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**Workshop for a dialogue on high global-warming-potential  
alternatives for ozone-depleting substances**  
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## **Current control measures, limits and information reporting requirements for high-global-warming potential alternatives to ozone-depleting substances: national and regional information**

### **Introduction**

1. Unless otherwise indicated, the following summaries are drawn from each country's fourth national communication on climate change and the date of publication is specified for each country. The European Community and its Member States have been listed separately. Only those reports that were available in English have been included.
2. The summaries set out the policies and measures implemented or proposed in each country, by both government and industries, to control emissions of hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs). Where available, information about limits on HFCs and PFCs and any national reporting requirements have also been summarized.
3. Under articles 4 and 12 of the Kyoto Protocol, Parties are obligated to prepare a national greenhouse gas inventory annually. Accordingly, while specific reporting requirements at the national level are often not described in the national reports, it is likely that there are reporting requirements in place. Furthermore, although most countries offered some projections for future levels of HFC and PFC emissions, only specific limits or goals to which countries expressly committed themselves were included in the present document. The summaries are being circulated, as submitted, without formal editing.

### **1. Australia (2005)**

#### **Control Measures:**

#### **Regulatory**

- *Ozone Protection and Synthetic Greenhouse Management Act:* In December 2003, the Australian Parliament passed legislative amendments to the Ozone Protection Act 1989, expanding it to the Ozone Protection and Synthetic Greenhouse Management Act 1989. The amendments:

- Extend import, export and manufacture controls to include synthetic greenhouse gases (HFCs and PFCs) that are used to replace ozone depleting substances.
- Extend import controls to include refrigeration and air conditioning equipment containing a hydrofluorocarbon or hydrochlorofluorocarbon refrigerant charge.
- Provide for introduction of consistent national standards for the handling, storage and disposal of ozone depleting substances and their synthetic greenhouse gas replacements.
- *End Use Controls:* In July 2005, Australia implemented end-use controls in the fire protection, refrigeration and air conditioning sectors. These controls establish consistent minimum standards for all people who work with gases in these industry sectors. They will ensure that only technicians who have the appropriate qualifications and skills to minimise emissions handle the gases. Businesses will be able to purchase the gases only when they can demonstrate they have the appropriate equipment and employ only appropriately licensed staff. End-use controls will be progressively developed for the foam, aerosol, solvent, laboratory and analytical research sectors.

**Research and Development/ Economic**

- *Industrial Process Regulation:* Under the Victorian Government’s State Environment Protection Policy (Air Quality Management), businesses subject to works approval and licensing by the Victorian Environment Protection Authority are required to:
  - Implement best practice with respect to energy efficiency and greenhouse gas emissions for new investments; and
  - Conduct energy audits for existing licensed premises and implement actions for which the implementation cost will be recovered through efficiency savings within three years.

In addition Australia has a variety of programmes that regulate GHGs generally including HFCs and PFCs including:

- Greenhouse Gas Abatement Programme
- Greenhouse Challenge Plus Programme (voluntary)
- Emissions trading.
- International climate change partnerships to reduce greenhouse gas emissions
  - Multilateral
  - Bilateral

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

The Australian Greenhouse Emissions Information System (AGEIS) integrates emissions estimation, reporting and data storage processes into a single system responsible for Australia’s national and state greenhouse gas inventories.

**2. Belarus (2007)**

**Control Measures:**

No control measures specific to HFCs and PFCs identified.

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

Resolution No 485 of the Council of Ministers of the Republic of Belarus on the “Approval of the Regulations for the Procedure of Maintaining the National Greenhouse Gas Inventory” (2006) defines the procedure for maintaining a national inventory. The Ministry of Natural Resources and Environmental Protection is responsible for maintaining the national greenhouse gas inventory based on information provided by other government bodies defined by the said resolution.

**3. Canada (2007)****Control Measures:***Research and Development*

- *Greenhouse Gas Verification Centre:* The only control measure in place for HFCs and PFCs in Canada is the Greenhouse Gas Verification Centre (The Centre). The Centre is an assistive program, intended to help domestic climate change initiatives to better quantify their GHG emissions and emission reductions. The Centre has addressed this by building a database and resource centre of GHG-related literature and tools, developing quantification and verification protocols, providing technical support and initiating a process whereby private sector companies could become accredited to verify GHG emissions and emission reductions.

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

Canada’s GHG registries maintain two primarily integrated registries:

- *The Canadian GHG Challenge Registry:* an entity-based registry of voluntary GHG Emissions Reduction Action Plans; and,
- *The Canadian GHG Reductions Registry:* a project-based registry of GHG reductions projects and their annual registered emissions reductions (RERs).

**4. Croatia (2007)****Control Measures:***Regulatory*

- The Environmental Protection Act (Official Gazette Nos. 82/94, 128/99) is the basic law regulating general issues of environmental protection in the Republic of Croatia. Regulation on Substances that Deplete the Ozone Layer (Official Gazette No. 120/05) provides for the phasing out of the consumption of ozone depleting substances, the handling of such substances and products in which they are contained, methods of collection, recovery and permanent disposal of such substances. The Regulation applies also to synthetic greenhouse gases (HFC, PFC, and SF6) and prohibits their selling, import/export and release into the air without a special permit.

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

The Croatian Environment Agency is the central institution for the collection of data and monitoring environmental reporting.

