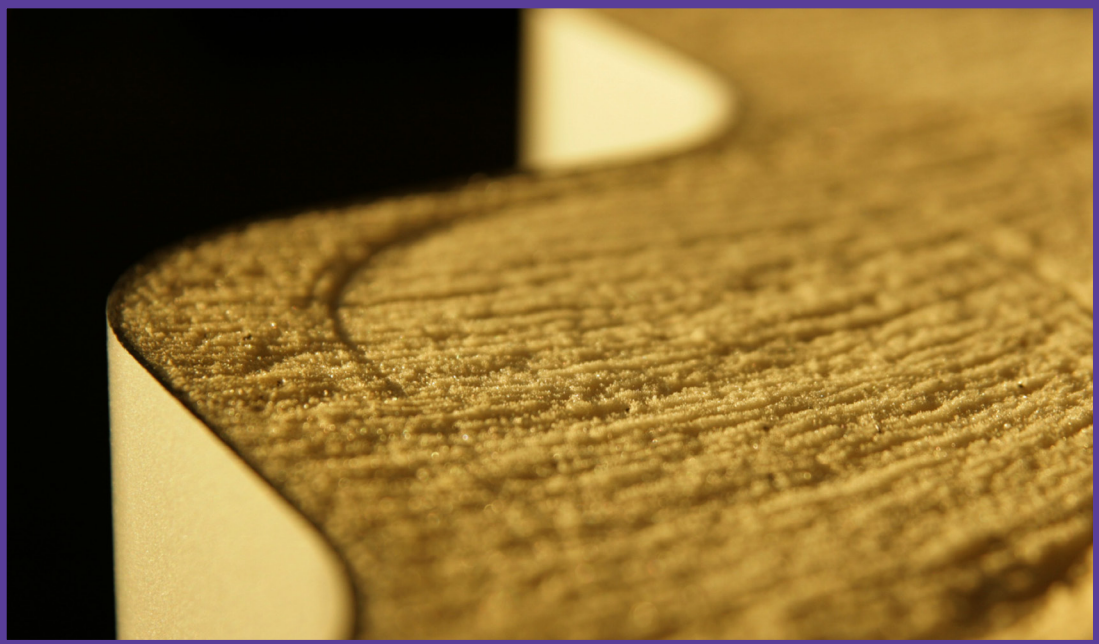
UNEP

HCFC POLICY & LEGISLATIVE OPTIONS

A guide for developing countries



UNITED NATIONS ENVIRONMENT PROGRAMME

Cover photo courtesy of:
Hennecke GmbH
D-53754 Sankt Augustin
Germany
www.hennecke.com

Disclaimer

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the United Nations Environment Programme concerning the legal status of any country, territory, city or area or of its authorities, or concerning delimitation of its frontiers or boundaries. Moreover, the views expressed do not necessarily represent the decision or the stated policy of the United Nations Environment Programme, nor does citing of trade names or commercial processes constitute endorsement.

ISBN: 978-92-807-3078-4

UNEP

Multilateral Fund for the Implementation of the Montreal Protocol

with funding by the European Union

HCFC policy & legislative options

A guide for developing countries

United Nations Environment Programme
Division of Technology, Industry and Economics (DTIE) OzonAction Programme
15 rue de Milan
75441 Paris CEDEX 09,
France

The Secretariat of the
Multilateral Fund for the
Implementation of the Montreal Protocol
Suite 4100
1000, de la Gauchetière Street West
Montréal, Québec
H3B 4W5 Canada

European Commission
DG Climate Action
Unit C.2 - Transport and Ozone
Avenue de Beaulieu 5
B-1160 Brussels
Belgium

Acknowledgements

This publication was produced by the UNEP Division on Technology, Industry and Economics (DTIE) OzonAction Programme as part of UNEP's work programme under the Multilateral Fund for the Implementation of the Montreal Protocol and with the financial assistance of the European Union in the framework of the "JumpStart" project to encourage developing countries to expedite their compliance with the HCFC phase-out obligations and adopt environmentally friendly alternatives to HCFCs. The factsheets used as the basis for developing this document were produced by the Compli ance Assistance Programme (CAP) team for Europe and Central Asia for use in that Regional Network of Ozone Officers. The views expressed herein can in no way be taken to reflect the official opinion of the European Union

The project was managed by the following team in the OzonAction Branch, UNEP DTIE, France:

Mr. Rajendra Shende
Head of Branch

Mr. James S. Curlin
Interim Network and Policy Manager

Mr. Halvart Koeppen
Regional Network Coordinator
Europe & Central Asia

Mr. Ruperto De Jesus
Programme Assistant

Ms. Mugure Kibe Ursulet
Documentation Assistant

This publication was written by:

Dr. Janusz Kozakiewicz
Associate Professor
Head of Ozone Layer and
Climate Protection Unit, ICRI,
Poland

The quality review was undertaken by:

Dr. Ezra Clark
Programme Officer
OzonAction Branch, UNEP DTIE, France

Mr. Etienne Gonin
Project Coordinating Consultant
EC JumpStart Project, OzonAction Branch, UNEP DTIE, France

Ms. Mirian Vega
Regional Network Coordinator
Latin America & the Caribbean
OzonAction CAP, UNEP
Regional Officer for
Latin America &
the Caribbean Panama City

Ms. Ludgarde Coppens
Policy and Enforcement Officer OzonAction CAP, UNEP Regional
Officer for Asia and Pacific, Bangkok

Mr. Shaofeng Hu
Regional Network Coordinator
Pacific Island Countries
OzonAction CAP, UNEP
Regional Officer for Asia and
Pacific, Bangkok

Power of Policies

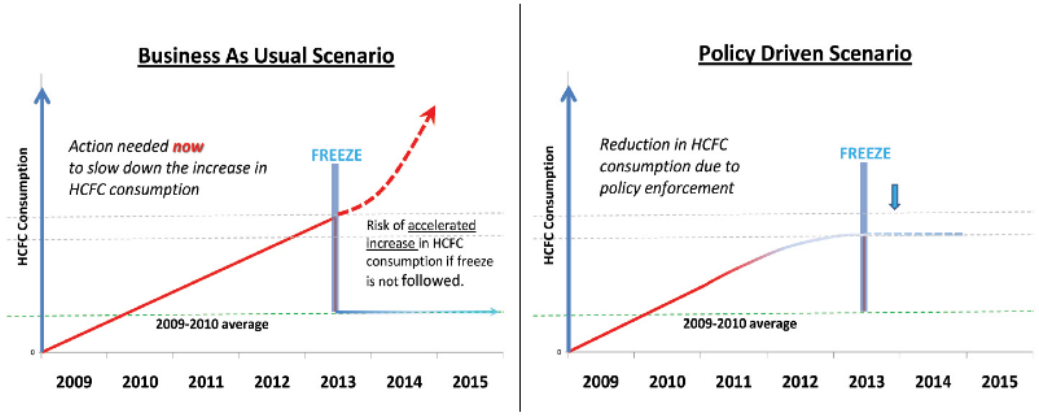
Hydrochlorofluorocarbons (HCFCs) are ozone depleting substances (ODS) controlled by the Montreal Protocol on Substances that Deplete the Ozone Layer that are widely used in refrigeration and air conditioning, foam blowing and solvent applications.

In September 2007, the Parties to the Protocol accelerated the phase-out schedule for these chemicals through Decision XIX/6. Developing countries operating under Article 5 of the Protocol (Article 5 countries) now have to freeze by 2013 their HCFC production and consumption to the average of their 2009-2010 levels, followed by a 10 percent reduction by 2015, a 35 percent by 2020, a 67.5 percent by 2025, and a 100 percent phase-out by 2030 (with 2.5 percent allowed, if necessary, for servicing existing equipment until 2040). The same decision requires developed countries to accelerate their phase-out schedule by 10 years to completely eliminate HCFCs by 2020 (with 0.5 percent allowed, if necessary, for servicing existing equipment until 2030).

Action on HCFCs is important in that these chemicals have an impact on both ozone depletion and climate change. In terms of direct impact, the most commonly-used HCFCs have ozone depleting potentials (ODPs) ranging from 0.02 (HCFC-123) to 0.11 (HCFC-141b) and global warming potentials (GWPs) ranging from 76 (HCFC-123) to 2270 (HCFC-142b). Equipment using HCFCs consumes energy, which contributes to indirect global warming impacts.

Developing countries are close to a very important step in the new accelerated HCFC phase-out; the 2013 freeze. Taking early action that would facilitate compliance, specifically the establishment of policies and legislation, is therefore critical to a successful and smooth phase down – as illustrated on the figure below.

The accelerated HCFC phase-out agreed under the Montreal Protocol presents Article 5 countries with an unprecedented opportunity to adopt new ozone and climate-friendly technologies, to improve energy efficiency, enhance employment, and thereby contribute to development of the Green Economy. The Montreal Protocol's Multilateral Fund is financially and technically supporting Article 5 countries in their transition away from HCFCs through the preparation and implementation of national HCFC Phase-out Management Plans (HPMPs) and other activities. Following the Parties' direction, the Multilateral Fund when providing this assistance, is focussing on, inter alia, substitutes and alternatives that minimize other impacts on the environment,



including on the climate, taking into account GWP, energy use and other relevant factors.

Proper policy frameworks are essential first steps on the path to meeting the new phase-out schedule and remaining in compliance with the Montreal Protocol. National Ozone Units (NOUs) should start or accelerate the process of establishing different measures – institutional, legislative and investment-oriented – to take early action to control HCFCs. There are a range of short and medium-term policy and legislative options available to do this. The UNEP DTIE OzonAction Programme has prepared this booklet to help guide NOUs in this endeavour. It is based on the experience of different countries, and the knowledge of key international experts and the OzonAction Compliance Assistance Programme (CAP) teams.

Early set-up and enforcement of policies would help in reducing the risk of accelerated increase in HCFC consumption (see figure). The dual gains for the ozone layer and climate system will be realised only if countries choose the right path, which may not be the "business as usual" technology option and which may require additional consideration by those making the decision. An impartial consideration of the relative merits of HCFC replacement technologies and chemicals, including both fluorinated and non-fluorinated (i.e. "natural") options, is essential. The policy and legislation in the country have a great deal to do with shaping the technology course taken by Article 5 countries, and National Ozone Units are the key drivers of such policies.

The HCFC phase-out presents us with an unparalleled opportunity. National Ozone Units should use policy and legislation as tools to quickly seize that opportunity to protect the ozone layer and the climate system.

Rajendra M. Shende

Note: References given for the status of legislation in certain countries as well as the web links are as of August 2009. Please double check for the latest information on these references

Table of Contents

How to use this booklet

This booklet contains different options that National Ozone Units may consider for controlling and phasing out HCFC consumption in a smooth and efficient manner. Decision makers in developing countries may decide to select one or more options for implementation, depending on the current level of HCFC consumption and its projected growth over the next few years in the absence of any measures taken.

The options are grouped into five categories related to: trade monitoring and control, restrictions on use, emission prevention, record keeping and capacity building, and are color coded for easy identification:

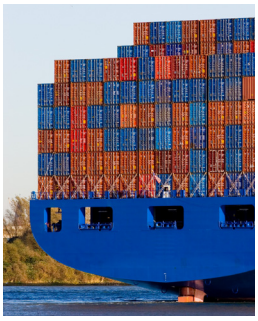
Blue: Option recommended for quick implementation
Green: Option recommended for future implementation

The options are also marked with different pictograms indicating the type of the option:

The options presented do not include the obvious substantial measure i.e. establishing a licensing system for the import and export of HCFCs (including mixtures containing HCFCs) since it is understood that all Article 5 countries should have already fulfilled that general requirement of the Montreal Protocol as a mandatory measure for countries who ratified the Montreal Amendment. This booklet also does not contain the specific enforcement-related measures such as informal Prior Informed Consent (iPIC) procedure[1], although references to iPIC are made in relation to monitoring and control of trade in HCFCs.

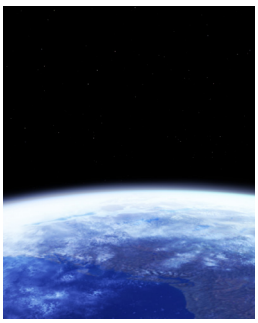
Within each chapter the various options are sub-divided into the following sections:

(1) General description
(2) Advantages / impacts / benefits
(3) Disadvantages / efforts / costs
(4) Support measures required for effective implementation
(5) Criteria to define most suitable implementation schedule
(6) Criteria for decision making to implement / not to implement
(7) Status of implementation in selected countries
(8) Links and resources



Trade monitoring and control

Restrictions on use



Emission prevention

Record keeping

Capacity building

1. UNEP DTIE prepared "**Guidelines for implementation of informal Prior Informed Consent (iPIC) procedure**" which can be found on http://www.unep.fr/ozonaction

Note about the HCFC containers, products and equipment:

As some of the proposed measures contained in this booklet concern HCFCs (substances or mixtures in containers used primarily for transportation or storage) and others concern products and equipment containing HCFCs, understanding the difference between the HCFC container and HCFC-containing products or equipment is of great importance for decision makers. The "rule of thumb" based on Decisions I/12A and XIV/7 of the Parties to the Montreal Protocol is that the HCFC container may be considered "product or equipment" containing HCFC only if "dispensing from the container constitutes the intended use, so the container is part of the use system" and this rule applies no matter which customs code has been assigned to the goods in question[2]. This "rule of thumb" is illustrated in the images below. It is also important that Decision I/12A makes it very clear that container size cannot be taken as a basis for judgment, i.e. even if the HCFC is marketed in a very small container, it is still to be considered a container, not a product containing HCFC, if the condition specified above has not been met.

Examples of containers used for transportation and storage

image courtesy of Hennecke GmbH

Examples of products and equipment

Exemption from this rule are containers with polyol blends containing HCFCs used as components for polyurethane (PUR) foams that would be considered "products containing HCFCs"

Further information on HCFC phase-out is available from UNEP DTIE's HCFC Help Centre: http://www.unep.fr/ozonaction/topics/hcfc.asp.

