

Enhancing coordination between Secretariats

In progressing these and other aspects on means of limiting HFC and PFC emissions within the context of the relationship between ozone protection and climate change, Australia recommends that Parties give guidance to the Secretariats of the Montreal Protocol and the UNFCCC on ways of enhancing their level of coordination in pursuing such objectives.

Attachment A

AUSTRALIA'S STRATEGIES FOR MANAGING SYNTHETIC GREENHOUSE GAS EMISSIONS

Given their global warming potency and the fact that their emissions are projected to increase significantly from their current low level, the timing of Australia's management strategies for synthetic greenhouse gases is opportune for cost-effective and efficient abatement. The Australian Government is developing its synthetic gas management strategies within the context of the National Greenhouse Strategy (NGS) – the strategic framework of policies and measures for advancing Australia's domestic greenhouse action across all sectors of the economy. The NGS includes a measure requiring Government to work with industry to develop environmental management strategies for synthetic gases. Australia's strategies include both overarching policy principles and tailored industry responses, with a clear focus on building co-operative partnerships between government and industry.

Overarching policy principles

To guide the further development and implementation of synthetic greenhouse gas policy, and to provide industry and other stakeholders with policy certainty, the Australian Government has developed a set of overarching principles for the management of synthetic greenhouse gas emissions. These include:

- *Responsible use* – ensuring that synthetic gases are used only where the activity is necessary and where they are needed to cost-effectively meet specific requirements for technical feasibility and reliability, health and safety, or reducing overall greenhouse gas emissions.
- *Emissions minimisation* – ensuring that where synthetic gases are used, all practicable steps are taken to reduce emissions through best practice life cycle management – this includes appropriate equipment design and selection; training and certification of suppliers and users in the appropriate

handling, installation, maintenance and operation of equipment using synthetic gases; as well as recovery, recycling and or destruction of synthetic gases at the end of their life.

- *Effective monitoring and reporting* – ensuring that information and data on synthetic gas use and emissions is provided by industry to enable ongoing review and monitoring for policy development, inventory compilation and projections analysis and improve environmental understanding.

Specific industry action - Montreal Protocol industries

In putting these principles into practice, the Australian Government recognises the need to tailor its management strategies to the particular circumstances of the various industries that use and emit synthetic greenhouse gases – a "one size fits all" policy approach will not lead to equitable and cost-effective greenhouse outcomes for these diverse industries. By developing new partnerships between government and industry, or building on existing ones, the Government is seeking to deliver flexible, cost-effective abatement action.

Managing the phase-out of ozone depleting substances under the Montreal Protocol has implications for the management of synthetic greenhouse gases. As HFCs are increasingly used as alternatives to CFCs and HCFCs in the Montreal Protocol industries – refrigeration and air conditioning, fire prevention, foam blowing, solvents, aerosols and solvents – it is appropriate to promote best practice in the management of the synthetic greenhouse gases used in these industries. Approaches to managing synthetic greenhouse gas emissions in Montreal Protocol industries include:

- *Containment of emissions through life cycle management*

  In order to enhance Australia's ability to address the significant and on-going environmental threat of stratospheric ozone depletion, while at the same time better managing the increasingreliance on synthetic greenhouse gases, the Australian Government is currently developing a comprehensive regulatory framework to manage emissions of both synthetic greenhouse gases and ozone depleting substances. The proposed framework, consistent with the overarching principles outlined above, includes the following specific elements:

  - *General requirements to avoid and minimise emissions* aimed at minimising emissions as a result of their supply, handling and use – this will include obligations on suppliers and reclaimers to accept recovered synthetic gases for recycling or destruction, as well as obligations on importers and (future) manufacturers to put mechanisms in place to ensure recovery, recycling and destruction of used gas at the end of its life;
  - *Establishment of a national registration and certification program* for suppliers, purchasers and end-users to ensure adequate environmental and technical training in the appropriate handling and use of synthetic gases and ozone depleting substances.

  A key transition for the refrigeration and air conditioning industry is the establishment of a national training, certification and recovery program aimed at minimising emissions of HFCs to be partly funded under the Australian Government's Greenhouse Gas Abatement Program. In addition to industry co-investment, $3.56 million will be given to the National Refrigeration and Air Conditioning Council and Refrigerant Reclaim Australia for the national program to abate approximately 3.5 Mt CO_2-e between 2008 and 2012.