## 5. Iceland (2006)

### Control Measures:

#### *Regulatory*

- Currently the use of HFCs is banned in Iceland, with the exception of use for cooling systems and in certain medical applications. The fisheries and fish processing industries are the main users of HFCs. Many larger processing plants use NH<sub>3</sub> as a cooling agent, but smaller plants and ships commonly use HFCs.
- The 2002 climate change strategy set a goal of PFC emissions from aluminium smelters at 0.14 tons of CO<sub>2</sub> equivalents. As of the time of this communication aluminium plants had achieved their goal by introducing Best Available Technology in new production. Overall PFC emission reduction due to improved technology and process control in consultation with aluminium smelters has led to a 95% decrease in the amount of PFCs emitted per ton of aluminium produced during the period of 1990-2003.

### Limits:

The 2002 climate change strategy set a goal for PFC emissions of 0.14 tons of CO<sub>2</sub> equivalent per ton of aluminium.

### Reporting Requirements:

Importers of HFCs submit reports on their annual imports by different types of HFCs to the Environment and Food Agency of Iceland (EFA).

## 6. Japan (2006)

### Control Measures:

#### *Regulatory/ Voluntary*

- *Planned efforts made by industry, and promotion of development, etc. of substitute materials and use of substitute products for HFCs:* In response to the February 1998 “Guidelines for Measures to Limit Emissions of HFCs, etc. by Industry” voluntary action plans were formulated by 22 organizations in eight sectors (as of the date of the communication). The government was to continue to follow up on the progress of the action plans of industry in the Industrial Structure Council and work to improve the transparency and reliability of the action plans and improve the certainty of target achievement. Furthermore, the government proposed measures to support efforts made by businesses to limit emissions and urge commercial sectors that have not yet formulated action plans to do so and to publicize them.
- *Recovery of HFC Charged as Refrigerant in Equipment in Accordance with Laws, etc.:* The Government of Japan anticipated the recovery and destruction of HFCs in the refrigerant sector through appropriate operation of laws including the Law for Recycling of Specified Kinds of Home Appliances (Law No. 97 of 1998, also known as the Home Appliances Recycling Law), the Law for Ensuring the Implementation of Recovery and Destruction of Fluorocarbons concerning Specified Products (Law No. 64 of 2001, also known as the Fluorocarbons Recovery and Destruction Law) and the Law for the Recycling of End-of-Life Vehicles (Law No. 87 of 2002, also known as the End-of-Life Vehicle Recycling Law)

#### *Research and Development /Education/ Awareness Raising*

- The Government of Japan was to promote the use of new substitute materials for HFCs and PFCs, technologies that do not use HFCs and PFCs, and technologies and products for recovering and destroying HFCs and PFCs. To this end, the government would carry out research and development of new substitute materials and substitute technologies.
- Furthermore, taking into account safety, economy, energy efficiency, etc., the Government of Japan will provide information concerning technology and products using substitute materials and those products using the three fluorinated gases which have a smaller impact on global warming. The government will disseminate these products and technology, and educate the

public about them. In particular because of the restriction on HCFC-141b and the expected increase in the use of HFC as a foaming agent the Government has proposed to formulate policies to limit emissions of HFC and promote the use of foaming and heat insulation materials which do not contain fluorinated gases.

- Proposed measures to improve the energy conservation capability of buildings and houses were expected to result in increased use of heat insulation materials.
- Moreover, as it was expected that HFCs emitted as a result of the use of aerosol products using HFCs would increase, the Government of Japan planned to promote the development of substitute materials and substitute technology in this sector, disseminate those materials and technology, and educate the public about them.

**Limits:**

The target for the three fluorinated gases (HFC, PFC, and SF<sub>6</sub>) is a level of total emissions relative to the base year of +0.1 percent from the base year (1995) level (approximately 51 million t-CO<sub>2</sub>).

**Reporting Requirements**

In Japan the Law Concerning the Promotion of Measures to Cope with Global Warming stipulates that the government must create an emissions and removals inventory. Japan's emissions and removals inventory preparation process undergoes internal assessments through adjustments among the related ministries and agencies, and external assessments and reviews through the "Committee for the Greenhouse Gas Emission Estimation Methods" of Japan.

## 7. Liechtenstein (2005)

**Control Measures:**

*Regulatory*

- Since 1995 the "Ordinance on Dangerous Substances" has regulated the HFCs and PFCs. Under the ordinance several substances (especially those used in fire extinguishers and spray cans) have been banned. Only HFC-125 is a permissible substitute substance.

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

No reporting requirements with regard to HFCs and PFCs were identified.

## 8. Monaco (2006)

\*\*\* Document in French

## 9. New Zealand (2006)

**Control Measures:**

*Awareness Raising/ Education:*

- "No-loss campaign," a voluntary educational programme is aimed at improving the awareness of refrigeration and air conditioning engineers about the greenhouse gas risks associated with fluorocarbon refrigerants. The mechanism is education about a code of practice followed by an examination and issuance of a "No-Loss" card to those who are successful. The objective of this programme is to improve the management of fluorocarbon refrigerants and it covers both HFCs and PFCs. As of the time of this communication the programme was under implementation by refrigeration industry bodies.

**Limits**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements**

Under the Climate Change Response Act of 2002 the Ministry for the Environment is New Zealand's inventory agency, responsible for the overall development, compilation and submission of the annual green house gas inventory to the UNFCCC.

**10. Norway (2006)****Control Measures****Regulatory/ Voluntary:**

- In 1997 the major aluminium producers signed an agreement with the Ministry of the Environment to reduce the emission of GHGs (CO<sub>2</sub> and PFCs) by 55 percent per ton aluminium produced by 2005 (compared with 1990 levels). These goals appear to have been met. However the industry had already reduced their emission by 40 percent from 1990-1997, the year the agreement was signed. Therefore reductions were partially the result of voluntary action on the part of the aluminium industry.
- The introduction of emission reducing measures in the aluminium production industry, including improved technology, process control and conversion to Prebake technology reduced PFC emissions by 79 percent from 1990-2003. These are projected to reduce PFC emissions by 67 percent from 1990-2010.
- *Greenhouse Gas Emission Trading Act:* Norway provided for an emissions trading scheme from 2005-2007 which applied to 10-15 percent of Norway's total greenhouse gas emissions. As of the time of the last communication the government planned to put forward a proposal to Parliament to revise the national emissions trading scheme for the Kyoto Period of 2008-2012.