2. An exemption from this rule is containers with polyol blends containing HCFCs used as components for polyurethane (PUR) foams which are considered to be "products containing HCFCs"

Options related to monitoring and control of trade

Import quotas for HCFCs

1. General description

Most countries have import quotas already in place for CFCs. Establishing import quotas for HCFCs would mean in practical terms:

• specifying the maximum quantity of HCFCs that may be imported each year by the country (based on the limits set by the Montreal Protocol or the country's policy, if more advanced). For Article 5 countries, the first HCFC consumption control measure will be the freeze in 2013 and the next - a 10% reduction in 2015.

This quantity (the country's annual limit) may be part of the relevant national legislation concerning ODS and is usually expressed in ODP tonnes[3].

• selecting the importers who will be entitled for the annual import quotas and establishing the rules which would govern the splitting of country's limit to particular importers.

The "first come, first served" approach should be avoided and the selection of importers made on the basis of their historical share in the country's total imports of HCFCs (and possibly also CFCs) over a specified period of time. For example the 2005-2007 period could be selected as it covers the last three years prior to the establishment of the new phase-out schedule under the Montreal Protocol. The reason for taking such an approach is that (1) this approach is based on transparent criteria and (2) phasing out HCFCs (and earlier, CFCs) would mean losing money (or even total collapse) for certain companies that built their business on HCFC trade (or previously, CFC trade). Taking this into account it becomes obvious that allowing new importers to compete with the "old" ones on a "free market" basis would not be a fair approach. However, new importers could be allowed to enter such quota system in case the "old" importers transfer their rights to them or declare that part of the quota they received would not be used. In the latter case both new and "old" importers should be allowed to compete for the remaining quotas.

• deciding on how the quotas can be used by the importers during the year

Using of the HCFC quotas by importers may be accomplished by either allowing the importers to use their quotas throughout the year or establishing a permit system (the recommended option). The permits may be given for a specified period of time, e.g. three months or six months, allowing for more than one shipment during the permit validity period to be made, or given for each shipment (for details of that latter option – see "Permits for each HCFC shipment" option on page 13). If permits allow for multiple shipments, special requirements for customs are necessary so that each quantity imported as a separate shipment is marked by the customs officer on the original permit document and thus subtracted from the total quantity specified in the permit. The import consignment receipt in the entry port has to happen within the calendar year the relevant quota was assigned for.

2. Advantages / impacts / benefits

The advantage of establishing an HCFC import quota system is that it guarantees that the import limits set up by the Montreal Protocol (or the country, if its controls are more advanced than the Montreal Protocol's phase-out schedule) would not be exceeded and that

3. ODP tonnes are metric tonnes multiplied by ODP (ozone depleting potential) assigned for each ODS in the Montreal Protocol

the HCFC use in the country may be quantitatively controlled. Therefore, the benefit would be avoiding the possibility of entering into non-compliance with the Montreal Protocol. In case the selection of importers is made on the basis described under item 1 above, there will also be clear benefit for the selected importers who will be safeguarded in doing their business, being certain of the HCFC quotas that have been assigned to them. Obviously, this means restrictions in free trade of HCFCs, but it should be understood that this is a necessity to implement trade-related environmental agreements such as the Montreal Protocol.

3. Disadvantages / efforts / costs

There is no disadvantage of establishing the HCFC quota system envisaged and therefore most of the Parties to the Montreal Protocol have decided to introduce such systems. The effort required is not great – based on the relevant legislation, the competent authority has to operate the system, which includes, for example, making the list of eligible importers, calculating the quotas for particular importers from the list, publishing the quotas and – if a permit system is established – issuing the permits. The cost involved in operating such system would be part of the general cost of the competent authority (e.g. the Ministry of Environment) and thus would be included in the country's annual budget. Usually, one person in the existing National Ozone Unit is assigned to perform that work.

4. Support measures required for effective implementation

A survey of importers that imported HCFCs (and CFCs) in the past will facilitate making the list of eligible importers. Establishing Informal Prior Informed Consent (iPIC) procedure with the HCFC exporting countries will help to track the country's quota. Training of customs officers and importers will be a useful support measure that may assist in effective implementation of quota system.

5. Criteria to define most suitable implementation schedule

This is one of the options which should be implemented as early as possible if the country decided to establish it based on the criteria described under item 6 below. Establishing the quota system for HCFCs may be part of the HCFC Phase-out Management Plan (HPMP) agreed by the country or may be implemented as a separate measure.

6. Criteria for decision making to implement / not to implement

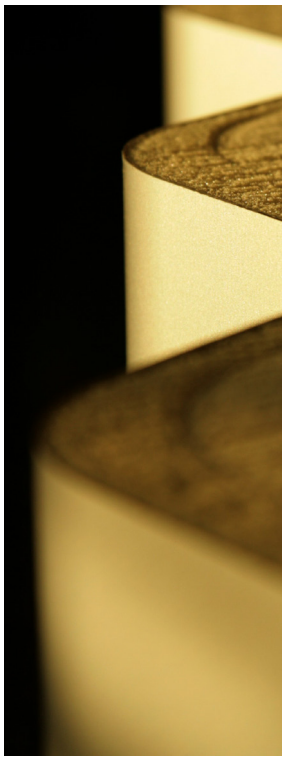
The main criterion should be the dynamics of increase in HCFC imports over the last few years. If that increase is significant, then the establishment of an HCFC quota system will be crucial for controlling HCFC trade in order to comply with the 2013 freeze and further phase-down steps.

7. Status of implementation in selected countries

The European Union (EU) has a well established system of import quotas for HCFCs. The importers are selected based on their share of total production of HCFCs and imports of HCFCs from outside the 27 EU countries in the past. Starting from 1 January 2010, imports of HCFCs will be allowed only for exempted uses (laboratory and analytical, feedstock, process agents) - for which the quotas will be established, and for destruction - for which there will be no quotas. The United States has developed a system of allowances for HCFC importers which exclude imports for certain banned uses.

8. Links and resources

- Information on the EU HCFC quota system is available on http://ec.europa.eu/environment/ozone/ods/
- Information on USA allowances for HCFCs is available on http://www.epa.gov/ozone/strathome.html
- Information on iPIC procedure can be found in "Guidelines for implementation of informal Prior Informed Consent procedure" available on http://www.unep.fr/ozonaction/topics/hcfc.asp



Mandatory reporting by HCFC importers and exporters

1. General description

Mandatory reporting by importers and exporters is a very important requirement to be included in any import/export licensing system since without such a provision, monitoring of the actual use of the licenses or permits issued is very difficult. Some countries believe that relying on customs data is sufficient and that there is no need to produce an additional set of import/export data. However, those who are experienced in operating import/export licensing systems know that customs data alone cannot be relied upon to provide an accurate picture of the imports and exports. This is because the data provided by customs agencies are based on customs codes that are not specific enough in the case of ozone depleting substances (and in particular, in the case of HCFCs) to be used as the main source of information on imports and exports. Specifically, customs data do not allow differentiation between the imported or exported quantities of individual HCFCs or individual mixtures containing HCFCs, both of which are needed to calculate the country's annual consumption of HCFCs for the purpose of reporting data to the Ozone Secretariat[4], and verification of the country's compliance with the Montreal Protocol phase-out schedule or country's own more advanced phase-out targets.

Several steps are required to ensure that a reporting system is structured and managed to supply the competent authority with reliable data on actual HCFCs import and exports.

The first step is to ensure that what is to be reported is not only the total quantity of each individual HCFC and HCFC-containing mixture imported or exported annually, but also additional information including, *inter alia*, dates of particular shipments, countries of origin or destination and names of actual exporters and importers in the third countries. This additional information will allow the authority that operates the licensing system to compare the data received from importers and exporters with data supplied by customs, and if any discrepancy is found, to clarify it with the relevant stakeholders.

The second step is to set a deadline for supplying the data reports – the 28th February is usually selected by the competent authority - and to establish penalties for non-reporting or late reporting. Specifically, non-reporting for the previous year (or reporting intentionally wrong data) should exclude the importer or exporter from the list of importers/exporters in the following year.

2. Advantages / impacts / benefits

The advantage of mandatory reporting by HCFCs importers and exporters is to have a set of data on HCFCs quantities actually brought into the country or sent out from the country, in addition to the set of general data provided by customs. The benefit is that more reliable data may be produced by comparison of information received from those two sources, and this would have positive impact on the quality of data reported by the country to the Ozone Secretariat. Another important advantage is that the competent authority will be able to cross-check the agreement of quantities reported by individual importers/exporters with the quantities specified in the relevant licenses or permits. If the system is set up such that some additional data are also reported (see item 1 above), then an additional benefit will be the opportunity for verifying the single shipments if necessary for the purpose of investigations of alleged illegal trade activities. For legitimate importers and exporters, the addi-

4. HCFC-containing mixtures have already been assigned specific code in Harmonized System (HS) which is 3824 74. Proposal for new classification of HCFCs under HS has been made to the World Customs Organization (WCO) in 2008, so – if it receives final approval of WCO - it can be expected that starting from 1 January 2012 five most commonly used HCFCs will be assigned their individual HS codes.

tional value of establishing such a reporting system is that it would enable competitors who operate illegally in the import/export market to be identified, since further investigation of discrepancies between data provided by importers/exporters and by customs may lead to discovery of illegal shipments.

3. Disadvantages / efforts / costs

Setting up a system for reporting by importers and exporters will mean additional administrative work for the competent authority that operates the licensing system, but it is worth the effort put into it, taking into account inevitable advantages – see item 2 above. It also means additional administrative burden for importers and exporters, but they will not object if they are made to understand that the system will benefit them as well.

4. Support measures required for effective implementation

Support measures required include establishing the list of eligible importers and exporters each year and drafting the reporting requirements, including the reporting forms. As indicated under item 2, such reporting requirements could be extended to include the obligation to provide certain supplementary information in addition to the basic information on quantities imported or exported annually. The legislation should also contain penalties for non-reporting or late reporting. Taking into account the complexity of the reporting, organizing a short (maximum half-day) training course for importers and exporters would be a very useful support measure to show examples of good reports and explain the benefits of mandatory reporting.

5. Criteria to define most suitable implementation schedule

Mandatory reporting by importers and exporters is a measure without which a country's HCFCs import/export licensing system will not work effectively, so it is recommended for all countries.

6. Criteria for decision making to implement / not to implement

The decision should then be not whether to implement mandatory reporting or not, but whether to require additional information to be provided with the reports. Here the criterion should be whether the country really wishes to prevent illegal trade in HCFCs or not.

7. Status of implementation in selected countries

In the European Union, all importers and exporters report to the European Commission providing not only imported or exported quantities of each HCFC (including HCFCs contained in mixtures), specifying separately imported/exported quantities of used HCFCs, but also the quantities remaining as stocks. Used import licenses stamped by customs are returned to the Commission by a specified deadline. From 1 January 2010 imports of HCFCs are possible only for exempted uses (laboratory and analytical, feedstock, process agents) and for destruction, and it is planned to extend the information required from importers and exporters, so it will be clear for what purpose the imported quantities were actually applied. Most of the other non-Article 5 countries have mandatory reporting by HCFC importers and exporters in place (in the United States reporting for each quarter is required) while in Article 5 countries this requirement is being successively implemented.

8. Links and resources

- EC reporting requirements for HCFC imports/exports available on: http://ec.europa.eu/environment/ozone/ods.htm
- USEPA reporting requirements for HCFC imports/exports are available on: http://www.epa.gov/ozone/record/index.html

Special requirements for labeling of HCFC containers

1. General description

Specific labeling of containers of ozone depleting substances (ODS) is a measure that allows customs, environmental inspectors or ODS dealers and users to make a quick, preliminary identification of the contents of ODS shipments. The careful design of the label is therefore a very important element of any ODS legislation. The international community is making continuing efforts to standardize the labels for particular groups of chemicals, including ODS. Information that should be placed on ODS containers, and specifically on HCFC containers, should include at least the following elements: chemical name, chemical formula and trade name of the substance, ASHRAE designation (for refrigerants), CAS number or UN number, producer's name and address and batch number. For mixtures, the composition by percentage weight (wt %) should also be specified on the label.

Labeling by itself is not enough if a customs officer, inspector or dealer needs a detailed identification of the contents of a shipment. Detailed information requires examining not only the documentation that accompanies HCFC shipment (e.g. the producer's leaflets and data sheets or/and customs documents), but in some cases also identifying the chemical composition using portable refrigerant identifiers or using laboratory-based analysis (such as infrared spectroscopy or gas chromatography). Information as to whether the HCFC is virgin (i.e. unused or newly produced), recycled or reclaimed is also very important. If the shipment is intended for laboratory or analytical uses, then information on its purity must be shown on the label.

It is useful if the importing country decides to require that labels are made in the local language, and if possible also in one of the UN languages so that customs officers and users may quickly recognize the contents of the shipment. The same requirement may also apply to technical data sheets and instruction manuals (if any).

2. Advantages / impacts / benefits

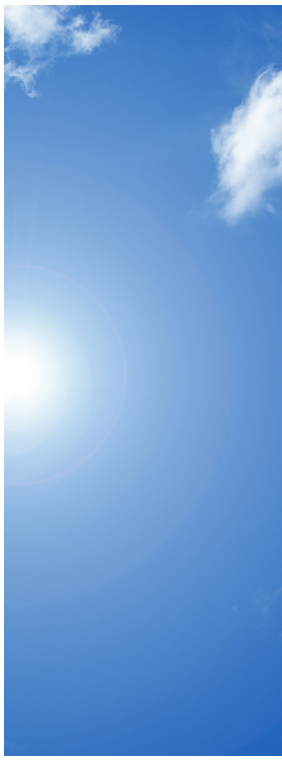
The main advantages of labeling is that it allows for the first quick identification of the substance and, if relevant legislation is appropriately drafted, it may also allow for the identification of the producer and country of origin that sometimes may be very useful in assessing the risk of illegal HCFC trade.

3. Disadvantages / efforts / costs

The major disadvantage of labeling is that it means an additional administrative burden for the producers, importers and exporters and probably that was the reason why the Parties to the Montreal Protocol could not agree on a common globally-accepted labeling system for ODS. The World Customs Organization's GHS (Globally Harmonized System of Classification and Labeling of Chemicals) also has not published any specific pictogram indicating that the substance depletes the ozone layer, though this is expected soon.