- *Improved emissions data and reporting*

  Improved emissions data is an important step in Australia's synthetic greenhouse gas policy development. This is being achieved in a variety of ways:

  - The proposed end-use controls will include record keeping and reporting requirements to assist in monitoring consumption and emissions trends of synthetic gases and ozone depleting substances. The Greenhouse Gas Abatement Program funding given to the refrigeration and air-conditioning industry also includes reporting requirements;
  - A study (commissioned by the Australian Greenhouse Office and Environment Australia) has just been completed that compiles data on current use and future trends in supply and emissions of ozone depleting substances and synthetic greenhouse gases used by Montreal Protocol industries in Australia.
  - Australia has reached agreement with domestic industry to report data on synthetic greeenhouse gases annually to enable calculation of emissions using an IPCC Tier 2 approach and for inclusion in the National Greenhouse Gas Inventory and to provide for the calculation of projections of HFCs and PFCs.

- *Support for research into better practices, alternative substances and not-in-kind technologies*

  Under the proposed end-use controls, funding will be made available for research and investigation into the assessment and adoption of better management practices, alternative substances and non-in-kind alternatives to synthetic gases. The Australian Greenhouse Office has also recently commissioned a study into the commercial availability, technical applicability and cost efficiency of alternative substances and technologies. This research is intended to fill the gap in current knowledge on cost estimates for the use of alternative substances and technologies, with a view to supporting policy development for their commercial uptake, where practicable.

Additional information

Additional information on Australia's strategies for managing synthetic greenhouse gas emissions can be obtained by emailing ngs@greenhouse.gov.au. Relevant publications can be downloaded from the Australian Greenhouse Office's website at http://www.greenhouse.gov.au/pubs/index.html.

PAPER NO. 2: COLOMBIA

COMENTARIOS SOBRE LA RELACIÓN ENTRE LOS ESFUERZOS INTERNACIONALES DE PROTECCIÓN DE LA CAPA DE OZONO Y LOS ESFUERZOS POR ESTABILIZAR EL SISTEMA CLIMÁTICO MUNDIAL

Después de los primeros documentos y discusiones al respecto, ha quedado clara la necesidad de una armonización entre los Protocolos de Montreal Relativo a las Sustancias que Agotan la Capa de Ozono y de Kioto de la Convención Marco sobre Cambio Climático.

Desde el punto de vista de los países que operan al amparo del parágrafo 1 del artículo 5 del Protocolo de Montreal (países en desarrollo), resulta preocupante el hecho de que gran parte de los proyectos de reconversión industrial en los sectores de refrigeración doméstica y comercial se han basado en HFCs (Hidrofluorocarbonos) para el sistema de enfriamiento, siendo ésta una sustancia definitiva en el Protocolo de Montreal (sin potencial de agotamiento del ozono) pero un gas efecto invernadero del Protocolo de Kioto – con alto potencial de calentamiento global.

Es necesario tener en cuenta que las economías de los países en desarrollo son altamente vulnerables a medidas restrictivas en el comercio internacional o giros "inesperados" en la disponibilidad de productos o materias primas. En el caso concreto de los HFCs, los programas de inversión y producción de grandes y medianas empresas no están considerando cambios tecnológicos en el mediano plazo.

Por otra parte, se debe recordar que el sector de servicios continúa capacitándose en el uso y manipulación de esta sustancia, lo que ha implicado altos costos en el caso del servicio prestado por los productores de los equipos. Así mismo, los talleres y centros de mantenimiento independientes establecieron su actividad en torno a los HCFs.

Por las anteriores consideraciones deberían acordarse reuniones entre los órganos técnicos de ambos protocolos donde se examinen asuntos tales como:

- Programas de formación continua en mejores prácticas en servicio y mantenimiento de equipos que contengan HFCs.

- Búsqueda de tecnologías o procedimientos tecnológicos que reduzcan al máximo las emisiones de HFCs y propendan por la eficiencia energética.

- Realizar proyecciones de mediano y largo plazo sobre las necesidades de suministro de HFCs para los países en desarrollo y buscar que las medidas de control del Protocolo de Kioto para la reducción de esta sustancia sean consecuentes con esas necesidades.

Finalmente, en el caso de Colombia no se ha determinado algún uso importante de los perfluorocarbonos.

PAPER NO. 3: SPAIN

SUBMISSION BY SPAIN ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES, AND BULGARIA, CROATIA, CYPRUS, CZECH REPUBLIC, ESTONIA, LATVIA, LITHUANIA, POLAND, ROMANIA, SLOVAKIA, SLOVENIA

BRUSSELS, 18 FEBRUARY 2002

RELATIONSHIP BETWEEN EFFORTS TO PROTECT THE STRATOSPHERIC OZONE LAYER AND EFFORTS TO SAFEGUARD THE GLOBAL CLIMATE SYSTEM: ISSUES RELATING TO HFCS AND PFCS. INFORMATION ASPECTS NOTED IN DECISION 17/CP.5

Spain, on behalf of the European Community and its Member States, and Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia welcome the opportunity to submit their views on the information aspects noted in Decision 17/CP.5, as requested by SBSTA at its 15th session.