**Economic**

- *Tax Reimbursement Scheme:* In 2003, a tax was introduced on the importation and production of HFCs and PFCs. The tax is NOK 187 (approximately 23 Euro) per tonne CO<sub>2</sub> equivalents of gas imported or produced. In 2004, this tax was supplemented with a reimbursement scheme, which applies to all HFCs and PFCs delivered for destruction. This tax and reimbursement scheme was highly effective, at reducing HFC emissions, reducing emissions in the first year by 34 percent. However due to increased demand at the time of this communication, an increase in HFC emissions was not ruled out.

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

No reporting requirements with regard to HFCs and PFCs were identified.

**11. Russian Federation (2006)**

\*\*\* Document in Russian

**12. Switzerland (2005)****Control Measures:****Regulatory**

- *Ordinance Relating to Environmentally Hazardous Substances:* The Federal Act on the Protection of the Environment and specifically the "Ordinance Relating to Environmentally Hazardous Substances" (adopted 1986, revised in 1995 and 2003) provides measures to mitigate emissions from synthetic gases (HFCs, PFCs, and SF<sub>6</sub>). As of the time of this communication new provisions had been drawn in consultation with the cantons and the industrial and commercial sectors concerned.
- In the industrial processes sector, the use of PFCs, HFCs has been regulated in various areas through a climate-related "Amendment to the Ordinance relating to Environmentally Hazardous Substances" which was adopted in April 2003 and entered into force in stages between July 2003 and January 2004. The regulations cover the following areas:

- *Compressed gas containers* - Emissions of synthetic GHGs in this area can only be limited by restrictions on use. In Switzerland the only applications for which exemptions are required are inhaler sprays for the treatment of chronic respiratory diseases, compressed gas containers for cleaning live electrical and electronic equipment, and polyurethane spray foam in certain situations where safety is critical. The state of technology was to be defined in guidelines developed in collaboration with the professional circles concerned. Temporary exceptions for other applications where these substances may perhaps be required, e.g. for safety reasons is based on individual requests. Furthermore, the “Ordinance Relating to Spray Cans of 26 June 1995” prohibits the use of HFCs or PFCs in most spray cans. It only allows the use of HFC-152a as a propellant in spray cans containing cosmetics and household products.
- *Foams* – As of this communication the only measures currently available in Switzerland to significantly limit synthetic GHG emissions from plastic foams involve restrictions on use. As insulating foams without fluorinated gases already account for well over half of the Swiss market the regulations permit the use of synthetic GHGs in plastic insulating foams only where no environmentally superior alternative is available according to the current state of technology.
- *Solvents* - The use of synthetic GHGs as solvents in commercial products is mainly emissive. Therefore the only way to limit emissions is by restricting the use of such products. Solvents containing synthetic GHGs are currently used almost exclusively by industry, and some of them are still found to be necessary, depending on the state of technology. To ensure confinement, consumer goods containing such solvents have been banned and the current provisions of the “Ordinance on Air Pollution Control” applicable to professional uses have been slightly modified so that they cover all regulated substances. Consequently, synthetic GHGs will be subject to the same provisions as chlorinated organic substances, such as perchloroethylene. These regulatory provisions are accompanied by a 10-year deadline for bringing existing equipment into line (as of 2005).
- *Refrigerants* - Without regulatory measures in the area of refrigeration and air conditioning, this sector was projected to be the source of more than half the emissions of synthetic GHGs in Switzerland by 2010. Industrial refrigeration and mobile air conditioning were the main sub-sectors responsible. A mixed regulatory system was implemented, comprising: (a) a timetable of specific bans for certain categories of household appliances (refrigerators, freezers, air conditioners), accompanied by a system of individual exemptions when no alternatives are available; (b) a ban on the use of synthetic GHGs in mobile air conditioners, coming into force when permitted by the state of technology; (c) an authorization procedure, based on the state of technology and the quality of confinement, for fixed installations and for heat pumps working with more than 3 kg of synthetic GHGs; and (d) measures to reduce emissions (periodic checking for leakage, maintenance records, notification of installations) required for mobile and fixed installations containing more than 3 kg of refrigerant. To ensure the transparency and proportionality of this relatively complex system, several technical guidelines relating to the relevant technology and to the implementation of the various measures to improve confinement have been developed in collaboration with the sector concerned, and with the regional authorities.
- *Fire protection* - The 1996 ban on the supply and import of extinguishing agents made of synthetic GHGs and of appliances or stationary equipment containing such agents has been maintained and adapted.
- *Other application sectors* - Among the former applications of PFCs in Switzerland, use in tyres and insulating windows is no longer authorized. Taking into account the particular situation in the area of sports shoes, a transitional exemption until 2006 was granted. Other uses are authorized insofar as there is no environmentally superior alternative and when emissions are reduced to a minimum according to the best available techniques. Furthermore, under Annex 2 of the “Ordinance on the Movement of Toxic Waste,” waste containing HFCs and PFCs counts as special waste. Thus, the movement of such waste is controlled, and it must be treated by licensed enterprises in an environmentally sound manner.

**Limits:**

The objective of the limits under the “Amendment of the Ordinance about Environmentally Hazardous Substances” is the stabilization of synthetic GHGs’ emissions at a level below 1000 Gg CO<sub>2</sub> eq.