4. Support measures required for effective implementation

An essential support measure that would assist in the implementation of labeling requirements of HCFC containers is the requirement for the proof of origin (described in "Requirement for proof of origin for HCFC shipments" option – see page 15). Without that particular requirement, labeling itself may not be enough to avoid illegal trade since labels can be easily replaced with false ones, while proof of origin is a signed document that can be easily checked for authenticity with the entity which issued it. Another very useful support



measure is to extend labeling provisions for HCFCs containers and the requirement for proof of origin to HFCs containers. This will help to prevent mislabeling of HCFC containers (which are controlled under the Montreal Protocol) as containing HFCs (which are not controlled under the Montreal Protocol).

5. Criteria to define most suitable implementation schedule

There is no specific time schedule recommended for implementing labeling provisions, but the sooner there is one the better, taking into account the advantages of having such provisions in place – see item 2.

6. Criteria for decision making to implement / not to implement

The main criterion for deciding whether or not to implement detailed labeling requirements is the willingness of the country to prevent illegal HCFC trade.

7. Status of implementation in selected countries

In the European Union there are presently no specific requirements for labeling of HCFC containers, though from 2009 they must be labeled according to Regulation (EU) 1272/2008 where it is required that the label contains the following phrase: "Hazardous to the ozone layer". However, in the new recast ODS regulation, specific labeling of containers with substances (including HCFCs) has been applied to exempted uses that are allowed from 1 January 2010 (laboratory and analytical uses, process agent uses and feedstock uses), so it will be clear for which use the particular container is shipped. Regulation (EC) 842/2006 that deals with F-gases already contains labeling requirements, and the Commission Regulation 1494/2007 specifies how the label should look. It is important to know that those provisions are contained in the articles which are based on article 95 of the EU Treaty, i.e. the Member States are not allowed to extend the labeling requirements in their national legislations.

Other major HCFC exporting countries (United States, China, India) do not have such labeling systems in place, though in India it is quite developed and strict controls have been applied to exports. China has a specific label to be placed on containers with recycled HCFCs (in this case meaning both recycled and reclaimed). HCFC importing Article 5 countries usually do not have strict labeling requirements for HCFC containers though in some cases they do exist (e.g. Macedonia, Turkey).

8. Links and resources

- Globally Harmonized System of Classification and Labeling of Chemicals, second revised edition, July 2007 – available on http://www.unece.org/trans/danger/publi/ghs.
- Regulation (EC) 1272/2008 of the EP and the Council of 16.12.2008 on classification, labeling and packaging of substances and mixtures, amending and replacing Directives 67/548/EEC and 1999/45/EC and amending Regulation 1907/2006 (OJ L 353 of 31.12.2008)
- Regulation (EC) 842/2006 of the EP and the Council of 17 May 2006 on certain fluorinated greenhouse gases (OJ L 161 0f 14.06.2006)[5] .
- Commission Regulation 1494/2007 of 17.12.2007 establishing, pursuant to Regulation (EC) No 842/2006 of the EP and the Council the form of labels and additional labeling requirements as regards products and equipment containing certain fluorinated greenhouse gases.
- Government of India, Ministry of Environment and Forests Notification of 17 July 2000 – available on http://www.envfor.nic/in/legis/ods/odsrcr.html
- EP OzonAction "Refrigerant blends containing HCFCs" - www.unep.fr/ozonaction/topics/hcfcblends.htm
- UNEP OzonAction "Trade Names of ODS and their Alternatives" http://www.unep.fr/ozonaction/information/tradenames/main.asp

5. All EU regulations are available on http://eur-lex.europa.eu

Ban on non-refillable HCFC containers

1. General description

The term "non-refillable container" means a container that was originally designed not to be refilled (these are also sometimes referred to as "disposable cylinders"). In countries where the major use of HCFCs is for refrigeration and air conditioning, non-refillable containers dominate the market since importers prefer to import small "ready to use" containers instead of much bigger bulk containers that have to be emptied into smaller containers and then returned to the producer. One problem with non-refillable containers is that criminals also prefer them because it is much easier to counterfeit small cylinders rather than big tanks, and their size makes them easier to smuggle.

When a ban on placing on the market of non-refillable containers is included in a country's legislation, it is very important both for the enforcement services (e.g. customs or environmental inspectors) and the HCFC dealers and users to differentiate between non-refillable containers and refillable containers. However, that differentiation is not always easy. One way to do it is by weight: the non-refillable containers containing HCFCs (which are gases) are usually lighter than the refillable ones, their construction is less substantial and there is always only one valve whereas larger refillable cylinders may sometimes contain two valves. The typical capacity of such non-refillable containers is 13.6 kgs of HCFC refrigerant, though much smaller containers having capacity of 1 kg or less may also be used. The pictures on the right show the most typical non-refillable and refillable cylinders used for transportation or storage of ODS refrigerants, including HCFCs.

Refillable cylinders each holding 25 kg of HCFC-22

Refillable ISO tanks each holding about 30 tonnes of HCFC-22

Non-refillable cylinder holding 13.6 kg of an HCFC – containing blend

Non-refillable cylinder holding about 1 kg of a CFC-12 – replacement refrigerant blend

2. Advantages / impacts / benefits

A ban on the placing on the market of non-refillable HCFC containers is one measure that can assist in a faster phase-out of HCFCs, because without such containers, the illegal trade that leads to sustaining the demand for HCFCs would be considerably more difficult. From an environmental perspective, another benefit of including a ban on non-refillable containers in a country's legislation is that there will be no more emissions to the atmosphere of the HCFCs remaining in used non-refillable containers.

3. Disadvantages / efforts / costs

There are no clear disadvantages to such an approach, except for the additional effort and cost of dealers and servicing companies to re-package HCFCs from big tanks into smaller refillable containers and to ensure these are returned after use. However, the cost for the HCFC users should not increase because the price of specific HCFC imported in small non-refillable containers should always be much higher than the price of the same substance imported in large tanks (i.e. quantities of scale). There may be an initial outlay in the form of a returnable deposit on the refillable containers to be borne by the users.

4. Support measures required for effective implementation

Since a ban on non-refillable containers means that importers and dealers must be directly involved in re-packaging the HCFCs from big tanks into small refillable containers, their personnel involved in those activities must be appropriately trained. Implementation of clearly drafted labeling requirements (see "Special requirements for labeling of HCFC containers" chart on page 5.) for HCFC containers may also be considered. Still another useful support measure is to extend the ban to non-refillable HFC containers (which should effectively close the possibility of the illegal trade in selling non-refillable cylinders containing CFCs or HCFCs and mislabeled as HFCs).

5. Criteria to define the most suitable implementation schedule

The implementation of this option may be timed to match the start of restrictions on HCFCs under the Montreal Protocol, i.e. 2013, though earlier implementation will help prevent illegal trade and facilitate the HCFC phase-out in the future.

6. Criteria for decision making to implement / not to implement

The main criterion for deciding whether or not to implement such a ban is the motivation of the country to use all possible measures to prevent illegal trade and avoid HCFC emissions.

7. Status of implementation in selected countries

Only few countries have a ban in place on non-refillable HCFC or HFC containers; these include Australia, Canada and the European Union. India has established strict regulations on pressurized gas cylinders that allow for seizure of non-refillable cylinders under the Explosives Act containing HCFCs by the customs if the requirements prescribed by that legislation are not met.

8. Links and resources

- Australian legislation on ODS is available on http://www.comlaw.gov.au/Comlaw/Legislation/
- Canadian legislation on ODS is available on http://www.ec.gc.ca/ceparegistry/documents/regs/g2-13718_r1.pdf
- A Consolidated version of EU Regulation (EU) 2037/2000 on ODS is available on http://eur-lex.europa.eu.
  Regulation 2037/2000 is planned to be replaced with the recast regulation on ODS starting from 1 January 2010
- Indian Gas Cylinder Rules, 1981 - available on http://www.explosives.nic.in/gascylinder.htm

Restrictions on imports / placing on the market of products and equipment containing or relying on HCFC

1. General description

The Montreal Protocol only addresses ODS, not products or equipment containing such substances or relying on them. The only provision of the Protocol that addresses products or equipment is the ban on imports of products and equipment[6] containing CFCs and halons from non-Parties. However, the option for countries that do not want products or equipment containing particular ODS to enter their territory is to request the Ozone Secretariat to include them on the list of such countries, that is available on the Ozone Secretariat's website (see item 8 below). Nevertheless, a country may want to consider establishing restrictions on imports/placing on the market of products and equipment containing (or relying on) certain ODS (in this case HCFCs). Such a measure would facilitate diminishing the demand for HCFCs. There are three choices that must be made to establish such a control.

The first choice to make is whether the competent authority wishes to limit the restrictions to products and equipment actually containing HCFCs, or if it wishes also cover products and equipment relying on HCFCs ("relying on" being understood as "not able to function without HCFCs"). Selecting the second option has certain practical consequences, but it is recommended since only with that option in place can the flow of unwanted, obsolete HCFC equipment into a country be stopped.

The second choice to make is whether the competent authority wishes to restrict only imports alone, or imports and placing on the market. The term "placing on the market" may be understood differently in different countries, so clear definition of "placing on the market" must accompany any provision related to that term. For countries that manufacture HCFC-containing products or equipment, the choice must be that either no restrictions are introduced, or both imports and placing on the market (or placing on the market for the first time) are covered by the restrictions, since otherwise basic international trade rules would be broken.

The third choice to make is whether the competent authority wishes to impose a ban on imports/ placing on the market of products and equipment containing HCFCs or only to extend the licensing system for HCFCs to also cover products and equipment containing (or possibly also relying on) HCFCs.

Since there may be several different approaches to the issue of restricting the trade in products and equipment containing/relying on HCFCs, only advantages and disadvantages of the following selected options will be presented under items 2 and 3, respectively:

Option A: Licensing of imports of products and equipment containing / relying on HCFCs.

Option B: Ban on imports and placing on the market of products and equipment containing/ relying on HCFCs.

2. Advantages / impacts / benefits

Option A: The advantage of this option (licensing) is that it is not as drastic as the use bans on HCFCs – see "Specific phase-out sched-

6. As officially defined, the Montreal Protocol term "products" also includes "equipment", though in several decisions of the Parties the term "products and equipment" is used.

ules and use bans for HCFCs" option on page 24, but at the same time it allows the competent authority to monitor and control the flow of products and equipment containing/relying on HCFCs and, if necessary, regulate it by limiting the number of units of equipment or weight of products that would be permitted to enter the country.

Option B: The advantage of this option is its transparency and simplicity as compared to licensing – no management of a licensing system is necessary.

3. Disadvantages / efforts / costs

Option A: The disadvantage of this option is that it requires careful design of the licensing system and imposes additional administrative burden on the competent authority and enforcement bodies (customs, environmental inspectors). It should be added that based on customs codes only products and equipment which actually contain or rely on HCFCs cannot be identified.

Option B: The disadvantage of this option is that it is very restrictive and has to be introduced step-by-step – see item 5 below.

4. Support measures required for effective implementation

A support measure required to assist in implementing any of these options is establishing a list of such products and equipment that may contain or rely on HCFCs. However, producing such a list is very difficult and has not been included so far in the Montreal Protocol.

5. Criteria to define most suitable implementation schedule

Option A: If this option is chosen, it has to be designed and introduced as quickly as possible.

Option B: If this option is chosen, it would also be very useful to start as soon as possible, but to take a step-by-step approach, i.e. to gradually introduce bans covering more types of products and equipment in each step or introduce a total ban with certain exemptions that will be later gradually eliminated later.

6. Criteria for decision making to implement / not to implement

Countries may wish to select Option A (licensing) first and transition to Option B (bans) later when the process of the HCFC phase-out is more advanced.

7. Status of implementation in selected countries

In the present European Union ODS regulation (2037/2000), the import and placing on the market of products and equipment containing HCFCs is banned with some exemptions. In the new recast regulation on ODS that entered into force on 1 January 2010, this ban has been extended to cover products and equipment relying on HCFCs. In the United States the ban on products and equipment containing HCFC-141b was introduced in 2003 and the ban on products and equipment containing HCFC-22 and HCFC-142b was in place on 1 January 2010. Certain developing countries (e.g. India) decided to license imports of products and equipment containing HCFCs.

8. Links and Resources

- Regulation (EC) No 2037/2000 (EC) of the European Parliament and of the Council of 29 June 2000 on substances that deplete the ozone layer (OJ L 244, 29.9.2000), as last amended[7]
- USA legislation concerning HCFCs available on: http://www.epa.gov/ozone/strathome.html
- Government of India, Ministry of Environment and Forests Notification of 17 July 2000 – available on http://www.envfor.nic/in/legis/ods/odsrcr.html
- List of Parties who do not wish to import products or / and equipment containing/relying on ODS – see www.ozone.unep.org

7. Consolidated version of Regulation (EU) 2037/2000 is available on http://eur-lex.europa.eu. Regulation 2037/2000 is planned to be replaced with the recast regulation on ODS from 1 January 2010

Permits for HCFC transit

1. General description

A significant portion of illegal ODS shipments occurs because of the lack of control of goods moving from one country to another through a third transit country. Such trade also takes place in duty free zones or free trade zones, which can be considered to be a specific form of transit. The main reason that these transit hubs attract illegal activity is that goods in transit do not undergo the standard customs procedure of "release for free circulation", and therefore they usually remain outside of customs control. In this case criminal elements may redirect, mislabel, or otherwise falsify the shipments.

Permits for ODS in transit are an important means to combat illegal trade in ODS in these circumstances. The usefulness of permits for transit has been proven to help reduce illegal CFC trade, therefore it is logical that they may be equally useful to address illegal HCFC trade.

In practical terms, permits for HCFCs in transit work as follows:

• An application for a permit for transit would have to be sent to the competent authority in the transit country using a request format similar to that used in the case of regular imports to or exports from that particular country.
• Then, after the transit country authorities the issue of the permit, each HCFC shipment entering the transit country would have to pass through regular customs control with a clear description of the kind of substances shipped and their final destination.

The permit for transit would have to be presented to customs on the border not only when the shipment enters the country, but also when it leaves the country. It is important to note that the transit permits – similarly to import permits (see "Import quotas for HCFCs" option on page 1.) must be utilized within the calendar year they were issued. Moreover, permits approval and the compliance by users need to be independently certified in order to avoid potential misuse.