Introduction

At the 8th session of SBSTA, the Executive Director of the United Nations Environment Program underscored the need for close cooperation between institutions in the United Nations family and for a better scientific assessment of the linkages between Conventions and of possible synergies in their programmes, for example, with respect to the cross-cutting environmental demands posed by hydrofluorocarbon gases. At the 9th session of SBSTA, the issue of available technologies to limit and reduce emissions of HFCs and PFCs and the relationship between the Kyoto Protocol and the Montreal Protocol on Substances that Deplete the Ozone Layer was also raised.

At its 4th session, the Conference of the Parties took note of the SBSTA work on this issue and adopted Decision 13/CP.4 entitled "Relationship between efforts to protect the stratospheric ozone layer and efforts to safeguard the global climate system: issues related to hydrofluorocarbons and perfluorocarbons". This decision invited Parties, international organizations and private institutions to provide information on available and potential ways and means of limiting emissions of HFCs and PFCs, and requests the Secretariat to compile such information. The decision also encouraged the convening of a workshop by the IPCC and the Technology and Economic Assessment Panel of the Montreal Protocol to assist the SBSTA in this issue.

At its 5th session, the Conference of the Parties took note of the report on the joint IPCC/TEAP meeting, held in Petten (the Netherlands) from 26 to 28 May 1999, and noted with appreciation the information provided under Decision 13/CP.4, that was available at the UNFCCC web site. The COP, on the recommendation of the SBSTA, adopted decision 17/CP.5 entitled "Relationship between efforts to protect the stratospheric ozone layer and efforts to safeguard the global climate system", that invited Parties to give consideration to the information on available and potential ways and means of limiting emissions of HFCs and PFCs, and requested the SBSTA to give further consideration to information aspects of this issue.

At the 15th session of the SBSTA, the EU recalled the need to implement decision 17/CP.5 and suggested that the "relationship between efforts to protect the stratospheric ozone layer and efforts to safeguard the global climate system" would become a substantive agenda item at the next SBSTA session.

Latest findings and EU views on this issue

Ozone depletion and global climate change are linked through physical and chemical processes in the atmosphere. CFCs, HCFCs and halons are ozone depleting substances, as well as anthropogenic greenhouse gases, and are controlled under the 1987 Montreal Protocol and its Adjustment and Amendments. While CFCs are largely banned in developed countries since 1996, HCFCs consumption is being subjected to a gradual phase-out until 2020 (2040 for developing countries). HFCs have no ozone depleting potential but produced and often promoted as replacements for CFCs and HCFCs. However, the fluorinated gases covered by the Kyoto Protocol (HFCs, PFCs and SF_6) are potent greenhouse gases with high global warming potentials. These are increasingly being used in many applications and emitted from a wide range of sources in markets with very different characteristics.

The IPCC states that "the abundances of the HCFCs and HFCs are increasing as a result of continuation of earlier uses and of their use as substitutes for the CFCs … Because current concentrations are relatively low, the present contribution of HFCs to radiative forcing is relatively small". Although future emissions of HFCs, in particular, strongly depend on the technologies involved in their production and use, all emission scenarios recently developed by IPCC predict that global emissions and atmospheric concentrations of most of the fluorinated gases will grow substantially in coming decades, increasing their contribution to radiative forcing and global warming. The IPCC also recognises that this assumption carries a substantial uncertainty.

The EU and other Parties mentioned above see that this likely future growth of fluorinated gas emissions, in particular HFCs, is a cause for concern and considers that additional policies and measures, such as regulatory instruments and voluntary agreements, are needed to avoid uncontrolled growth of emissions. Many studies clearly establish that there is a significant potential for the reduction of emissions of fluorinated gases from business as usual scenarios in most market segments. Consequently, the EU, as announced in the European Climate Change Programme, has begun to develop a Framework Directive on Fluorinated gases. This is expected to include containment of emissions from stationary and mobile sources, monitoring of quantities of fluorinated gases being placed on the market as well as marketing and use restrictions, where appropriate, for relevant applications where viable alternatives are available and if improvement of containment is not feasible. The directive would also take into account existing voluntary initiatives by some fluorinated gases industry sectors, where the development of alternatives is still ongoing.