**Reporting Requirements:**

The Swiss National Inventory System (NIS) is developed and managed under the auspices of the Department of Environment, Transport, Energy and Communications (DETEC). It is hosted by a DETEC agency, the Swiss Agency for the Environment, Forests and Landscape (SAEFL), which is the national entity with overall responsibility for the GHG inventory.

**13. Turkey (2007)**

Note: This is Turkey’s 1st National Communication on Climate Change.

**Control Measures**

No control measures specific to HFCs and PFCs were identified.

**Limits**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

The Turkish Statistics Institute (TURKSTAT) is the designated body responsible for the compilation and updating of the National GHG Inventory in the country.

**14. Ukraine (2006)**

\*\*\* Document in Russian

**15. United States of America (2006)**

**Control Measures**

*Regulatory*

- *High-GWP Program* - The United States is one of the first nations to develop and implement a national strategy to control emissions of high-GWP gases. The strategy is a combination of industry partnerships and regulatory mechanisms to minimize atmospheric releases of HFCs and PFCs while ensuring a safe, rapid, and cost-effective transition away from ozone-depleting substances across multiple industry sectors.

*Voluntary*

- *Environmental Stewardship* - The objective of this initiative is to limit emissions of HFCs, PFCs, and SF<sub>6</sub> in three industrial applications:
  - Semiconductor production
  - Electric power distribution
  - Magnesium production
- *Voluntary Aluminium Industry Partnership* - This partnership has continued to reduce CF<sub>4</sub> and C<sub>2</sub>F<sub>6</sub> where cost-effective technologies and practices are technically feasible. Since 2002, the partnership expanded its reduction goal to reduce direct carbon emissions from anode consumption as well as PFCs. EPA estimates that the partnership reduced PFC emissions by 7 Tg CO<sub>2</sub> Eq. in 2002 and projects reductions of 10 Tg CO<sub>2</sub> Eq. in 2012.
- *Mobile Air Conditioning Climate Protection Partnership* - Announced in 2004, the Mobile Air Conditioning Climate Protection Partnership is striving to reduce GHG emissions from vehicle air conditioning systems through voluntary approaches. The program will identify near-term opportunities to improve the environmental performance of mobile air conditioners and to promote cost-effective designs and improved service procedures that minimize emissions from mobile air conditioning systems. Partnership members are pursuing two goals: reduce fuel consumption from the operation of vehicle air conditioning by at least 30 percent, and reduce

direct refrigerant emissions by 50 percent, thereby avoiding emissions of HFC-134a. Drivers will save money by using less fuel, and will benefit from improved air conditioning reliability due to improved technology. EPA estimates that this effort will avoid more than 5 Tg CO<sub>2</sub> Eq. in 2012.

- *Voluntary Code of Practice for the Reduction of Emissions of HFC & PFC Fire Protection Agents* - In 2002, the EPA and several hundred equipment and chemical manufacturers and distributors representing the U.S. fire protection industry launched the “Voluntary Code of Practice for the Reduction of Emissions of HFC & PFC Fire Protection Agents” (VCOP). Successful implementation of VCOP would have achieved the dual goals of minimizing non-fire emissions of HFCs and PFCs, used as fire-suppression alternatives to ozone-depleting halons, and continuing to protect people and property from the threat of fire through the use of proven, effective products and systems.

#### **Research and Development:**

- *HFC-23* - This partnership continued to encourage companies to develop and implement technically feasible, cost-effective processing practices or technologies to reduce HFC-23 emissions from the manufacture of the ozone-depleting substance HCFC-22. Compared to the Business As Usual case in 2002, there was a reduction of 17 Tg CO<sub>2</sub> Eq. EPA estimates a reduction of 16 Tg CO<sub>2</sub> Eq. for 2012, which is lower than EPA anticipated in 2002.
- *Significant New Alternatives Program* - Since the 2002 Climate Action Report (CAR), the “Significant New Alternatives Program” (SNAP) has continued its progress in phasing down the use of ozone-depleting substances (ODS), such as CFCs and HCFCs. SNAP has worked closely with industry to research, identify, and implement climate and ozone friendly alternatives, supporting a smooth transition to these new technologies. In addition, SNAP has initiated programs with different industry sectors to monitor and minimize emissions of global-warming gases, such as HFCs and PFCs used as substitutes for ozone-depleting chemicals. By limiting use of these gases in specific applications where safe alternatives are available, SNAP reduced emissions by an estimated 26 Tg CO<sub>2</sub> Eq. in 2002 and is projected to reduce emissions by 150 Tg CO<sub>2</sub> Eq. in 2012.
- *Green Grocer* – As of this communication EPA was working with supermarket companies and equipment manufacturers to promote the deployment of new, energy-efficient technologies that reduce emissions of fluorocarbon refrigerants (including HFCs). The first stage of this program was underway and included EPA and industry evaluations of the performance, feasibility, costs, and benefits of alternative systems in stores.

#### **Limits:**

California imposes a state wide GHG Emission cap but otherwise there were no nation wide limits identified.

#### **Reporting Requirements:**

Revised Guidelines for Voluntary Greenhouse Gas Emissions Reporting under section 1605(b) of the Energy Policy Act of 1992 are intended to encourage utilities, industries, farmers, landowners, and other participants to submit comprehensive reports on their emissions and emissions reductions to an on-line registry, including sequestration. Effective as of 2007 there were to be new general and technical guidelines for reporting for the 2006-reporting year.

#### **EC and its Member States**

For those countries within the European Community the Regulations and Directives adopted by the EC apply. It is also important to note that the Regulation on Certain Fluorinated Gases and Directive on Mobile Air Conditioning Systems though only proposals as of the 4th National Communications were both adopted by the European Parliament and Council on May 17th 2006. The Regulation on Fluorinated Gases came into direct application in all Member States as of July 2007 and the Directive on Mobile Air Conditioning Systems had to be transposed by the Member States in their legal systems by January 2008.