Apart from the recommendations contained in the ODS Tracking Study and Decision XIX/12 of the Parties (which lists permits for transit as a possible measure that Parties could voluntarily apply –see link below), the Parties to the Montreal Protocol have not issued any specific recommendation that permitting systems for ODS in transit should be adopted. Despite this, some countries have taken steps to control ODS in transit. For example, a few countries already have included controls of ODS in transit in their ODS legislation (see item 7 below). Other countries have general customs legislation that allows for customs to check goods without needing to have a special permit system established. However, the customs agencies of the great majority of countries do not have a legal basis for controlling this transit trade.

2. Advantages / impacts / benefits

The advantage of establishing permits for HCFCs in transit is that the introduction of such a measure can diminish the risk of illegal HCFC trade and thereby help achieve a smooth HCFC phase-out. However, it may have a negative impact on trade between the transit country and countries that export HCFCs or countries of final destination of HCFCs both of which may not be happy to see that their shipments are controlled during transit.

3. Disadvantages / efforts / costs

A disadvantage of requiring permits for transit is the potential increase in administrative burden for both the competent authority that issues the permits and the customs agency. In countries where several different types of legislation need to be modified to establish the authority for permitting of ODS in transit (e.g. if a country must amend not only its main ODS control law, but also its customs law or other major acts), then a significant effort may be required by the National Ozone Unit/government to adjust multiple existing laws at the same time.

4. Support measures required for effective implementation

Customs officers will require additional training to understand and implement the relevant provisions of the permitting system for HCFCs in transit – see also "Training of customs and environmental officers" option on page 37. Relevant training for importers and exporters may also be considered as that is a useful support measure whenever the new regulations regarding imports and exports are to be established.

5. Criteria to define most suitable implementation schedule

Implementing transit permits may not be an easy task and will probably require a longer time than implementing other options. The reason is the need to substantially amend not only the legislation dealing with ODS, but also the Customs Law. Therefore while not the first priority, in certain countries this option may have value from the point of view of controlling the trade in HCFCs.

6. Criteria for decision making to implement / not to implement

The major criterion for deciding on whether to implement a permit system for HCFCs in transit is whether the country is actually a major transit country for HCFCs or not since large numbers of transit shipments may facilitate illegal trade under the transit cover. If the risk of illegal trade in HCFCs that may be connected with transit shipments is low, the potential increase in administrative burden may not be worth the effort needed to implement permits for transit.

7. Status of implementation in selected countries

Examples of countries which have already implemented transit permits are Albania, Armenia, Kyrgyzstan, Moldova, Turkey and Uzbekistan. It is anticipated that that the permitting system they have in place contributes effectively to the prevention of illegal trade in the Europe and Central Asia (ECA) region.

8. Links and resources

- "Feasibility study on developing a system for monitoring the transboundary movement of controlled ODS between the Parties": www.ozone.unep.org.Meeting-Documents/mop/18mop/
- "Lost in Transit" – EIA brochure: www.eia-international.org

Permits for each HCFC shipment

1. General description

An effective way to closely control HCFC imports is to use a "shipment-specific" permit approach under which permits are issued for each HCFC shipment arriving into the country. In practical terms, this is just an extension of the basic HCFC quota system described in "Import quotas for HCFCs" option – see page 1, since all of the elements of that system would usually be retained. The only difference is that instead of issuing an import license denoting a specific quantity that the importer is allowed to bring to the country in a specified period of time, the authority that operates the licensing system would issue a "shipment-specific" permit that specifies the quantity which the importer is allowed to bring into the country as a single shipment. This difference makes the licensing system tighter, i.e. protection from illegal activities would be better.

Usually the quota system is retained, so the importer knows in advance what would be his/her maximum limit of HCFCs in a given calendar year. However, a modification of "shipment-specific" permit system described above could be that no quotas are assigned to the importers in advance and each application for import permit is considered separately. If such an approach is taken, it is recommended that the list of eligible importers is established anyway based on their imports in the previous years. An obvious problem that may be faced by the competent authority responsible for assigning import quotas to importers is that the total country limit for HCFCs may be exhausted after only a few months, so that no further applications for permits will be accepted in a given calendar year. This may lead to problems from importers whose applications had been rejected.

A simplified system for issuing import permits where no quotas are assigned to importers, or no list of eligible importers is even established, can be implemented only at the time when HCFCs phase-out has been completed and HCFCs will be allowed to be imported without quantitative limits. In this case imports would only be allowed for destruction or for the uses exempted by the Montreal Protocol (feedstock, process agents, laboratory and analytical essential uses). Nevertheless, even in such a situation, it is recommended that the importers who wish to import in a given calendar year are registered in advance by the fixed date.

The "shipment-specific" permit system can also be effectively used for controlling exports of HCFCs. In this case, establishing export quotas does not make sense since exports are not limited by the Montreal Protocol, but it is recommended that the exporters are registered in advance.

2. Advantages / impacts / benefits

The main advantages of issuing permits for each HCFC shipment are:

- Avoiding import of more HCFC than permitted by re-using the same import license document that specifies the total quantity which may be imported over a given period of time - if the customs officer does not make a relevant note on the quantity brought in an earlier shipment that has already been executed based on the same document. This advantage is very important for the countries that are concerned that the actual quantity of HCFC imports may exceed the their HCFCs consumption limit set by the Montreal Protocol provisions or by the country's own more ambitious phase-out schedule.
- Allowing for stricter control of the flow of HCFCs into the country for particular types of uses – in a "shipment-specific" permit system, it may be required to specify the intended use of the ODS in each permit, which is more diffi-

cult to do in a standard quota system where licenses are given for a given quantity to be imported in a specified period of time. Therefore a "shipment-specific" system would be ideal for those countries who wish to phase-out HCFCs on substance-by-substance or use-by-use manner – see "Specific phase-out schedules and use bans for HCFCs" option on page 24.

3. Disadvantages / efforts / costs

The major disadvantage of requiring permits for each shipment is the apparent increase in administrative burden of the competent authority that issues such permits, specifically in countries where the number of eligible importers is high and the imported quantities of HCFCs are high. There is also an increase in the workload of the importers and exporters who need to apply for permits. For this reason, some countries have decided not to implement such a system, at least at the present time when the phase-out schedules for HCFCs are still not very demanding and the total phase-out date is far away.

4. Support measures required for effective implementation

The same support measures as those recommended for import quota systems described in "Import quotas for HCFCs" option – see page 1. are needed to implement a permitting system for each shipment. In particular establishing informal Informed Prior Consent (iPIC) procedure with exporting countries may be very useful, so that any permit will be based on confirmation from the exporting country. By combining these different approaches, the countries can help eliminate any illegal trade resulting from falsified applications for permits.

5. Criteria to define most suitable implementation schedule

Once the country decides to establish a system for issuing permits for each HCFC shipment, the implementation schedule will depend on the country's level of ambition with regard to controlling HCFCs. In principle, two possible dates may be recommended for consideration:

- 1 January 2011 – if the country wishes to start stricter control of HCFCs imports already in the beginning of the 2011-2012 period preceding the 2013 freeze, so it will be much easier to achieve the freeze or a more ambitious goal, if any.
- 1 January 2013 – if the country just wishes to ensure that the freeze limit or a more ambitious goal set up individually is followed.

6. Criteria for decision making to implement / not to implement

The main criterion for deciding whether or not to implement a system for issuing permits for each HCFC shipment is whether the country plans just to follow the Montreal Protocol deadlines, or whether it has more ambitious plans to set country-specific HCFCs phase-out dates that are ahead of those deadlines. Another criterion is whether the phase-out dates for specific HCFCs or for specific HCFC uses have been established or if they are planned to be established. If the answer is "Yes", introducing permits for each HCFC shipment is highly recommended.

7. Status of implementation in the selected countries

This measure has been be implemented in the European Union (EU) starting from 1 January 2010 for all HCFC shipments, but it should be noted that it in the EU imports of HCFCs are only allowed for destruction or for uses exempted by the Montreal Protocol, so number of shipments would not be very high. Examples of some Article 5 countries which have requirement for permits for each HCFCs shipment included in their legislations are: Bosnia and Herzegovina, Former Yugoslav Republic of Macedonia and Turkey.

8. Links and resources

- Information on the iPIC procedure can be found in "Guidelines for implementation of informal Prior Informed Consent procedure" – available on http://www.unep.fr/ozonaction

Requirement for proof of origin for HCFC shipments

1. General description

"Proof of origin" issued for the shipment of a particular substance, in this case an HCFC, should be understood to mean an official document signed by the producer of the substance confirming that the shipped substance was produced by that company. It may also specify the batch number(s), date(s) of production and substantial properties, e.g. purity. The "proof of origin" document accompanies the physical shipment, so the customs officer may examine it as part of clearance procedure.

If a country decides to include a requirement for "proof of origin" in its ODS control legislation, the legislation should specify the language in which the "proof of origin" documents should be written, what information they should contain and who is supposed to sign the relevant documents. The legislation may also require that the "proof of origin" document be signed by the importer or exporter, but it is recommended that the document be considered valid only if it has been signed by the producer.

It would be especially useful to require such a "proof of origin" for shipments of used HCFCs, since the consumption of recycled or reclaimed ODS is exempted from Montreal Protocol phase-out schedules provided that the traded quantities are reported under Article 7[8]. According to the Montreal Protocol "recycled" ODS are those ODS recovered from products or equipment which were only roughly cleaned, usually by the service technicians who carried out the recovery, while "reclaimed" ODS are those ODS recovered from the products or equipment which are cleaned to meet specified standard of performance. Usually such thorough cleaning is done in a facility where distillation processes are carried out.

In this respect, it is recommended that only "reclaimed" HCFCs are allowed to be imported since it would not be possible to produce "proof of origin" for a shipment of recycled HCFCs that are usually collected from many sources.

If the country has its own ODS reclamation facility(ies), it is recommended that "proof of origin" is required also for HCFCs produced by those facilities, and that at the same time the placing of recycled HCFCs on the market is banned – see item 4 and 7 below.

2. Advantages / impacts / benefits

The advantage of including a requirement for "proof of origin" in a country's legislation is that it helps guarantee the legality of the shipments and prevents mislabeling or counterfeiting of the containers, so it is very unlikely that for example CFCs would be shipped or placed on the market under the name of HCFCs. If the placing on the market of recycled HCFCs is banned as an additional measure (see item 4 below), establishing the requirement for the "proof of origin" would help to prevent illegal trade in HCFCs. Such an additional measure would also create a strong incentive for establishing new reclamation facilities for HCFCs that could be advantageous since the supply of virgin HCFCs would slowly diminish along with progress in global HCFCs phase-out. The advantages of the "proof of origin" were noted during the "Industry Summit on Tackling Illegal Trade in ODS" organized on 2 December 2008 in Brussels by the Environmental Investigation Agency with support from the European Commission and the major ODS producers.

3. Disadvantages / efforts / costs

There are no clear disadvantages of such

8. Decisions IV/24 and VI/19 of the Parties to the Montreal Protocol.

an approach, although obviously it would create additional administrative burden for the producer who is supposed to issue the "proof of origin". If the ban on placing on the market of recycled HCFCs would accompany a requirement for "proof of origin", it would mean some limitations for refrigeration servicing companies that would no longer have possibility of trading with recycled HCFCs.

4. Support measures required for effective implementation

A very useful support measure would be implementing a ban on the placing on the market of recovered/recycled HCFCs (but not reclaimed HCFCs). In practice it would mean that the entity (usually a servicing company) who recovered the HCFC from equipment would not be allowed to sell that recovered HCFC (or give it away free of charge) to another entity, but would be allowed to use that recovered HCFC (optionally after basic cleaning) in the same or other equipment, i.e. recycle it, or send it either for reclamation or for destruction.

5. Criteria to define most suitable implementation schedule

The implementation of this option should start at the beginning of restrictions on HCFCs under the Montreal Protocol, i.e. 2013, though earlier implementation should help to prevent illegal trade and facilitate the HCFCs phase-out in the future.

6. Criteria for decision making to implement/not to implement

The main criterion for making the decision whether or not to implement a "proof of origin" system would be the interest of the country to use all possible measures to prevent illegal HCFC trade.

7. Status of implementation in selected countries

At present no countries formally require "proof of origin" for ODS, but such a requirement for a document called "certificate of origin" is contained in CITES Convention that deals with international trade in endangered fauna and flora. In the European Union, this measure has not yet been implemented for HCFCs, however it has been included in the new recast Regulation on ODS, replacing the Regulation 2037/2000 on ODS. From 1 January 2010, there is a total ban on HCFCs imports into the EU (except for imports for destruction and for exempted uses comprising laboratory and analytical essential uses or feedstock and process agent uses) and only reclaimed or recycled HCFCs will be allowed for servicing the refrigeration and air conditioning equipment. The "proof of origin" will be required for reclaimed HCFCs placed on the market.

8. Links and resources

- Notes and recommendations from Industry Summit on Illegal Trade in ODS - available from : fiounnala.walravens@eia.international.org
- CITES Convention text - available on http://www.cites.org

Fees for HCFC imports / placing on the market

1. General description

Fees for imports or placing on the market provide a disincentive to use certain chemicals (or any other goods). Therefore they can be a useful tool in assisting the HCFC phase-out process.

While import fees are relatively straightforward and applicable to any quantity of HCFC (or ODS or other chemicals) imported into the country, the "placing on the market fee" requires further explanation:

- "Placing on the market" does not always have the same meaning – e.g. in the European Union (EU) Regulation 2037/2000 on ODS it means any "supplying or making available to the third party" while in the EU Regulation 842/2006 on F-gases it means "supplying or making available to the third party for the first time".
- A "placing on the market fee" for HCFCs would not apply to manufacturers of HCFC products or equipment if they don't buy them from importers or dealers on the local market, but import them directly from a third country.
- Allowing exemptions from the fee or introducing a mechanism to allow the reimbursement of the fee could be considered to prevent market distortions. Such a situation may occur when: local manufacturers of HCFC products (e.g. polyol blends for foams or just foams) or HCFC equipment (e.g. refrigeration equipment) would need to pay an import fee whereas manufacturers of similar products or equipment in other countries where no fees have been imposed can sell their goods to the country where there is a fee in place.
- In such a case, fees should also be imposed on HCFC products and equipment while allowing for reimbursement of the fee if the products or equipment are exported.
- Banning imports of such HCFC products or equipment while allowing their manufacture in the country would not be possible as it would break international trade rules.

The possibility of excluding HCFCs from an import fee should also be considered if they are imported for exempted uses (feedstock, process agents, laboratory and analytical uses) or for destruction.