Further examination of available options to reduce the emissions of fluorinated gases (alternative substances and technologies, containment, improved system or process design, and end of product life recovery for recycling or destruction) are required, avoiding developments which would make it more difficult for Parties in future to comply with the emission reduction targets.

Stratospheric ozone and climate protection efforts are also financially linked. Further more coordinated investment would often be highly cost-effective and could encourage conversion to alternatives to ozone depleting substances that demonstrate better Life Cycle Climate Performance, safeguarding both the ozone layer and the climate system. We believe that a careful assessment is needed of more explicit coordinated actions that might be taken by Parties to address the environmental problems of stratospheric ozone depletion and climate change, in pursuing the achievement of the Annex I Parties commitments under the Kyoto Protocol and developed and developing countries commitments under the Montreal Protocol.

Actions to be taken

Increasing the awareness with respect to climate change issues is required to lead to changes in behaviour and to support solutions responding to climate change. The exchange of knowledge and experiences would be beneficial for Parties in support of actions to reduce the emissions of fluorinated gases and in the achievement of their commitments under the Kyoto Protocol.

Therefore, the EU and other Parties mentioned above identify as priorities the following actions to be taken in implementing decision 17/CP.5:

1. Identify and update information on available and potential ways and means of limiting emissions of fluorinated gases, taking account of, inter alia, health, medical, environmental and safety considerations, energy and resource efficiency and associated emissions in carbon dioxide equivalent, and technical and economic considerations. This should be done by requesting IPCC, in close cooperation with TEAP, to:
   (a) carry out integrated and independent assessments of relevant technologies in order to facilitate a comparison between the feasibility and environmental impact of using fluorinated gases and alternatives,
   (b) develop an user guide or handbook on "best practices" for minimizing emissions of fluorinated gases, covering both technologies and system design, including the following:
      (i) improvement of containment technologies during the life cycle of equipment (manufacturing, use and decommissioning),
      (ii) use of alternative fluids with zero/low GWP,
      (iii) use of not-in-kind (NIK) technologies,
      (iv) process modifications to avoid or reduce by-product formation or emission.

2. Update information under both Protocols on the relationship between efforts to protect the stratospheric ozone layer and efforts to safeguard the global climate system by:
   (a) Requesting Parties and international organizations to report on:
      (i) regulations and other measures in place and/or under consideration,
      (ii) coverage and accuracy of emissions' monitoring and verification;
   (b) Compiling relevant information from third National Communications.

3. Promotion of coordinated actions to address the environmental problems of stratospheric ozone depletion and climate change:
   (a) examine the feasibility of establishing international voluntary and/or negotiated agreements with selected sectors and industries;
   (b) request UNEP to consider how to improve the coordination of specialized financial institutions, such as the Global Environment Facility and the Multilateral Fund, with the view to improve the provided assistance under the Montreal Protocol and the Kyoto Protocol.
   (c) request the UNFCCC COP and the MP MOP to consider the possibility of jointly financing projects from the Multilateral Fund and the Clean Development Mechanism, enabling developing countries that wish to do so to replace ODS technologies by low or non GHG-emitting technologies in one step.

4. Raise awareness amongst Parties and stakeholders by convening meetings and side events at sessions of the Subsidiary Bodies, other relevant intergovernmental and international conferences, if possible in collaboration with relevant NGOs, using the re-sources of the UNFCCC Secretariat, the Montreal Protocol's Ozone Secretariat if appropriate, and/or interested Parties under the guidance of the Convention bodies and its Chairpersons.

These actions should be complemented by the UNFCCC Secretariat with regular reports on progress made.

The EU and other Parties mentioned above believe that Annex I Parties and interested international organizations, and non-Annex I Parties in a position to do so, should provide the necessary financial and/or technical support for selected activities identified above. Such support could also be in the form of hosting workshops, side events, databases and other web-based tools, and by funding the publication, translation and/or free distribution of relevant documents and reports.

Timing

The EU and other Parties mentioned above propose that the SBSTA, at its 16th session, should therefore consider this issue in order to elaborate a concrete proposal on the actions to be taken and report to the Conference of the Parties at its 8th session.

PAPER NO. 4: SWITZERLAND

Relationship between efforts to protect the stratospheric ozone layer and efforts to safeguard the global climate system

In response to the call at the fifteenth session of the SBSTA to further update the information on available and potential ways and means of limiting emissions of hydrofluorocarbons and perfluorocarbons, including their use as replacements for ozone depleting substances, Switzerland presents the following information.