## 1. European Community (2006)

### Control Measures:

#### Regulatory

- There are two elements to the Commission proposal in the Common Position (COM (2001) 68 final-7/2/2001 *Green Paper on Integrated Product Policy*) adopted by Council on 20 June 2005 (COM(2003) 492 final, 11<sup>th</sup> August 2003), which were subsequently split into two separate legal texts:
  - *Regulation on Certain Fluorinated Gases* (Regulation (EC) No 842/2006) - A regulation on containment, recovery, training and certification, prohibitions, use bans and reporting of F-gases. The proposal puts into place a legislative framework to reduce emissions of fluorinated gases. The primary focus is on new requirements for the containment, recovery, training and certification of personnel involved in maintaining equipment containing fluorinated gases. A secondary aspect is concerned with a limited number of marketing bans for specific fluorinated gases in specified applications. These harmonized restrictions have been agreed on the basis of extensive stakeholder consultation and following cost-benefit analyses. This directive was to be implemented by the EU and Member States.
  - *Directive on Mobile Air Conditioning Systems in Motor Vehicles* (Directive 2006/40/EC) - The Common Position on mobile air conditioning systems prohibits the placing on the market of passenger cars with HFC 134a mobile air conditioners in new passenger cars from 2011 and in all passenger cars from 2017. This directive was to be implemented by the EU and vehicle manufacturers.
- *Directive on End-of-Life Vehicles*: Effects fluorinated gases generally by regulating the acceptance of used vehicles and recovery by their producers. The directive mandates the separation and treatment of air conditioning fluids.
- *The Directive on Waste Electrical and Electronic Equipment (WEEE)*: WEEE came into force in 2002. The directive mandates the separation and treatment of CFC, HCFC, HFC and HC and refers to the regulation on ozone depleting substances.
- There is also an “Integrated Pollution Prevention and Control” (IPPC) Directive which regulates all GHGs generally.

#### Voluntary:

- The “Voluntary Framework Guidelines for Good Practice” affect all GHGs. The objective is to promote voluntary action as part of an appropriate mix of policy instruments and to promote best practice.

### Limits:

The Regulation on Fluorinated Greenhouse Gases limits certain products with fluorinated gases on the market as of particular dates. For example, the use of PFCs in fire protection systems and fire extinguishers was banned as of July 4<sup>th</sup> 2007 and as of July 4<sup>th</sup> 2009 the use of HFCs in novelty aerosols is to be banned.

Under the Directive on Mobile Air Conditioning Systems there are multiple limits on fluorinated gases. For instance as of January 1<sup>st</sup> 2017 new vehicles fitted with air conditioning systems designed to contain fluorinated greenhouse gasses with a GWP higher than 150 are to be refused registration and their entry in to service and sale is to be prohibited. Similarly as of January 1<sup>st</sup> 2011 air conditioning systems are not to be retrofitted or refilled with fluorinated greenhouse gases with a GWP higher than 150 and systems fitted with an air conditioning system so designed are not to be granted EC type-approval or national-type approval.

### Reporting Requirements:

With regard to fluorinated gases the Directive on Fluorinated Gases, includes requirements for the reporting of F-gases. For instance by March 31<sup>st</sup> 2008 and every year thereafter producers, importers and exporters of fluorinated greenhouse gases were to report to the commission and Member State concerned, the amount of fluorinated gases they have placed on the market, amount recycled, reclaimed or destroyed, total production per application, etc.

## European Community Member States:

### 2. Austria (2006)

#### Control Measures:

##### *Regulatory*

- *Regulation on Bans and Restrictions of HFCs, PFCs and SF6:* In December 2002, the relevant Austrian Ordinance entered into force. It aimed to reduce and phase-out the use of HFCs, PFCs and SF6 in all relevant applications on the basis of the Federal Chemicals Act. That measure has been the most important step of the Austrian government's strategy to mitigate or avoid future GHG emissions from fluorinated gases.
- *Public Procurement and Support Measures:* In order to give market incentives for "early phase-out", prior to full entry into force of the above-mentioned regulation, the Federation and the Länder were to take relevant action regarding the use of products equipped with fluorinated gases within public procurement guidelines, either for deliveries (e.g. cooling equipment) or construction services.
- *Avoidance of leakage:* The EU regulation, which entered into force in mid-2006 aimed at reducing emission by leakage control and inspections on a regular basis, especially in the sector of refrigeration and air conditioning, but also in other smaller sectors.
- Aluminium production in Austria was terminated in 1992 and PFC emissions have decreased remarkably. Therefore, since 1992 the main source of PFC emissions has been semiconductor manufacturing.

##### *Research and Development/ Economic*

- *Housing Support Schemes:* a Constitutional Treaty between Federation and Länder aimed to optimise the use of subsidies for housing schemes by introducing minimum standards with respect to energy profiles including:
  - Thermal insulation of dwellings.
  - *Support schemes for energy efficient construction:* provides subsidies for energy efficient construction (improved insulation, zero energy houses etc.) and the use of renewable energy sources, such as heating systems based on biomass and solar installations.
  - *Housing support for use of renewable energy:* provides both financial support and information campaigns for highly efficient systems based on renewable energy (solar or biomass) or natural gas.

##### *Awareness Raising/ Educational*

- Special topics information campaigns on the ban of HFCs in municipal procurement.

#### Limits:

No specific limits on HFCs and PFCs were identified.