In order to allow differentiation of the various HCFCs or various HCFC-containing mixtures, the level of such a fee for each major HCFC and HCFC-containing mixture (as well as other ODS and HFCs) could be determined depending on its market price, its ODP and possibly also GWP – see item 7 for some examples. If fees are imposed on HCFCs but not on HFCs, the unintended effect may be the promotion of HFCs. Therefore, a similar approach should also be considered for HFCs.

2. Advantages / impacts / benefits

There are three major benefits of imposing import fees on HCFCs:

- Creating disincentives for using expensive HCFCs and thus incentives for using alternative refrigerants (as mentioned above this may promote HFCs if there is no fee applied to them)
- Achieving better recovery rates – demand for recycled or reclaimed HCFCs would increase due to their lower market price as compared to virgin HCFCs
- The unique possibility of creating an "ODS environment fund" out of the fees collected that would finance costs related to ODS phase-out, such as bonuses for recovery (see item 4) or creation and operation of ODS databases (see "Mandatory HCFC logbooks" and "Mandatory HCFC equipment logbooks" options - pages 29. and 31.) or financing ODS disposal.

3. Disadvantages / efforts / costs

If not properly designed and implemented, there is a risk that the competitiveness of the local manufacturers of such products and equipment is negatively affected. Therefore, import fees on HCFCs (and mixtures) should be introduced together with fees on HCFCs contained in imported products or equipment. Once there is a ban on imports of such products and equipment and a ban on manufacturing them in the country, this risk would no longer exist. Another aspect is that import fees may create incentive for illegal trade to avoid this.

4. Support measures required for effective implementation

Accurate reporting by importers (see "Mandatory reporting by HCFC importers and exporters" option on page 3.) would be necessary for effective implementation of fees for HCFC imports and therefore keeping HCFC logbooks (see "Mandatory HCFC logbooks" option on page 29.) would be helpful in that respect. Strengthening of border control and enforcement agencies would be needed to reduce the risk of illegal trade in HCFCs resulting from their higher market price in the country which has introduced the import fee. Another support measure would be creating financial incentives for HCFC replacements, especially those which are not potent greenhouse gases, such as ammonia, CO_2 or hydrocarbons. At the same time, unintended incentives for the use of HFCs should be avoided.

5. Criteria to define most suitable implementation schedule

An appropriate time for the introduction of fees is the date when domestic manufacturing and import of HCFC-containing products and equipment is introduced. This would eliminate the need of imposing additional fees on HCFCs contained in imported or locally manufactured products and equipment – see item 4.

6. Criteria for decision making to implement / not to implement

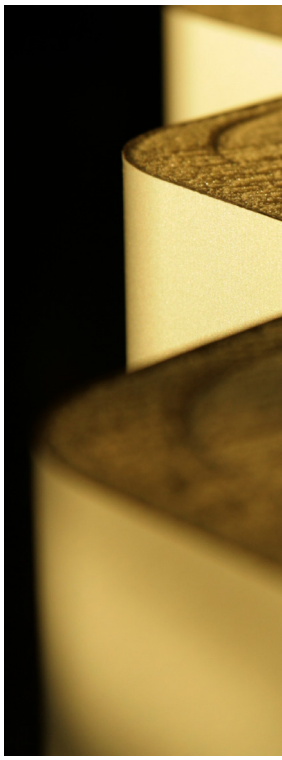
Import fees can only be considered by countries, which are not bound by international trade agreements that do not allow the introduction of import fees. When considering the introduction of import fees, the country should be prepared to implement certain support measures mentioned under item 4. Without these support measure, the introduction of import fees may not be effective.

7. Status of implementation in selected countries

Australia established import levies on all ODS (including HCFCs) and synthetic greenhouse gases (including HFCs). The levy for HCFCs in Australia is Aus$ 3/kg (ODP) and for HFCs – Aus$ 0.165/kg (metric). Certain European countries (e.g. Denmark and Norway) have introduced fees for HFCs entering their territory. The level of HFC import fees in Denmark and Norway depends on GWP and can be up to 200% (and in specific cases even 600%) of the market price for certain mixtures, so these two examples may be difficult for developing countries to follow. Poland introduced fees for HCFCs which depend on ODP and which should not exceed the V.A.T. calculated for the particular substance.

8. Links and resources

- Ozone Protection and Synthetic Greenhouse Gas Regulations 2004 (Import Levy) – Australian regulations regarding the HCFC import levy available at www.comlaw.gov.au/ComLaw/Legislation/
- Polish Regulation by Minister of Environment on fees on controlled substances (Polish J. of Laws 2005, No 13, item 107) - available from: kozak@ichp.pl



Electronically operated licensing system for HCFCs

1. General description

Introducing electronically operated licensing systems requires not only the development of customized computer programmes, but also computerization of importing and exporting companies and of customs offices where HCFCs are declared for customs clearance.

Importers or exporters have their own usernames and passwords that allow them access to their own applications and licenses. The system operator (usually the competent authority) and customs can see all applications and all licenses issued and access them for verification and approval (system operator) or for recording that part of a licensed quantity has been used, as well as for closing the license (customs). The following shows a simplified scheme how such a system may operate:

1. Importer or exporter registers and applies for a license on the website created specifically for this purpose using the specially designed form to be filled in electronically.

2. The application is automatically verified by the system for compliance with the relevant legislation (chemical name, customs code, country of destination/origin, any additional requirements) and with the importer's quota.

3. The system displays a generic message: "Waiting for approval" if the application has been positively verified or "Needs correction" if it has not, and sends an automatic notification by email to the system operator and the applicant. If the application needs correction, the system will indicate what needs to be corrected.

4. If the system indicated that the application needs correction, the applicant makes it on the website. If not, the system operator verifies it manually and inserts his electronic approval (sometimes called "Visa"). If he finds that something is wrong, he sends an e-mail to the applicant with a request to make the necessary correction.

5. After an approval is made, the system automatically produces the license document and sends the notification by email to the applicant, so he can print out his license from the website[9] .

6. The applicant shows the license to customs and the customs officer has to enter the relevant website and check whether the license was actually approved.

7. After customs clearance is completed, the customs officer closes the license on the website, if the licensed quantity has been exhausted. Otherwise, the officer records on the website (and on the paper license if that was presented to him) the quantity actually imported and the quantity still left.

9. Printing the license may not be necessary if presenting the paper license to the customs is not required in the relevant legislation.

Some countries may require that the manually signed paper license accompanies the electronic one in order to better prevent illegal activities related to the use of such electronic system in practice. In such a case, the system operator has to print out the paper license, stamp and sign it and send it to the applicant. Only a stamped and manually signed license is valid and it should be returned to the licensing system operator by customs after clearance is completed.

2. Advantages / impacts / benefits

The advantage of an electronic system is that it definitely requires less paperwork than a manual one, so a less personnel time may be required. The benefit for importing and exporting companies as well as customs offices is that once they have become computerized, the process is easy and fast. The system also provides for instant access to the necessary data and thus facilitates customs clearance.

3. Disadvantages / efforts / costs

The introduction of electronically operated licensing system can be quite costly (e.g. the costs of developing the computer programme, maintaining the website, computerizing the customs posts). Despite its automated character, such a system requires dedicated and trained personnel.

4. Support measures required for effective implementation

The availability of concise instruction manuals and organizing customized training for importers, exporters, customs officers and for the system operator would assist them in getting acquainted with the system. Introduction of import quotas for HCFCs and permits for each HCFC shipment (see "Import quotas for HCFCs" option, and "Permits for each HCFC shipment" option, on pages 1 and 13 respectively) would be another support measure. Electronically operated systems would not be economically effective just for HCFCs, so it should rather be part of the system covering all ODS or all customs goods. Establishing an informal Prior Informed Consent (iPIC) procedure with exporting countries may also be helpful – see "Guidelines for implementation of informal Informed Prior Consent (iPIC) procedure" developed by UNEP DTIE.

5. Criteria to define most suitable implementation schedule

There is no specific implementation schedule of electronically operated licensing systems that could be recommended. However, some experience in manual (paper) licensing of HCFCs would be advantageous.

6. Criteria for decision making to implement / not to implement

The main criterion for decision making to implement / not to implement electronically operated licensing system is the level of computerization of country's private sector and customs agency and the government's will to spend the necessary money to develop and maintain such a system. This would only make economic sense if there is a high number of licenses to be dealt with or if it would apply to all ODS or other customs goods.

7. Status of implementation in selected countries

The European Union has an electronically operated import-export licensing system in place that includes all ODS, which became fully operational in 2010. Among developing countries Turkey has recently developed an electronically operated import-export licensing system that includes HCFCs, but there has not been enough experience gained yet to fully assess its functionality.

8. Links and resources

- Information on the EU licensing system is available on http://ec.europa.eu/environment/ozone/ods
- "Guidelines for implementation of informal Informed Prior Consent (iPIC) procedure" are available on http://www.unep.fr/ozonaction

Licensing system extended to include HFCs and HFC – containing mixtures

1. General description

HFCs and HFC-containing mixtures do not contribute to ozone layer depletion but are potent greenhouse gases. Extending existing import/export licensing system for ODS to include HFCs and HFC-containing mixtures should not be difficult because HFCs are used as ODS replacements in similar applications as ODS. Importers and exporters of ODS and HFCs would be usually the same companies. The purpose of extending ODS licensing system to HFCs at this stage is not to impose any controls, but to monitor the use of HFCs and prevent illegal trade in ODS through mislabelling or misdeclaring ODS shipments as HFCs. The following table lists applications where HFCs are frequently used as ODS replacements:

The inclusion of HFCs and HFC-containing mixtures would not change the structure and operation of the import/export licensing system. Some optional elements suggested for HCFCs presented in this booklet may also be applicable to HFCs.

The lack of individual Harmonized System (HS) customs codes for HFCs as a group of chemicals needs to be addressed since HS code 2903 30 covers not only HFCs, but also other chemicals. The Combined Nomenclature (CN) customs classification system[11] covers all HFCs under code 2903 30 80 but does not distinguish between different HFCs. With regard to HCFCs, there are no individual codes for HCFCs in the HS[12], but there are individual CN codes for HCFC-22 (2903 49 11) and HCFC-141b (2903 49 15). Other HCFCs are classified under CN code 2903 49 19. Mixtures containing HFCs (or/and PFCs) have their own code in the HS – 3824 78. However, if the mixture contains also CFCs or HCFCs in addition to HFCs or/and PFCs, the code for mixtures containing CFCs (3824 71) or HCFCs (3824 74) applies, respectively.

2. Advantages / impacts / benefits

There are several advantages of extending the existing ODS import/export licensing system to also cover HFCs and HFC-containing mixtures. The first advantage is that illegal trade in ODS would be diminished because CFCs (and HCFCs in countries where their use is restricted) have been found to be mislabeled and traded under as HFCs, which in many countries are not yet subject to licensing. The second advantage is that the competent authorities in the country would be able to

Application	ODS frequently used in that application	HFCs or HFCs-containing mixtures frequently used in that application
Refrigerants	CFC-12, HCFC-22, R-409A, R-401A, R-408A[10]	HFC-134a, HFC-143a, R-407C, R-410A, R-404A, R-417A, R-422D
Foam blowing agents	CFC-11, HCFC-141b	HFC-245fa, HFC-365mfc, HFC-227ea
Fire extinguishers	Halons	HFC-236fa, HFC-227ea
Solvents	CFC-113, HCFC-225, HCFC-141b	HFC-365mfc, HFC-43-10mee
Aerosol propellants	CFC-11/CFC-12, HCFC-22	HFC-134a, HFC-152a

10 Blend of HCFCs and HFCs.
11 CN is an eight digits system comprising six digits international HS system extended by two digits used in the European Union (EU) and several other countries.
12 Recently, WCO (World Customs Organization) has considered proposal from Mauritius to introduce different customs codes for 5 most commonly used HCFCs and it is expected that once the final WCO approval is given, those HCFCs will have their own HS codes starting from 1 January 2012.

monitor and control the pace of ODS replacement with alternatives and – if so decided – promote ODS replacement with non-HFC alternatives such as CO_2, ammonia or hydrocarbons, as appropriate. This would allow the country to simultaneously achieve ozone and climate protection benefits. Additional benefits could be achieved if the import / export licensing system were further extended to include not only HFCs, but also other F-gases covered by the Kyoto Protocol (PFCs and SF_6).

3. Disadvantages / efforts / costs

The major constraint in extending the ODS import / export licensing system to cover HFCs would be the significant increase in administrative workload needed to manage the system. The implementation of an electronically operated licensing system would reduce that workload.

4. Support measures required for effective implementation

One crucial support measure would be the inclusion of individual customs codes for the main HFCs in the country's national customs classification system that is usually based on the six digit HS code or the extended eight-digit CN system. Adding an additional (ninth) digit at the national level would allow monitoring and control of trade of the main HFCs. For effective implementation it would be necessary to provide extended training to customs officers and environmental inspectors.

5. Criteria to define most suitable implementation schedule

Once the country decides on the necessity to monitor and control trade in HFCs and HFC-containing mixtures, the ODS import / export licensing system could be extended to cover HFCs as early as possible. Necessary support measures should be in place.

6. Criteria for decision making to implement / not to implement

This measure could help to achieve a smooth ODS phase-out and simultaneous climate benefits by limiting HFC use. This measure would be particularly meaningful for countries with an high or increasing HFC consumption and thus a high level of dependency of the country's industry on HFCs.

7. Status of implementation in selected countries

Neither in the major HFCs exporting countries (European Union (EU), United States, China, India) nor in HFC importing Article 5 countries this measure has been implemented or planned to be implemented in the near future.[13] However, certain countries have established trade measures related to HFCs. Denmark has a total ban on HFCs while Bulgaria used to operate an import/export licensing system for HFCs before it acceded to the EU and had a positive experience in using the system to avoid illegal trade in ODS.

8. Links and resources

- Danish legislation on HFCs can be found on : http://www.mst.dk/English/Chemicals/Legislation/Fact_sheets/Fachsheet_no_46.htm

13 It can be anticipated that if the HFCs production and consumption control measures were to be introduced at some time in the future, establishing HFCs import / export licensing system would become an obvious element of a relevant possible international agreement.