1. Switzerland is revising its national regulations concerning ozone depleting substances and other substances with a high GWP and a long half-life in the air in a single mandatory regulatory framework. Amongst other gases, HFC, PFC and SF6 will be subject to the new rules under this regulatory framework.

2. In revising the regulatory framework, Switzerland has been guided by the following principles:

* To restrict the use of substances with a long half-life in the air to applications for which other products or techniques are not available or have a more detrimental impact on the environment;
* To restrict as far as possible the emissions resulting from authorised uses;
* To take into account legally binding voluntary agreements adopted by an industrial sector.

3. In Switzerland, the current goal is to stabilise the emissions of such substances at the lowest feasible level.

4. The regulatory framework focuses on the following sectors: RAC, plastic foams, solvents, spray cans, fire extinguishers, high voltage equipment and industrial processes and products.

5. To import these substances, a license has to be obtained from the Swiss Agency for the Environment, Forests and Landscape (SAEFL). The RAC sector will be addressed in both ways, by limitation of uses as well as emissions reduction. The foams, spray cans and fire extinguishers sectors will be addressed mainly through limitation of uses, and the solvent and high voltage sectors through emission reduction measures.

6. More information on the Swiss policy on these matters as well as details of the regulations in German, French and Italian can be obtained from the SAEFL at the following address : http://www.environnement-suisse.ch/buwal/fr/news/artikel/20011220/00659/index.html

PAPER NO. 4: UNITED STATES OF AMERICA

U.S. SUBMISSION
ISSUES RELATING TO HFCs, PFCs, AND SF_6

INTRODUCTION

The U.S. was one of the first nations to develop and implement a national strategy to control non-carbon dioxide (CO_2) gases, including the high global warming potential (GWP) gases. Since our 1999 submission under decision 17/CP.5, the United States has continued to implement aggressively policies and measures to reduce emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). The U.S. recognizes the nexus of ozone depletion and climate change and these efforts are intended to facilitate a smooth transition out of ozone depleting substances without creating new environmental issues. Our domestic programs emphasize emissions and overall climate impact rather than specific chemical use.

The United States continues to use a mix of regulatory and voluntary measures to promote responsible use including recovery and recycling, identification of alternative substances and technologies, avoiding technically unnecessary use, and catalyzing innovation and adoption of new, low- or no-emitting technologies. We have also worked to advance high-energy efficiency standards and the use of Life Cycle Climate Performance (LCCP) to ensure that opportunities for overall climate protection are not lost. In some applications, HFCs are the preferred alternative to ozone depleting substances, where they provide superior overall technical and environmental performance and safety.

Highlights of further ways and means of limiting HFC, PFC and SF_6 emissions implemented by the United States include: aggressive enforcement of no venting and recycling regulations; promotion of responsible use and avoidance of unnecessary high GWP use, broadened emission reduction programs with industry and the military through voluntary partnerships, and global collaboration for information sharing with international industry and military organizations.

The 1999 U.S. submission provides detail on programs launched in the 1990s to reduce high GWP emissions. The following updates U.S. progress and outlines new programs that limit emissions of high GWP gases.

REGULATORY ACTIONS

In the United States recovery of ozone depleting substance (ODS) refrigerants as well as their HFC and PFC substitutes is required. It is illegal knowingly to vent any refrigerant into the atmosphere during the maintenance, service, repair, or disposal of refrigeration and air-conditioning equipment. The United States enforces the no venting laws through the U.S. Environmental Protection Agency (EPA). Aggressive enforcement is a hallmark of the U.S. recovery, recycling and no venting programs for refrigerants. For example, EPA can impose financial fines on violators of up to US$27,500 per day per violation. During 1999 and 2000, EPA issued financial penalties as high as US$3.5 million to violators of the non-venting prohibitions.

The Significant New Alternatives Policy (SNAP) program continues to establish acceptable and unacceptable use conditions for climate friendly alternatives particularly in the insulation foam, solvent, and refrigeration sectors. Under the SNAP program, U.S. EPA places limits on use of ODSs when the Agency determines that other existing alternatives “reduce overall risk to human health and the environment”. The review process takes into account health, medical, environmental and safety

considerations, energy efficiency and associated emissions of CO_2, and technical and economic considerations. By limiting use of global warming gases in specific applications where safe alternatives are available, this program facilitates the implementation of the Montreal Protocol and helps avoid unnecessary use of HFCs, PFCs and SF_6. A prime example of the EPA's success at limiting new greenhouse gas emissions is the Agency's 1999 decision to ban self-chilling can technologies using HFC-134a and HFC-152a. It was determined that even a small market penetration of these cans could substantially increase U.S. emissions of greenhouse gases. The Agency's analysis showed that a 5% market penetration of an HFC-134a self-chilling can resulted in greenhouse gas emissions of 96 million metric tons of carbon equivalent (MMTCE). At 25% market penetration, emissions would be nearly 479 MMTCE. Because the analysis demonstrated that unacceptably high greenhouse gas emissions would result from the direct release of the cans' refrigerants to the atmosphere, EPA listed the use of HFC-134a and HFC-152a as refrigerants in self-chilling cans as unacceptable.