#### Reporting Requirements:

*Umweltbundesamt* is the single national entity with overall responsibility for national GHG inventory by law. The main data source for the Austrian inventory preparation is the Austrian statistical office (Statistics Austria). There are also National and European reporting obligations as well as reports of companies and associations.

### 3. **Belgium (2006)**

#### **Control Measures:**

##### *Regulatory*

- As of this communication the three regions (Walloon, Flemish and Brussels-Capital regions) were about to adopt regulations related to stationary applications containing refrigerant gases (refrigeration, air conditioning and heat pump equipment) including:
  - A regulation concerning the operators of such equipment (already adopted in the Flemish and Brussels-Capital Regions) and;
  - A regulation laying down rules for the certification of personnel (in preparation in the three regions; a proposal had already been adopted at first reading by the governments of the Flemish and Brussels-Capital Regions).
- HFCs and all scrapped equipment containing HFCs are considered as hazardous waste for which specific rules apply for recovery, collection and processing.
- EU Environment Council's Regulation on Fluorinated Greenhouse Gases and Directive on Emissions from Air Conditioning Systems in Motor Vehicles. (See European Community above).

##### *Voluntary*

- Agreements with industrial sectors.

#### **Limits:**

No specific limits on HFCs and PFCs were identified.

#### **Reporting Requirements:**

The Coordination Committee for International Environment Policy (CCIEP) Emissions Working Group is charged with preparing the national inventories of atmospheric pollutant and greenhouse gas emissions in accordance with European and international reporting obligations.

### 4. **Bulgaria (2006)**

#### **Control Measures:**

There were no measures specifically tailored to HFCs and PFCs identified in the communication. However Bulgaria had implemented programs to reduce greenhouse gases generally, including research and development and awareness raising and education, and financial incentives for emission reduction.

#### **Limits**

No specific limits on HFCs and PFCs were identified.

#### **Reporting Requirements**

The "Law on Statistics" (Star Gazette 25.06.1999) includes national and international monitoring and reporting obligations with regard to greenhouse gas emissions.

### 5. **Czech Republic (2005)**

#### **Control Measures:**

No control measures specific to HFCs and PFCs were identified.

#### **Limits:**

No specific limits on HFCs and PFCs were identified.

#### **Reporting Requirements:**

The Czech Republic has a national inventory system and the Czech Hydrometeorological Institute has performed an inventory of greenhouse gas emissions since 1995.

## 6. Denmark (2005)

### Control Measures:

#### *Regulatory*

- Import, sale and use of the substances or new products containing HFCs and PFCs were forbidden beginning 1 January 2006 with some exceptions.

#### *Research and Development*

- *Enterprise Scheme on HFCs:* A general enterprise scheme was to be administered by the Danish Environmental Protection Agency. The total budget for the period 2004-2007 was DKK 144 mill. The general objective of the enterprise scheme is to promote better conditions for environmental improvements in enterprises. Included in the general enterprise scheme was a budget share of DKK 12 mill. 2005-2007 for projects to develop alternatives to HFCs in the refrigerating business and establish a “knowledge center” for HFC-free cooling to disseminate knowledge and offer technical advice.

#### *Economic*

- *Tax on HFC/PFCs Importation:* The tax is payable whether the substances are imported as pure substances or are part of imported products. If the content in the products is not known, the tax is based on a fixed tariff. The tax is differentiated in accordance with the global warming potential of the substance with DKK 0.1 per kilogramme of CO<sub>2</sub> equivalents as the general principle and with DKK 400 per kilogramme of CO<sub>2</sub> equivalents as a general upper limit.

### Limits:

No specific limits on HFCs and PFCs were identified.

### Reporting Requirements:

The Danish National Environmental Research Institute (NERI) is responsible for producing the Danish greenhouse gas emission inventories and annual reporting to the UNFCCC.

## 7. Estonia (2005)

### Control Measures:

#### *Regulatory/ Research and Development*

- *Enhancing the capacity to reduce the emissions of fluorinated greenhouse gases in Estonia:* This project, proposed in 2005, was to assess the extent to which the current system for ozone depleting substances could be used in the context of fluorinated gases and what additional activities need to be taken. In addition, all inventories, strategies, programmes, guidelines, standards, legislative provisions etc. as well as public and industry awareness events and training sessions were to be conducted with an aim to first stabilize the emissions of fluorinated gases and eventually reducing the emissions. The project was to prepare Estonia for better implementation of the Kyoto Protocol as well as the EU’s “Regulation on fluorinated greenhouse gases” and “Proposal for a Directive relating to emissions from air conditioning systems in motor vehicles.”

### Limits:

No specific limits on HFCs and PFCs were identified.

### Reporting Requirements:

The Ozone and Climate Unit at the Estonian Environmental Research Centre (EERC) is responsible for collecting data on ozone depleting substances and has included information on HFCs where relevant but as of this communication there were still major gaps in the collected data on fluorinated gases.

## 8. Finland (2006)

### Control Measures:

No additional programs besides the EU Environment Council's Regulation on Fluorinated Greenhouse Gases and Directive on Emissions from Air Conditioning Systems in Motor Vehicles were identified. (See European Community above).

### Limits:

No specific limits on HFCs and PFCs were identified.

### Reporting Requirements:

The Finnish Environment Institute prepares the emission estimates on the F-gases for the national reports.

## 9. France (2006)

\*\*\*Document in French.