Options related to restrictions on use

photo courtesy of Heivert Koppen

Specific phase-out schedules and use bans for HCFCs

1. General description

Establishing specific phase-out schedules and use bans is a highly recommended option that - if undertaken at an early stage - would definitely facilitate the HCFCs phase-out.

Establishing specific HCFC consumption phase-out schedules may be part of a country's policy framework to implement the Montreal Protocol provisions related to HCFCs. In practical terms, this means either establishing:

- a revised phase-out schedule for all HCFCs that would allow the reduction of HCFC consumption ahead of the accelerated schedule of the Montreal Protocol, or

- specific phase-out schedules for selected HCFCs or selected groups of HCFCs.

The first option, which treats all HCFCs as a single basket of substances, is a simple approach that requires only adjustments to existing ODS legislation and may be combined with use bans that help achieve the new consumption targets. The second option (specifying the specific phase-out schedules for selected HCFCs) is a more complex exercise requiring certain preliminary steps, but which may have some advantages (see sections 2- 4 below). If this option is selected, the choice of order by which particular HCFCs or particular groups of HCFCs would be phased-out may be based on either:

- their ODP value - phasing out higher ODP HCFCs first, e.g. establishing earlier phase-out date for HCFC-141b which is very widely used as a foam blowing agent and has an ODP of 0.11, or alternatively for all HCFCs that have ODP of 0.06 or more – this would include not only HCFC-141b, but also HCFC-142b, another foam blowing agent that has an ODP of 0.065,

- their share in the country's total HCFCs consumption expressed in ODP tonnes, i.e. their actual impact on country's compliance with the Montreal Protocol phase-out schedules.

Establishing use bans means in practical terms setting up deadlines after which the use of HCFCs in selected applications will not be allowed. If this option is selected, there are certain approaches that may be undertaken, including *inter alia* to start with the uses:

- which are not very large in terms of ODP tonnes used

- where HCFCs could be replaced most easily, faster or at a lower cost

- to start with the uses which are most emissive (solvents, aerosol propellants, fire extinguishants).

It is important to decide whether the ban would apply to the whole sector (e.g. foam blowing) in which case there would be just one deadline for using HCFCs in all applications in that sector (e.g. for blowing of all foams, including production of polyol blends or other premixes for foams) or there would be different deadlines for different sub-sectors (e.g. rigid polyurethane (PUR) foams and flexible PUR foams or expanded polystyrene (XPS) foams). Certain exemptions (e.g. military uses) may also be considered.

2. Advantages / impacts / benefits

The advantage of establishing either the specific HCFC phase-out schedules and/or use bans for HCFCs or a combination of both is that these options allow for smooth and well-

controlled HCFC phase-out and that (specifically in case of use bans) the most suitable solutions may be decided based on consultations with the concerned industry, so that the impact on the particular industry sectors is minimized.

3. Disadvantages / efforts / costs

The disadvantage of applying specific phase-out schedules and/or use bans for HCFCs is that implementation of such measures requires more involvement of the government administration including careful monitoring of the relevant industry sectors and optionally also introducing specific additional controls at the stage of import and placing on the market of HCFCs (see item 4 below). This may create some additional cost, but it is a worthwhile investment to ensure smooth HCFC phase-out.

4. Support measures required for effective implementation

Surveys of all industry sectors where the HCFCs are currently being used are needed, particularly if the introduction of use bans is planned. Such surveys will prepare the ground for decision making by answering some substantial questions: Which sectors would suffer least from the use bans? What could be the realistic phase-out dates for particular sectors? Is there a need for specifying different deadlines for different sub-sectors? Requiring that HCFCs users keep logbooks and report data to the competent authority (see "Mandatory HCFC logbooks" option on page 29) will help very much in the collection and further analysis of the country's HCFC use data. Moreover, definition of "use" and a precise description of particular sectors or sub-sectors will usually be included in the relevant legislation. If the country for some reason does not wish to establish direct ODS use bans or restrictions, the tool that would bring similar (but limited) effect may be restricting public sector procurement to non-ODS products or equipment. However, one has to realize that such procurement rules would apply only to the public sector.

5. Criteria to define most suitable implementation schedule

The specific implementation schedule will depend on the results of the data surveys and on the decision which approach will be taken either for selection of HCFCs for establishing specific phase-out schedules or for selection of uses for the use bans – see description of possible approaches under item 1 above. The general rule is "the sooner the better" for ensuring earlier compliance with the committed policy targets.

6. Criteria for decision making to implement / not to implement

The criterion should be the realistic possibility of advancing the phase-out schedules for all (or part of) the HCFC basket or phasing-out selected uses faster if those are not crucial for country's economy.

7. Status of implementation in selected countries

The European Union has a complex system of HCFC use bans that includes specific deadlines for use of HCFCs in particular sub-sectors and certain exemptions. Similar use bans have been established in Canada. Some other countries, e.g. United States, have in place a step-by-step system of phasing out HCFCs from various uses, starting with those HCFCs which have high ODP (e.g. HCFC-141b). Belarus introduced the public procurement restrictions on HCFCs-containing products and equipment which may assist them in phasing out HCFCs.

8. Links and resources

- Regulation (EC) No 2037/2000 (EC) of the European Parliament and of the Council of 29 June 2000 on substances that deplete the ozone layer (OJ L 244, 29.9.2000), as last amended[14].
- United States Federal Regulations – available on http://www.epa.gov/ozone/strathome.html
- Canada Federal Halocarbon Regulations 2003 – available on http://www.ec.gc.ca/ceparegistry/documents/regs/g2-13718_r1.pdf

14. Consolidated version of Regulation (EC) 2037/2000 is available on http://eur-lex.europa.eu. Regulation 2037/2000 is planned to be replaced with the recast regulation on ODS as of 1 January 2010.

Ban on new HCFC installations

1. General description

Banning new HCFC installations would reduce dependency on and demand for HCFCs, especially if there is no ban on manufacturing and importing products and equipment containing or relying on HCFCs – see "Restrictions on imports / placing on the market of products and equipment containing or relying on HCFC" option on page 9. In practice, such a ban on new HCFC installations allows the continued operation of existing HCFC installations, but no new installations relying on HCFCs can be constructed and no HCFC equipment can be added to any existing HCFC installation. National legislation introducing a ban of new HCFC installations should include this specification as otherwise new HCFC equipment could be added to existing HCFC installations and thus circumvent the ban.

For clarity, the legislative text needs to define the terms "new" and "installation". "New" in that respect refers to "not existing at the date the relevant legislation enters into force" or "not existing before a specific date" which has been decided by the legislator and which needs to be later than the date of entry into force of the relevant legislation. "Installation" in that context refers to "stationary structure constructed and equipped for the particular industrial or commercial purpose". Such a definition will cover all stationary commercial and industrial refrigeration and air-conditioning equipment as well as all industrial foam-making plants and other industrial production lines. This definition meets the objective of introducing such a ban since the major use of HCFCs is in this type of equipment.

2. Advantages / impacts / benefits

A ban of new HCFC installations would promote (or even enforce) the introduction of non-HCFC technologies and thus facilitate the HCFC phase-out. If the above definition of "new" is applied, such a ban would automatically stop the dumping of obsolete HCFCs technologies in that country. The advantage of introducing a ban on new HCFC installations compared with a the general ban on manufacturing and import of HCFC equipment (see "Restrictions on imports / placing on the market of products and equipment containing or relying on HCFC" option on page 19) is that it has a purely internal (domestic) character and does not interfere with international trade rules. However, it has the same effect in terms of diminishing the future market demand for HCFCs. In comparison, banning the "use" of HCFCs in all installations in a particular sector (see "Specific phase-out schedules and use bans for HCFCs" option on page 24) would be a much stricter approach since it would also cover existing HCFC installations. A ban of new HCFC installations would allow a smoother phase-out.

3. Disadvantages / efforts / costs

Banning new HCFC installations would not stop the use of HCFCs in existing installations. Therefore, the demand for HCFCs would not decrease and may remain at a similar level. However, it would prevent an increase in HCFC consumption. For a few specific applications identified by the Technology and Economic Assessment Panel of the Montreal Protocol, non-HCFC alternative technologies may not yet be commercially available or may be more expensive. Therefore, banning all new installations may disturb the development of specif-

ic sub-sectors. Although there is only a small probability that such a situation will occur, the relevant legislation may contain a special provision allowing an exception if it is proven that no alternative technologies are commercially available.

4. Support measures required for effective implementation

An essential support measure that would assist in the implementation of a ban on new HCFC installations would be creating incentives for building new installations utilizing alternative technologies. Such incentives could involve exemption from taxes (or decreased taxes) and providing financial support (grants, credits, loans, etc.). The continued use of existing HCFC installations could also be discouraged through environment taxes and the creation of an Environment Fund (see "Fees for HCFC imports / placing on the market" option on page 17). In general, access to up-to-date information on non-HCFC technologies, e.g. through a dedicated website of the National Ozone Unit or the national refrigeration and air-conditioning association, would promote the transition to non-HCFC alternatives.

5. Criteria to define most suitable implementation schedule

Introducing a ban on new installations that use HCFCs would be an ideal measure to be introduced at the date when the freeze in HCFC consumption in Article 5 countries is set (i.e. the 2009-2010 period), so that HCFC consumption would not increase between then and 2013, when the freeze starts. Therefore, it is highly recommended that the ban on new HCFCs installations is implemented at once.

6. Criteria for decision making to implement / not to implement

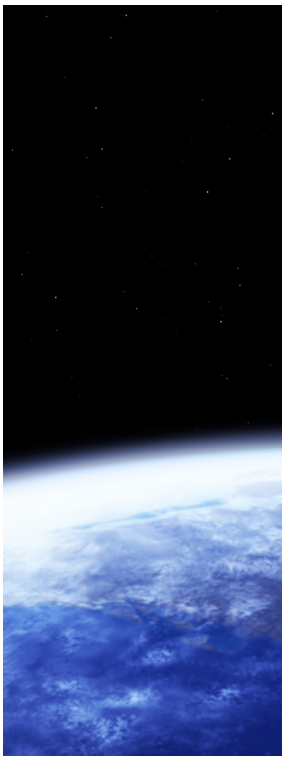
All Article 5 countries may consider the implementation of this measure, though it would be especially meaningful for those countries where HCFCs consumption is growing fast and which face a risk that the HCFCs freeze in 2013 on average 2009-2010 levels may not be achieved.

7. Status of implementation in selected countries

In only a few countries ODS regulations contain restrictions on building new installations utilizing HCFCs. In 2004 Poland introduced a ban on extending the existing installations relying on HCFCs in the refrigeration and air-conditioning sector and building new HCFC installations. The major objective of the ban was to prevent continuous dumping of obsolete HCFC equipment to Poland. As a result, the consumption of HCFCs for servicing refrigeration and air-conditioning equipment in Poland did not increase until 2005 and after this began to decrease. Turkey has recently introduced a similar ban and expects to see similar results. In the European Union (EU) and in the United States the use of virgin HCFCs will be soon prohibited for charging refrigeration, air conditioning and heat pump equipment (in the United States the ban would concern new equipment only), so actually installing new equipment relying on HCFCs would be strongly discouraged.

8. Links and resources

- Polish Act on ODS of 20.04.2004 (Polish J. of Laws 2004, No 121, item 1263), available from : kozak@ichp.pl



Options related to record keeping

3

Mandatory HCFC logbooks

1. General description

In practical terms, keeping logbooks entails making notes of specific data using a standard format established by the relevant legislation. The question that is to be answered by decision makers is which entities should be covered by the logbook system, what kind of data are to be placed in the logbook and format that is to be applied.

Best practices in logbook keeping includes :

- The entities covered should include HCFC importers and exporters, HCFC users[15], those entities who place HCFCs on the market (ie HCFC dealers)[16] and those entities who recover, recycle or reclaim HCFCs. If there are destruction facilities in the country, the entities that destroy HCFCs should also be included.
- One logbook is kept for each type of HCFC (or HCFC-containing mixture).
- The data to be placed in the logbook include at the minimum: the name and address of the entity and name of the person who made the note, date of the note, category of transaction undertaken with HCFC (importing, exporting, selling, buying, using – specifying for what purpose, recovering, recycling, reclaiming) and the quantity of HCFCs involved.
- The requirement for keeping logbooks is supplemented with the mandatory annual reporting of data contained in the logbook to the competent authority, although certain countries require registration and recording data only without the reporting obligations.

2. Advantages / impacts / benefits

Mandatory HCFC logbooks facilitate the monitoring of how the provisions of the HCFC legislation are being followed by the relevant entities and (if supplemented with reporting requirements) allow for effective monitoring of HCFC flow to/from the country and inside the country, as well as making best estimates of quantities of HCFCs used in particular sectors, and also of HCFC quantities being recovered, recycled and reclaimed. No other measure can be so effective for ensuring appropriate HCFC management, which is required to achieve a smooth and successful phase-out. It will be most useful when a country decides to phase out HCFCs on a use-by-use basis. Another important benefit is that engagement in this system will increase the awareness of the relevant entities of the need for eliminating HCFCs in the near future.

3. Disadvantages / efforts / costs

Establishing the requirement for keeping HCFC logbooks that would involve many entities and also reporting by those entities (see item 4 below) would mean much more administrative work for the entities involved (and for the competent authority, if reporting is also required), but it would be worth the effort put in, taking into account inevitable advantages (see item 2 above).

4. Support measures required for effective implementation

A substantial support measure to supplement the mandatory keeping of HCFC logbooks is a

15. The term "use" should be defined in the relevant legislation if HCFCs "users" are to be covered by the mandatory logbook system.
16. The term "placing on the market" should be defined in the relevant legislation if those who place HCFCs on the market are to be covered by the mandatory logbook system. For discussion of "placing on the market" definition see also "Restrictions on imports / placing on the market of products and equipment containing / relying on HCFC" chart on page 13.

reporting requirement by all who are involved in that system. Reporting should be done by a specific deadline, (e.g. 28 February) and the reports should be sent to the competent authority (or the institution authorized by that authority) that will operate the database. Optionally, the reports may be sent using to a website created specifically for that purpose. Another useful support measure is the organization of short trainings for the particular groups of entities involved (e.g. representing particular sectors).

5. Criteria to define most suitable implementation schedule

If the country decides to implement this measure, it should be done promptly since some time may be needed for all relevant entities to join the system.