VOLUNTARY PARTNERSHIPS

The 1999 U.S. submission outlined voluntary programs to reduce high GWP emissions in the aluminum, magnesium, semiconductor, HCFC-22 production and electric power transmission and distribution sectors. These programs continue, having reduced emissions by 8 MMTCE in 2000 and are expected to achieve reductions greater than 35 MMTCE in 2010 as compared to business as usual without these programs. In addition to specific program activities directed toward emission reductions and technology evaluation, these partnerships have made major contributions toward GHG inventory and data quality methods. Experience gained through these partnerships and expertise provided by industry participants enabled the development of IPCC Good Practice Methods for many high GWP sectors that previously lacked standardized emission inventory methods.

Sector-specific accomplishments since 1999 include the following:

Aluminum Since the partnership was formed in 1996, it has had great success in characterizing emissions from smelter operations and reducing overall emissions. The partners met their 2000 emission reduction goal of reducing emissions by over 45% from 1990 levels. A study to enable companies to quantify the cost of an anode effect is being undertaken to help companies analyze current emissions and develop better emission reduction strategies.

HFC-23 Emission Reduction Program The partners have reduced emissions of HFC-23 through process optimization and thermal destruction. Despite an estimated 35% increase in production since 1990, total emissions in 2000 were below 1990 levels – a reduction of 4.8 MMTCE compared to business-as-usual.

SF_6 Emission Reduction Partnership for the Magnesium Industry U.S. EPA's Partners have developed practical emissions inventory methods, tested an SF_6 capture/recycle device, and implemented successful emission reduction strategies. U.S. EPA is also collaborating with the International Magnesium Association (IMA) to identify and evaluate protective cover gas alternatives to SF_6 and SO_2. The study is expected to be complete by the end of 2002.

SF_6 Emission Reduction Partnership for Electric Power Systems: Through its voluntary SF_6 partnership, the US has been instrumental in generating better data on worldwide production and sales of SF_6. This information is being used by both scientists and policymakers better to understand the flow of SF_6 through the economy and environment. In 2000, U.S. EPA and the Australian Greenhouse Office sponsored an international conference titled, "SF_6 and the Environment: Emission Reduction Strategies". This conference brought together 185 attendees from 11 countries, representing the electric

power, magnesium industries and national governments. The conference provided an excellent forum for industry leaders to share expertise on the latest policy, technological and scientific advances regarding SF_6 emission reductions. Conference proceedings can be found at: http://www.epa.gov/highgwp1/SF6/proceedings.html

PFC Emission Reduction Partnership for Semiconductor Industry: U.S. EPA estimates U.S. semiconductor voluntary efforts will reduce PFC emissions in 2010 by 14 MMTCE compared to a scenario of no voluntary action. Launched in 1996, the "U.S. EPA PFC Emission Reduction Partnership for the Semiconductor Industry" has catalyzed global action by semiconductor manufacturers to reduce emissions of PFCs. Members of the World Semiconductor Council (WSC) produce over 90 percent of the world's semiconductors and have identified PFC emission reduction as the industry's top environmental priority. Despite an historical industry growth rate of over 14% per year, WSC member companies have committed to reduce emissions of PFCs by 10% below their 1995 baseline by 2010.

Several new voluntary programs have been launched since 1999 and are outlined below:

Mobile Air Conditioning

As part of the effort under the Montreal Protocol for the Protection of the Ozone Layer, new vehicles worldwide have been redesigned to use HFC-134a refrigerants in air conditioning systems rather than CFC-12. The production of CFC-12 refrigerants for use in developed countries was halted in 1996 and will be phased out globally by 2006. HFC-134a was the global choice because it has no ozone depleting potential, has six times less global warming potential than CFC-12, is non-flammable, has low toxicity, and has cooling capacity and energy efficiency that can be made comparable to CFC-12 through engineering.