## 10. Germany (2006)

### Control Measures:

#### *Regulatory*

- *XPS Rigid Foam and PU Foam:* Under the EU Directive (to limit and reduce emissions of certain fluorinated greenhouse gases) the HFCs still used in expanding PU foam were to be replaced except in certain safety-relevant applications. The reduction effect of the proposed regulatory measures is estimated at 1.4 - 2.8 million tonnes CO<sub>2</sub> equivalent by 2010. Thanks to voluntary measures already implemented by industry, a reduction effect of 1.3 million tonnes CO<sub>2</sub> equivalent has already been achieved.
- *Stationary and mobile air-conditioning systems compulsory servicing requirement:* Under the regulation on certain fluorinated greenhouse gases which was proposed by the European Commission in 2003, this area was to be covered by community legislation. The introduction of this measure was planned as an implementation of the EU Regulation on fluorinated greenhouse gases. In addition to an annual servicing requirement, it also envisaged a requirement for low-emission disposal and minimum requirements regarding prevention of system leaks.
- EU Environment Council's Regulation on Fluorinated Greenhouse Gases and Directive on Emissions from Air Conditioning Systems in Motor Vehicles. (See European Community above).

#### *Research and Development*

- *Modernization and optimization in aluminium production:* Led to a 71 percent reduction in CO<sub>2</sub> equivalent of fluorinated carbon emissions within the aluminium sector between 1995-2002. As of this communication further modernization was expected to bring about an even greater reduction.

#### *Voluntary:*

- *Semiconductor Production:* In 1999 the World Semiconductor Council (WSC) undertook to achieve a 10-percent reduction in emissions of fluorinated gases by 2010 compared with 1995. The European association has presented a similar undertaking to the EU Commission, and the manufacturers producing in Germany have, as a national voluntary undertaking pledged an emission reduction of at least 8 percent despite growing production.
- *Declaration by German Industry on Global Warming Prevention II:* Voluntary undertaking by German industry on emission reduction committing to the reduction in Kyoto gases (including fluorinated gases) by 2012 by 35 percent compared with 1990 levels.
- *Replacement of metering aerosols containing HFC:* This measure relates among other things to the replacement of HFC used as a propellant gas in medical aerosols (e.g. for the treatment of

asthma) by promoting the market share of powder inhalers. The Federal Government continues to regard voluntary measures as particularly appropriate in this field. A reduction of up to 0.5 million tonnes CO<sub>2</sub> equivalent is expected by 2010.

- Replacement of HFCs in other aerosols was also noted in the discussion of measures. While regulatory bans on the use of HFCs were considered for certain areas (e.g. cosmetic products), voluntary replacements were thought to be a possibility for other areas (e.g. technical sprays). Other measures are also under discussion, especially for new applications; but as of this communication their implementation was still an open question.

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

The Federal Environmental Agency produces the National Inventory Reports.

## 11. Greece (2006)

**Control Measures:**

No additional control measures besides the EU Environment Council's Directive on Emissions from Air Conditioning Systems in Motor Vehicles were identified. (See European Community above).

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

The Ministry for the Environment has designated, on a contract basis, the National Observatory of Athens (NOA) as the national institution that has the overall technical responsibility for the compilation of the annual national inventory.

## 12. Hungary (2006)

**Control Measures:**

No control measures specific to HFCs and PFCs were identified.

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

Hungary's Greenhouse Gas Inventory is compiled by the National Directorate for Environment, Nature and Water. The National Inventory Report is compiled by the Ministry for Environment and Water of Hungary.

## 13. Ireland (2007)

**Control Measures:**

No additional control measures besides The EU Environment Council's Regulation on Fluorinated Greenhouse Gases and Directive on Emissions from Air Conditioning Systems in Motor Vehicles were identified. (See European Community above).

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

The national greenhouse gas inventory is compiled by the Environmental Protection Agency (EPA).

#### 14. Italy (2007)

**Control Measures:**

No additional control measures besides EU Environment Council's Regulation on Fluorinated Greenhouse Gases and Directive on Emissions from Air Conditioning Systems in Motor Vehicles were identified. (See European Community above).

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

Italy has established a national system, which includes all institutional, legal, and procedural arrangements for estimating emissions and removals of greenhouse gases, and for reporting and archiving inventory information. Inventory is compiled by the "Agency for the Protection of the Environment and for Technical Services" (APAT).

#### 15. Latvia (2006)

**Control Measures:**

*Regulatory/ Economic*

- Several legislative documents regulating the circulation of products and equipment containing fluorinated greenhouse gases have been adopted. For example in 2005 the cabinet of Ministers adopted regulations on the ozone layer depleting substances and fluorinated GHGs that are used as refrigerants.
- Latvia's law "On Pollution" (2001) regulates the environmental impact of industrial enterprise through the issuance of integrated pollution permits.

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

Latvia's GHG inventory is prepared in co-operation with the Central Statistical Bureau of Latvia, Ministry of transport, Ministry of Agriculture, State and Land Service, private institutions and sector experts.

#### 16. Lithuania (2005)

**Control Measures:**

HFCs and PFCs are not produced in Lithuania and their national consumption is covered only by import. No control measures specific to HFCs and PFCs were identified.

**Limits:**

No specific limits on HFCs and PFCs were identified.

**Reporting Requirements:**

Inventory of GHG emissions is performed by the Ministry of Environment (Environmental Quality Department, Air Division).

#### 17. Luxembourg

\*\*\*French only

## 18. Netherlands (2005)

### Control Measures:

#### *Regulatory*

- As of this communication there was only one producer of HCFC-22 in the Netherlands. The environmental permit for this plant required installation of an afterburner to reduce emissions of HFC-33.
- Within the context of the Reduction Programme for Non-CO<sub>2</sub> Gases, agreements were reached between government and industry to reduce emissions of HFC and PFC resulting from their stationary cooling equipment, car air-conditioning systems, foams, spray cans and the semiconductor industry.
- The Dutch Government has negotiated an environmental covenant with the aluminium industry that incorporates emission-reduction targets for a large number of pollutants including PFCs.
- As of 2003 both aluminium production plants in the Netherlands had switched from Side-Worked Prebake to Pointfeeder Prebake, which also reduced PFCs.