6. Criteria for decision making to implement / not to implement

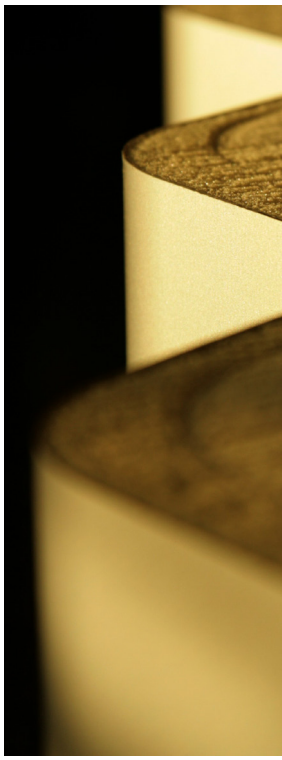
The main criterion for deciding whether or not to implement this measure is the level of the country's ambition regarding the monitoring and control of its HCFC use. If the country is committed to stricter controls on HCFCs and will phase out those chemicals as soon as possible, implementation of mandatory keeping of HCFC logbooks, optionally supplemented with mandatory reporting by the entities involved, will be a great step towards that goal.

7. Status of implementation in selected countries

India has in place a very well developed system of registration of all entities which handle ODS (including HCFCs), but there is no reporting obligation (except for importers, exporters and producers). Moreover, ODS in India cannot be purchased unless there is a declaration made to the seller on intended use. In the United States each entity that sells HCFCs has to keep records for a minimum of three years. Poland (and recently Spain) introduced a full system of keeping HCFC logbooks into their national legislation supplementing the main European Union ODS regulation. Poland established its system of logbooks for ODS (including HCFCs) in 2004, which has been successful. The number of entities that were keeping logbooks and sending data increased each year. At present, about 1000 entities report to the Polish Ozone Layer and Climate Protection Unit that was authorized by the Ministry of Environment to collect and analyse data reported annually to a database, based on an original computer programme designed specifically for that purpose. The analysis of data is presented each year to the Ministry, which greatly assists them in developing the policy related to ODS, including HCFCs.

8. Links and resources

- Indian legislation concerning ODS is available on http://www.ozonecell.com
- USA legislation concerning ODS is available on http://www.epa.gov/ozone/strathome.html
- Polish Act on ODS of 20.04.2004 (Polish J. of Laws 2004, No 121, item 1263) [17]
- Polish Regulation by Minister of Economy and Labour on keeping logbooks of controlled substances (Polish J. of Laws 2004, No 185, item 1911)[3]



Mandatory HCFC equipment logbooks

1. General description

The main role of HCFC logbooks described in "Mandatory HCFC logbooks" option on page 29. is obtaining data on the flow of HCFCs in the country starting from the moment they are produced or cross the country borders, until the moment they are either used or exported. The main purpose of equipment logbooks, however, is to provide data on HCFC emissions that can help to verify the compliance with obligations related to HCFC recovery from larger equipment and related to leak checking of such equipment.

There are several questions which have to be answered before taking a decision on the final design of an "equipment logbook" system:

Question 1: *Which sectors are to be covered – the refrigeration sector only or also other sectors, e.g. the foam or solvent sectors?* It is recommended that the main sector to be considered is refrigeration, i.e. refrigeration, air-conditioning and heat pump equipment is covered, so that intentional venting of refrigerant during servicing and maintenance operations is prevented.

Question 2: *What should be the lower limit of the refrigerant charge in the equipment to require keeping logbooks?* For example, the EU defined 3kg as the limit. However, countries may opt for lower limits, e.g. 1kg. Some experts argue that excluding equipment of charge between 1 kg and 3 kg would mean that the majority of the most leaking equipment is excluded. On the other hand, taking into account such low charge equipment would mean in certain countries tens of thousands of pieces of equipment to be included in the logbook system, which would be difficult to monitor.

Question 3: *What kind of equipment is to be covered – both stationary and mobile or just stationary?* Although EU regulations focus on stationary equipment, most experts agree that the highest leakage rates occur in mobile equipment.

Question 4: *Should there be any exemptions?* Countries may decide to exempt some uses, e.g. military, from the general obligation of keeping equipment logbooks. But in general there would not be any justification to grant exemptions.

Question 5: *What kind of data should the equipment logbook contain?* As an example, the European Union Regulation 842/2006 on F-gases requires the following data: type of equipment[18], refrigerant charge, quantity and type of refrigerant contained in the equipment, quantities recovered and added during servicing or maintenance and at final disposal, names and addresses of the servicing company or the technician who performed servicing or maintenance, dates and results of conducting the servicing, maintenance, recovery or checks for leakage.

Question 6: *What could be the structure of the data reporting system if data reporting is required (see item 4 below)?* Efficient data reporting would require an electronic system, e.g. a website, which would facilitate data recording and transmission to the National Register of equipment users[18] held by the competent authority or by the independent entity designated by the competent authority. Such a website could be designed in a similar way to the one suggested for electronically operated licensing systems (see "Electronically operated licensing system for HCFCs" option on page 19. The website would be managed by the National Register operator designated by the competent authority.

18. In the European Union Regulation 842/2006 the term "equipment (or system) operator" has been introduced. Equipment (or system) operator is a legal or natural person who exercises the actual power over the technical functioning of the equipment (or system). It seems quite useful that the countries who wish to implement the equipment logbooks for HCFCs introduce also that term in their legislation.

2. Advantages / impacts / benefits

Mandatory HCFC equipment logbooks, similar to the mandatory HCFC logbooks, facilitate the verification of compliance with the provisions of national HCFC legislation by the relevant stakeholders (in this case – equipment users) and, if supplemented with reporting requirements, allow for effective monitoring of HCFC quantities being recovered and HCFC quantities being added to the equipment, which makes it possible to calculate actual emissions from particular types of equipment. The creation of a National Register of equipment users would allow the competent authority to learn where HCFC are used in the country and in what quantities. Data obtained from the equipment logbooks may be cross-checked with data obtained from HCFC logbooks, so more reliable information on HCFC recovery rates and HCFC emissions is obtained.

3. Disadvantages / efforts / costs

Introducing mandatory HCFC equipment logbooks would involve many equipment users country-wide and all of them would be required to report data. This would result in additional administrative work for the entities involved (and for the competent authority), but it would have numerous advantages – see item 2 above. If a National Register of equipment users is created it would also involve cost associated with development and operation of the system.

4. Support measures required for effective implementation

Mandatory HCFC equipment logbook keeping would require reporting by all who are involved in that system (see item 1 for suggested design of the reporting system). Users of equipment monitored by the equipment logbook system should receive training. If the creation of a National Register of equipment users is decided, the same register could also include users of HFC equipment.

5. Criteria to define most suitable implementation schedule

If the country decides to implement this measure, it could be initiated immediately understanding that the implementation requires significant time in order to establish the system and to involve and train all equipment users.

6. Criteria for decision making to implement / not to implement

The main criterion for decision makers would be the level of ambition regarding the monitoring of HCFC recovery and emissions in the refrigeration and air-conditioning sector. It should be noted that lower emissions mean reduced demand for HCFC (see "HCFC emissions control measures" option on page 34 for details), so any measure that allows for limiting the emissions may be considered as part of HCFC phase-out policy.

7. Status of implementation in selected countries

In India all users of ODS, including owners of HCFC equipment must register, but there is no obligation of record keeping or reporting data. The obligation for record keeping for equipment containing 3 kg or more has been included in the new European Union (EU) recast ODS Regulation with regard to HCFCs. It is already included in EU Regulation 842/2006 on F-gases which obliges equipment users to make data available, but it does not require mandatory data reporting. The electronically operated National Register of large ODS (and also HFC) equipment operators is planned in the new Polish legislation on ODS and on F-gases (not yet published).

8. Links and resources

- Regulation (EC) 842/2006 of the EP and the Council of 17 May 2006 on certain fluorinated greenhouse gases (OJ L 161 0f 14.06.2006) available on http://eur-lex.europa.eu

Options related to emission prevention

HCFC emission control measures

1. General description

Emission control measures are generally not included in the Montreal Protocol[19], but it is obvious that the ozone layer will benefit from the control of ODS emissions from products and equipment. With regard to HCFCs, which are widely used in various applications (see detailed information contained in UNEP DTIE Ozone Action's HCFC Help Centre website), the substantial approach would be:

- Establish penalties for intentional venting of HCFCs to the atmosphere,
- Make leak checking mandatory for equipment containing HCFCs (3 kg or more), establish a leakage checking schedule depending on equipment capacity and requiring installation of leak detectors for large capacity equipment,
- Make the recovery of HCFCs from containers (at the end of their life), from equipment (before final disassembling and during servicing or maintenance, if appropriate) and from products (if technically possible) mandatory.

The question arises as to which sectors should be covered by mandatory leak checking and mandatory recovery. Emission restrictions can be applied to all sectors where HCFCs are used. Some measures like leak checking requirements may only be applicable to specific sectors such as refrigeration and air conditioning. Another important question to be answered is who would be responsible for an emission if it occurs. Specifying that responsibility precisely in the country's legislation is absolutely necessary (see also item 7).

Another approach to limit HCFC emissions may be imposing bans or restrictions on the most emissive uses (solvents, aerosols, fire protection) – see "Specific phase-out schedules and use bans for HCFCs" option on page 24 for details. Such bans or restrictions may be introduced in parallel with measures described here.

2. Advantages / impacts / benefits

HCFC emission control measures would help in diminishing demand for HCFCs in the country. More HCFCs remaining in equipment means less HCFCs needed to refill the equipment and thus this will contribute to protecting the ozone layer and the climate. An additional benefit for the country would be the availability of certified personnel and companies (if the relevant support measure is implemented – see item 4).

3. Disadvantages / efforts / costs

Introducing the measures described under item 1 would require establishing the relevant legislation and require input by the competent authority. It would also require more effort not only from the companies and personnel involved in activities where the HCFCs are used, but also from the users of equipment containing HCFCs. There will also be some cost involved related to mandatory leak checks (this will vary in different countries depending on the labour cost), this cost will be borne by the equipment users (e.g. supermarkets, building owners).

4. Support measures required for effective implementation

Mandatory certification of personnel involved in relevant activities (installation, servicing or maintenance, leakage checking, recovery) would be an important support measure – as would certification of companies involved in these activities. Another support measure would be to establish standard leakage checking tests designed for specific types of equip-

19. The only exemption is emission from "process agent" uses which is limited for non-Article 5 countries by Table B contained in Decision X/14 of the Parties. So far no similar table for Article 5 countries has been proposed.

ment containing HCFCs (e.g. for stationary refrigeration and air conditioning equipment, for transport refrigeration and possibly also for fire protection systems if HCFCs are used there). Raising awareness of the relevant personnel and of the general public of the need to avoid emissions of HCFCs (see "Awareness raising of stakeholders" option on page 41.) would also be useful in achieving the objective of introducing emission control measures.

5. Criteria to define most suitable implementation schedule

Emission control is one of the measures that should be implemented as soon as possible once the political decision to do it is taken. If emission control of both HCFCs and HFCs has been decided, measures regarding HCFCs and HFCs can be implemented at the same time.

6. Criteria for decision making to implement / not to implement

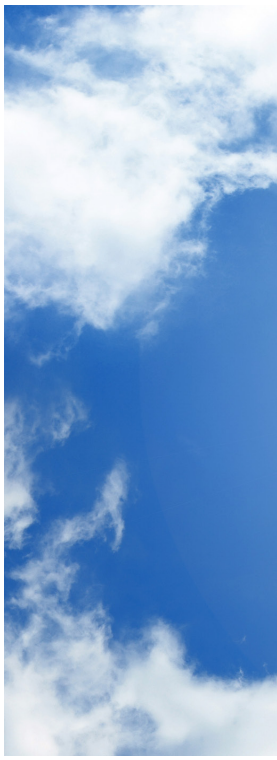
Since emission control is not directly required by the Montreal Protocol, Article 5 countries may consider the implementation of such measures depending on their level of ambition to protect the ozone layer and climate.

7. Status of implementation in selected countries

The Canadian Federal Halocarbon Regulations of 2003 includes strict emission control measures for all ODS, including HCFCs and also for HFCs. The current European Union (EU) legislation (Regulation 2037/2000) contains only a few elements related to ODS emission control, including mandatory recovery and annual leak checking of equipment containing more than 3 kg refrigerant as well as the requirement for the Member States to establish minimum qualification requirements for the personnel carrying out those activities. However, in the new ODS regulation much more attention has been given to emission control, e.g. the mandatory schedule for leak checking has been introduced. Similar measures concerning HFCs are contained in the EU Regulation 842/2006 on F-gases.

8. Links and resources

- Canada Federal Halocarbon Regulations 2003 available on www.ec.gc.ca/ceparegistry/documnents/regs/g2-13718_r1.pdf
- Regulation (EC) 2037/2000 of 29.06.2000 of the European Parliament and the Council on substances that deplete the ozone layer (OJ L 244, 29.9.2000), as last amended[20]
- Regulation (EC) 842/2006 of the European Parliament and the Council of 17 May 2006 on certain fluorinated greenhouse gases (OJ L 161 of 14.06.2006).
- Commission Regulations: 1497/2007, 1516/2007, and 303-306/2008 - dealing, respectively, with: requirements for leakage checking of stationary refrigeration, air conditioning and heat pump equipment, requirements for leakage checking of stationary fire protection systems, and certification of personnel and companies (or personnel only) in various sectors.
- UNEP DTIE OzonAction HCFC Help Centre: http://www.unep.fr/ozonaction/topics.hcfc.asp



20. Consolidated text of Regulation 2037/2008 dated January 2008 is available on http://eur-lex.europa.eu, recast Regulation 2037/2000 that has not yet been published will be mandatory starting from 1.01.2010.

Options related to capacity building

5

Training of customs and environmental officers

1. General description

Training programmes for customs and environmental officers conducted in Article 5 countries have focused mainly on the monitoring and control of CFCs, halons, carbon tetrachloride, 1.1.1-trichloroethane and methyl bromide since, until recently, no control measures applied to HCFCs in Article 5 countries. Once the phase-out schedule for HCFCs in Article 5 countries was accelerated in 2007, the situation changed and those countries are now not allowed to exceed their HCFC baseline consumption from 2013.