The U.S. EPA, the Society of Automotive Engineers (SAE), and the Mobile Air Conditioning Society Worldwide (MACS) have organized a global voluntary partnership to promote improved air conditioning systems and service. The choice of measures to improve the environmental performance of vehicle air conditioning systems is complicated because 1) both refrigerant and fuel consumption must be considered over the life of the vehicle, 2) customers demand reliable and affordable equipment, and 3) new systems may require special safety systems and technician training.

The partnership includes government, academic, environmental, testing, and corporate partners. Members as of January 2002 are: SAE, U.S. EPA, MACS, Ecole des Mines de Paris, Environment Canada, Environment Directorate-General of the European Commission, International Organization for Standardization, Underwriters Laboratories, University of Braunschweig, University if Illinois, US Army, US National Renewable Energy Research Laboratory, World Resources Institute, Audi, Behr, Bergstrom, BMW, CalsonicKansei, DaimlerChrysler, Delphi Automotive Systems, Denso, Eaton, Freightliner, General Motors, Goodyear, Honda, Johnson Controls, Konvekta, Nissan, Neutronics, Parker-Hannifin, Sanden, Snap-On Diagnostics, Texas Instruments, Toyota, Uview Ultraviolet Systems, Valeo, Visteon Corporation, Volkswagen, and Volvo Car Corporation.

Partner consensus on the best methods of speeding progress toward the implementation of more energy-efficient mobile air conditioning systems is outlined in the partnership brochure available at: http://www.epa.gov/appdstar/information.html

Military

Climate protection and stratospheric ozone depletion are environmental security concerns. The U.S. Department of Defense (DoD) approach to climate protection is being modeled after its successful contribution to stratospheric ozone protection—including active collaboration, policy leadership, and technology forcing. U.S. EPA and the U.S. DoD are coordinating to identify military-specific uses of HFCs, PFCs and SF_6 and to identify opportunities to integrate ozone and climate change strategies.

In February 2001, one hundred and sixty military officers, environmental authorities and technical experts from 33 countries participated in a four-day workshop on the military role in protecting the stratospheric ozone layer and global climate. The workshop was jointly organized by the United Nations Environment Programme (UNEP), the U.S.EPA, and the U.S. DoD and supported by military and environmental organizations from Australia, Canada, Germany, the United Kingdom, the European Union, and the United States. It was agreed that military organizations can play an important role in reducing greenhouse gas emissions and stimulating technical innovation.

Investments in military energy efficiency improvements are often cost-effective and can actually enhance defense and warfare capability. Efficient aircraft, ships, and vehicles can be deployed more rapidly and require less logistical support. Equipment using less energy is harder to detect because there is lower heat, noise, and emission signatures.

Military organizations worldwide have sponsored technology demonstrations, first commercialization, and large-scale installations of photo-voltaic systems, solar turbines, solar homes and buildings, lighting and insulation upgrades, co-generation, district heating and cooling, and electric and hybrid vehicles. There can be significant markets for energy-efficient technology for the same applications as civilian sectors (buildings, vehicles, communications, offices, schools, etc.) and for military unique applications of solar, fuel cell and hybrid technology. Furthermore, the military is at the cutting edge for hydrodynamic and aerodynamic innovation.

Information and proceedings from the conference are available on the UNEP website: http://www.uneptie.org/ozonaction/events/military/home.html

Responsible Use of HFCs

Adherence to responsible use principles can lead to reductions in HFC emissions below current projections. U.S. EPA and an U.S. Industry Non-governmental Organization (INGO), The Alliance for Responsible Atmospheric Policy, are collaborating to implement a worldwide voluntary partnership for responsible use for HFC-producing and HFC-using industries. The program is scheduled to be launched in Spring 2002 and is expected to include both industry and government partners. In addition to sector-specific principles, partners will commit to Responsible Use Principles as follows:

- Select HFCs for applications where they provide health, safety, environmental advantages, or unique societal benefits
- Minimize HFC emissions to the lowest practical level during chemical manufacturing, and during use and disposal of equipment using cost-effective technology
- Design and operate HFC-producing plants with the goal of achieving zero HFC emissions
- Engineer, operate and maintain HFC-using systems to minimize emissions and maximize energy efficiency
- Recover, recycle, reclaim and/or destroy used HFCs where technically and economically feasible
- Promote comprehensive technician training in HFC handling to assure compliance with regulations and stewardship practices

- Meet all appropriate regulatory standards governing HFC equipment installation and maintenance, HFC transport and storage, and, where applicable, exceed such standards with voluntary initiatives
- Accurately report HFC production and promote models that accurately estimate emissions