#### *Economic/ Development*

- The Dutch Government has provided financial support for Non-CO<sub>2</sub> Reduction Programmes to modernize production plants, which has resulted in a reduction of PFC emissions.

### Limits:

The environmental permit for the semi-conductor industry sets a ceiling of 0.44 Mtonne of SF<sub>6</sub>/ PFC emissions. For the aluminium industry there are also maximum PFC emission levels.

### Reporting Requirements:

The Ministry for Spatial Planning, Housing, and the Environment (VROM) is responsible for coordinating, monitoring, and reporting for climate change policy for the National Inventory System. Furthermore, a large number of companies are legally required to submit an Annual Environmental Report (MJV).

## 19. Poland (2006)

### Control Measures

No additional control measures besides The EU Environment Council's Regulation on Fluorinated Greenhouse Gases and Directive on Emissions from Air Conditioning Systems in Motor Vehicles were identified. (See European Community above).

### Limits:

No specific limits on HFCs and PFCs were identified.

### Reporting Requirements:

The Minister of the Environment is responsible for compiling the National Inventory Report.

## 20. Portugal (2006)

### Control Measures:

No additional control measures besides The EU Environment Council's Regulation on Fluorinated Greenhouse Gases were identified. (See European Community above).

### Limits:

No specific limits on HFCs and PFCs were identified.

### Reporting Requirements:

The Institute for the Environment (IA) is responsible for the overall coordination and updating of the National Inventory of Emissions by Sources and Removals by Sinks of Air Pollutants (INERPA).

## 21. Romania (2006)

### **Control Measures:**

No control measures specific to HFCs and PFCs identified.

### **Limits:**

No specific limits on HFCs and PFCs were identified.

### **Reporting Requirements:**

Data for the industrial processes sector was compiled by the National Institute for Statistics, 42 local environmental protection agencies and the industrial companies themselves.

## 22. Slovakia (2005)

### **Control Measures:**

#### ***Regulatory/ Research and Development:***

- Legal framework with regard to HFCs and PFCs was adjusted to EU standards. It involves requirements for collection, recycling and final disposal of coolants, non-returnable packages, and application of coolants in different sectors.
- As of this communication Slovakia had also approved measures to modernize the production of aluminium.
- There were also measures implemented to reduce HFC emissions in compliance with EU regulation.
- Slovakia also implemented directive 2002/96/EC on Waste from Electric Equipment which carries an obligation to remove all HFC prior to recycling. (See European Community above).

### **Limits:**

No specific limits on HFCs and PFCs were identified.

### **Reporting Requirements:**

The Slovak Hydrometeorological Institute Department of Air Quality collects the emission balances developed by external experts which is then controlled and re-calculated.

## 23. Slovenia (2006)

### **Control Measures**

#### ***Regulatory:***

- Slovenia's "Action Plan for Reducing GHG Emissions" (AP-GHG), which was adopted in July 2003 and supplemented in 2004, contains 22 instruments for implementing measures to reduce GHG emissions including the reduction of emissions of F-gases.
- The EU Environment Council's Regulation on Fluorinated Greenhouse Gases. (See European Community above).

### **Limits:**

No specific limits on HFCs and PFCs were identified.

### **Reporting Requirements:**

No reporting requirements with regard to HFCs and PFCs were identified.

## 24. Spain (2006)

\*\*\* Document in Spanish

## 25. Sweden (2005)

### Control Measures:

#### *Regulatory*

- The EU Environment Council's Regulation on Fluorinated Greenhouse Gases and Directive on Emissions from Air Conditioning Systems in Motor Vehicles. (See European Community above).
- *General Rules of Consideration in the Environmental Code*: Emissions of fluorinated gases from industrial processes are also covered by the "General Rules of Consideration in the Environmental Code" IVL2004. These are particularly relevant to emissions of PFCs from aluminium production. It is estimated PFC emissions will be reduced by at least 0.2 million tonnes of carbon dioxide equivalent a year as a result of application of the rules contained in the Environmental Code in permit examination.

### Limits:

No specific limits on HFCs and PFCs were identified.

### Reporting Requirements:

Emissions from industrial processes and the use of fluorinated greenhouse gases are predominantly calculated on the basis of figures from two types of information sources:

- Environmental reports or other information direct from companies.
- Official statistics or other information at the national level (for example from industry organizations).

Under Swedish environmental legislation, companies that undertake environmentally hazardous operations for which a permit is required have to present an account of their operations in an environmental report. Figures relating to emissions presented in environmental reports are principally based on measurements, mass balances or calculations using installation-specific or nationally developed emission factors.

The "Ordinance (2005:626) Concerning Climate Reporting" provides the legal basis for the national system and identifies various government agencies that are to take part in the reporting system.

## 26. United Kingdom (2006)

### Control Measures:

#### *Regulatory/ Research and Development*

- EU Environment Council's Regulation on Fluorinated Greenhouse Gases and Directive on Emissions from Air Conditioning Systems in Motor Vehicles. (See European Community above).
- Introduction of thermal oxidiser pollution abatement equipment at the two UK plants where HCFC-22 is manufactured led to a reduction in emissions of HFCs by 42.8 per cent, from 4.2 MtC in 1995 to 2.4 MtC in 2004.
- Improved technology in the aluminium production sector led to lower process emissions and in turn emissions of PFCs fell by 25.2 percent between 1995 and 2004.

### Limits

No specific limits on HFCs and PFCs were identified.

### Reporting Requirements

The UK's greenhouse gas inventory is compiled under contract to Defra by the National Environmental Technology Centre (NETCEN).