Voluntary Code of Practice for HFC and PFC Fire Protection Agents

The overriding concern of the fire protection industry is the reduction of risk to people and property from the threat of fire through the use of products and systems proven to be effective. Nonetheless, the U.S. fire protection industry supports the goal of eliminating non-fire emissions of fire protection agents, and is committed to continuing to contribute both to ozone layer and climate change protection. HFCs and PFCs have been commercialized as replacements for ozone-depleting substances including halons. The development of these chemicals for use in fire and explosion suppression applications has been instrumental in achieving the accelerated halon production phase-out mandated by the Montreal Protocol. Currently, emissions of these agents from modern, properly maintained equipment is estimated at less than 2% per year of the installed bank. In collaboration with U.S. EPA, the Fire Equipment Manufacturers Association (FEMA), Fire Suppression System Association (FSSA), Halon Alternatives Research Corporation (HARC), and the National Association of Fire Equipment Distributors (NAFED) have developed an emission reduction strategy and set of measures intending to minimize HFC and PFC emissions. These measures address the development and implementation of relevant regulations and standards, discharge testing, technician training, decommissioning, servicing and disposal, record-keeping and reporting, and communication and outreach.

LIFE CYCLE CLIMATE ANALYSIS

For technologies that have direct greenhouse gas (GHG) emissions and indirect energy emissions such as refrigeration applications, the U.S. encourages use of Life-Cycle Climate Performance (LCCP) rather than solely focusing on the direct emissions. Life-Cycle Climate Performance considers emissions that occur during chemical manufacture, in chemical and product transportation, while charging equipment, and during recovery and disposal. And, very importantly, this calculation must include emissions from the generation of electricity and account for any additional energy that may be necessary to assure safe operation. Selection of the investment with the best LCCP (thus the minimum total GHG emissions) is recommended. The safe use of hydrocarbons, ammonia, CO_2 and other potential non-fluorocarbon substances also depends on technology and training that eliminate uncontrolled emissions. Containment strategies are equally applicable to fluorocarbons and non-fluorocarbons and help manufacturers choose technology with the best Life Cycle Climate Performance.

GLOBAL COMMUNICATIONS AND COLLABORATION

The U.S. is actively working to share technical information internationally. Since 1999, U.S. EPA has sponsored regular international technology conferences such as the Earth Technologies Forum, the SF_6 and the Environment: Emission Reduction Strategies Conference, and a workshop, in collaboration with the U.S. DoD and a number of other governments and Non-governmental Organizations (NGOs), on "The Importance of Military Organisations in Stratospheric Ozone and Climate Protection". As illustrated by the Mobile Air Conditioning Partnership, U.S. voluntary partnerships also increasingly include international industry organizations, NGOs and other governments. And U.S. EPA currently collaborates with a number of international industry organizations such as the International Magnesium Association, the International Aluminium Association, the Global Greenhouse Emissions Estimation Consortium, and the World Semiconductor Council.

This global coordination has several advantages. It:

1. Involves more companies.
2. Creates a "critical mass" of global researchers who collaborate on work.
3. Directs available funds to new work while using completed work to guide program and policy actions.
4. Harmonizes analytical input and advice necessary for regulatory approaches to maintain global markets and reduce compliance costs.
5. Speeds commercialization and implementation of best practices and best technology.
6. Simplifies communication of technical progress by joint publication of consensus reports.

SUMMARY AND EXPECTED OUTCOMES

HFCs, PFCs and SF_6 are significant for climate change because they have high global warming potentials and some have long atmospheric lifetimes. Although these greenhouse gases now represent less than 2% of the U.S. annual greenhouse gas emissions, regulatory and voluntary actions are being taken to stabilize or reduce emissions. The United State is committed to making cost-effective national emission reduction choices that protect both the ozone layer and climate without compromising other environmental, health and safety concerns.

High GWP gas use is critical in certain industrial sectors. Careful management of these materials is an essential component of U.S. climate and stratospheric ozone protection goals. U.S. programs for HFCs, PFCs and SF_6 pursue technically feasible and cost-effective emission reductions within an international and national framework for industry action. This strategy allows for long-term planning and investment in reducing all greenhouse gas emissions.

In addition to regulatory programs that target unnecessary emissions, public-private industry partnerships are substantially reducing US emissions of HFCs, PFCs and SF_6. These partnerships are successfully developing cost-effective improvements in processes and products that emit greenhouse gases and helping to facilitate the development of high quality data on emissions. Working directly with industry accelerates relevant scientific and technological research, supports the development of innovative operating practices and technologies, and facilitates information sharing for customized implementation of emission reduction methods.

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