New training programmes need to be designed as part of HPMPs in order to train customs and environment officers on monitoring and control of HCFCs including detection of HCFC consignments at the border checkpoints. Customs officers need to be aware of the new HCFC-related requirements under the Montreal Protocol as well as national legislation, licensing system, quotas and bans related to HCFCs and HCFC-containing equipment/products. Many Article 5 countries started the process of adjusting national legislation according to the new Montreal Protocol provisions related to HCFCs and adopting relevant administrative, legal and institutional measures accordingly. Appropriate training of customs and environmental officers will ensure effective trade and border controls and prevent illegal trade of HCFC and HCFC-containing equipment/products and thus facilitate compliance with the Montreal Protocol..

Similar to previous training programmes, the HCFC-related training may consist of a train-the-customs-trainers programme and a subsequent train-the-customs-officers programme. The training sessions should include interactive discussions and working groups as well as practical exercises and case studies. Trained customs and environment officers who successfully passed the examination should be registered and receive participation certificates. Attempts to illegal trade HCFCs can be anticipated once legal trade of HCFCs is restricted. Lessons learned from CFC smuggling operations should provide much assistance. Second hand equipment may be exported ("dumped") from countries which no longer allow the use of HCFCs (virgin, reclaimed or recycled) or which are replacing HCFC-based manufacturing equipment, building chillers, etc.

2. Advantages / impacts / benefits

The availability of appropriately trained customs and environment officers is a pre-condition for effective control and monitoring of HCFC-related trade including products/equipment. Such training would also strengthen the links between enforcement bodies and environmental authorities.

3. Disadvantages / efforts / costs

The costs, efforts and time required to implement national training programmes are significant. However, the costs could either be born through self-financed training programmes of the customs administration or as part of HPMP implementation.

4. Support measures required for effective implementation

An important support measure would be publication of an up-dated manual for customs and environmental officers in national language

where all aspects of new legislation involving HCFCs will be covered. Other effective support measures include the organization of workshops for stakeholders directly involved in the process of HCFC phase-out, i.e. for importers, exporters, dealers and users of HCFCs – see also "Awareness raising of stakeholders" option on page 41 - or the participation in regional initiatives such as the informal Prior Informed Consent (iPIC) agreements - see UNEP DTIE "Guidelines for implementation of informal Prior Informed Consent (iPIC) procedure", the Regional Enforcement Networks or the Green Customs Initiative.

5. Criteria to define most suitable implementation schedule

The implementation of a national training programme is work and resource intensive and requires time. Therefore, the implementation of such training programmes could start as soon as funding (e.g. as part of HPMP implementation) and appropriate training materials are available. Practical hands-on session may require the purchase of refrigerant identifiers able to detect HCFCs. A significant number of customs and environmental officers should be trained before the introduction of trade restrictions which may coincide with the HCFC freeze in 2013 or earlier with a possible ban of new HCFC installations or HCFC use bans. Therefore, these training programmes should be initiated as soon as relevant national legislation is in place. Without legislation in place, the customs department should be kept informed through appropriate awareness raising activities – see "Awareness raising of stakeholders" option on page 41.

6. Criteria for decision making to implement / not to implement

If the country's competent authorities are sure that the process of enforcement of new legislation dealing with HCFCs would work well without refresher trainings, they may wish not to prioritise these. If the country's competent authorities are confident that the monitoring and control of HCFCs and HCFC-containing products/equipment and the enforcement of HCFC-related legislation, licensing system, quotas and bans were already covered by past training programmes, and that the current curricula of the customs training department fully covers these aspects, there may not be any need to set up a new training programme.

7. Status of implementation in selected countries

In the European Union, customs training that included HCFC-related issues has been conducted by individual Member States, specifically for customs officers from the customs houses and customs posts on the EU borders. Customs and environmental officers training manuals were developed in certain Member States. In the United States and Canada customs officers training which includes HCFCs is conducted on a regular basis. Article 5 countries customs training that would include HCFCs has not yet started, though it would usually be included in each country's HPMP.

In the second edition of UNEP's Customs Training Manual designed for Article 5 countries, HCFC-related issues have been addressed and therefore that manual can be used as a basis for developing similar manuals at the national level. UNEP DTIE OzonAction and the World Customs Organization will soon launch an on-line e-learning module for customs officers based on this updated manual.

8. Links and resources

- "Training Manual for Customs Officers (second edition) - Saving the Ozone Layer : Phasing out Ozone Depleting Substances in Developing Countries", "Guidelines for implementation of informal Prior Informed Consent (iPIC) procedure" and information on regional initiatives focused on preventing illegal trade in ODS, e.g. "Sky Hole Patching" project – available on http://www.unep.fr/ozonaction/topics/customs.htm
- Information on Green Customs Initiative – available on http://www.greencustoms.org

Training and certification of refrigeration technicians

1. General description

Training and certification of refrigeration technicians conducted in Article 5 countries has focused on containment of CFCs and retrofitting with HFCs and HCFCs as their primary replacement. Natural refrigerants (including ammonia, hydrocarbon, carbon dioxide) or low GWP HFCs were only presented at a general level since the focus of refrigerant management plans (RMPs) and terminal phase-out management plans (TPMPs) at the time was on CFC phase-out.

Once the HCFC phase-out schedule for Article 5 countries was accelerated in 2007, the situation changed and new training and certification programmes need to be designed as part of HCFC Phase-out Management Plans (HPMPs) in order to train refrigeration technicians on using alternative technologies as well as HCFC containment. Many Article 5 countries started the process of adjusting national legislation according to the new Montreal Protocol provisions related to HCFCs and adopting relevant administrative, legal and institutional measures accordingly. Appropriate training of refrigeration technicians will ensure the proper management of HCFC alternatives and HCFC containment and thus facilitate compliance with the Montreal Protocol. It is important that the sustainability of training results is ensured through inclusion of training courses on HCFC replacement technologies in the local training system curriculum and in technical school teaching programmes.

Similar to the previous training programmes conducted, the HCFC-related training may consist of a train-the-trainers programme and a subsequent train-the-technicians programme. In terms of technology choice to replace HCFCs, the energy efficiency and climate benefits of "natural" refrigerants and low- GWP HFCs should be taken into account compared with HCFCs and high-GWP HFCs. The national competent authorities in consultation with national stakeholders should decide whether there will be a general certificate covering all activities or several activity-specific certificates corresponding to different level of competence, e.g. as specified in the European Union (EU) regulation on F-gases (see item 7). With regard to the programme of training it should include both a theoretical and practical part and the examination at the end of the training should also consist of a theoretical and practical part. Trained technicians who have successfully passed the examination should be registered and receive a certificate. Similarly, it needs to be decided by the competent authorities whether only stationary or stationary and mobile equipment will be included in the training programmes.

2. Advantages / impacts / benefits

The availability of trained technicians is a precondition for the market introduction of new technologies including installation, servicing, repair, etc. and thus contributes to the sustainable development of the refrigeration and air-conditioning sector and enhances competitiveness.

3. Disadvantages / efforts / costs

The costs, efforts and time required to implement national training programmes and certification scheme are significant. However, the costs could either be born through self-financed training programmes of the technical training institutes or the national refrigeration and air-conditioning association or as part of HPMP implementation.

4. Support measures required for effective implementation

An important support measure would be publication of an updated manual for refrigeration technicians in the national/local language where all aspects of non-HCFC alternatives and HCFC containment will be described. A certification scheme for refrigeration technicians (and possibly also for servicing companies) will be required in case the training is mandatory (see item 7 below). Other effective support measures include the promotion of national refrigeration and air-conditioning associations, participation of national experts in international conferences and the organization of information workshops for users and owners of HCFCs-containing equipment.– see also "Awareness raising of stakeholders" option on page 58.

5. Criteria to define most suitable implementation schedule

The implementation of a national training programme and certification scheme is work and resource intensive and requires time. Therefore, the implementation of such training programmes could start as soon as funding (e.g. as part of HPMP implementation) and appropriate training materials are available. Practical hands-on sessions may require the purchase of training equipment including recovery and recycling devices. A significant number of technicians should be trained before the large-scale introduction of alternative technologies which may coincide with the ban of new HCFC installation or HCFC use bans. Since such bans could already be envisaged for the freeze years of 2009/2010, these training programmes should be initiated as early as possible.

6. Criteria for decision making to implement / not to implement

If the country's competent authorities are confident that the management of non-HCFC refrigerants and the containment of HCFCs was already covered by past training programmes, and that current curricula of the technical training institutes fully cover these aspects, there may not be any need to set up a new training programme.

7. Status of implementation in selected countries

In the United States, the EPA technician certification test has to be passed by technicians who deal with HCFCs refrigerants. In Australia, specific equipment-oriented certificates are required in order to receive a license to servicing equipment with HCFC or HFC refrigerants. In the European Union the EU ODS legislation requires that the relevant refrigeration technicians qualification programmes are developed by all Member States, so there are no uniform EU-wide personnel qualification requirements for HCFC refrigerants. However, the EU regulation on F-gases (Regulation 842/2006) requires not only certification of refrigeration technicians performing specific activities (leakage checking, recovery, installation and servicing or maintenance of stationary equipment), but also certification of companies performing installation and servicing or maintenance of that equipment. The relevant implementing act (EC Regulation 303/2008) contains detailed minimum requirements for certification including the detailed list of topics to be covered by such examination which consists of theoretical and practical part.

8. Links and resources

- USA legislation on ODS available on http://www.epa.gov.ozone/strathome.html
- Australia Ozone Protection and Synthetic Greenhouse Gas Regulations 2004 available on http://www.comlaw.gov.au/Comlaw/Legislation
- Regulation (EC) No 2037/2000 (EC) of the European Parliament and of the Council of 29 June 2000 on substances that deplete the ozone layer (OJ L 244, 29.9.2000), as last amended[21]
- Commission Regulation (EC)303/2008 of 2.04.2008 (on certification) (OJ L 92, 3.04.2008)
- Regulation (EC) 842/2006 of the EP and the Council of 17 May 2006 on certain fluorinated greenhouse gases (OJ L 161 0f 14.06.2006)

21. Consolidated version of Regulation (EC) 2037/2000 is available on http://eur-lex.europa.eu. Regulation 2037/2000 is planned to be replaced with the recast regulation on ODS starting from 1 January 2010.

Awareness-raising of stakeholders

1. General description

Awareness raising of stakeholders should be part of any HCFC phase-out strategy. The question is how it should be structured to achieve its goals at a minimum cost. The selection of the most appropriate approach depends on country specifics (size of the country, sectors where HCFCs are used, whether only major stakeholder groups are targeted or also the general public, technical schools, etc.) Since most Article 5 countries have already created public awareness as part of their CFC, methyl bromide and halon phase-out programmes, the awareness raising activities related to HCFCs phase-out may initially target the same specific stakeholder groups (i.e. importers, exporters, dealers, users, servicing companies, equipment owners and producers of HCFCs-containing products or equipment). These groups should be made aware of the accelerated HCFC phase-out schedule and any up-coming legislative policies in the country and their planned implementation schedule as well as of the available and emerging alternative technologies. Some stakeholders may be grouped together (e.g. importers, exporters and dealers, and might be addressed through similar awareness raising measures. The following instruments could be considered:

(1) Media releases including:
a.) Press releases - in the case of HCFCs these should be mainly sponsored articles in technical journals devoted to particular sectors, e.g. refrigeration, while articles in newspapers these could focus for example on the links between ozone layer and climate protection.
b.) TV spots – brief announcements could be considered in order to raise general public awareness or to change consumer behaviour.
c.) radio broadcasts – expert discussion could be considered in order to address particular stakeholder groups.

(2) Distribution of leaflets, posters and films – different leaflets could be designed for:
a.) importers, exporters and dealers
b.) servicing companies operating in refrigeration sector
c.) HCFC end users in each sector.

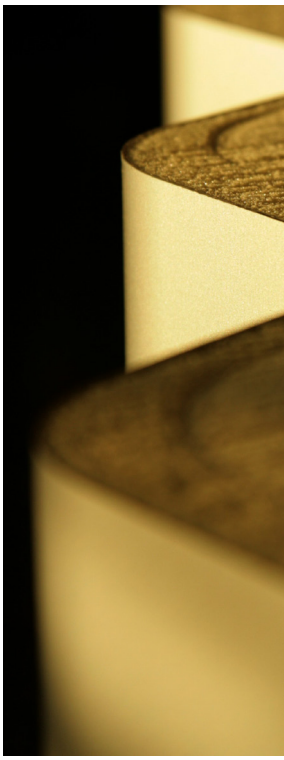
Posters promoting leakage control designed for equipment servicing workshops and the production of sector-oriented videos promoting new alternative technologies may be useful support measures.

(3) Organization of technical seminars or stakeholder consultations – those could be organized in the form of sponsored events, such as expert panel discussions in the presence of major stakeholders.

How is awareness raising to be organised and managed? If the National Ozone Unit is not in a position to conduct it, the Ministry of Environment may launch an official tender, based on a Terms of Reference for awareness raising activities. The selected local company would then be in charge of designing and managing the awareness raising activities. In such a case, it is recommended that an 'Information, Education and Communication Group' is established, that would review the proposed structure of the awareness raising activities, monitor their implementation and assess their impact.

2. Advantages / impacts / benefits

The advantage of launching the awareness raising activities targeting the major stakeholders will ensure they are provided information at an early stage and would encourage the involvement of stakeholders and increase stakeholder support. This will help reduce the growth curve in HCFC consumption and encourage key HCFC-using industries to get



involved in the HCFC Phase-out Management Plan (HPMP) process. Raising awareness of company owners will enable them to take informed investment decisions and contribute to an accelerated phase-out of HCFCs.

3. Disadvantages / efforts / costs

There are no disadvantages except that the costs of awareness raising need to be covered. Therefore, the implementation of awareness raising activities should be closely monitored e.g. through the establishment of an 'Information, Education and Communication Group' as proposed above. HCFC-related awareness raising activities in developing countries could be financed from the country's Institutional Strengthening project, HPMP or from private sector co-financing.

4. Support measures required for effective implementation

A useful support measure would be creation of a HCFC-related webpage – if possible as part of an existing Government or National Ozone Unit website or possibly as part of a website of national refrigeration and air-conditioning association (if applicable). This page should be linked from websites of the Ministry of Environment, Ministry of Economy, relevant technical journals, associations of stakeholders in particular sectors, technical universities etc. In particular, the national refrigeration association may support awareness raising activities and outreach to their members (see item 7 for the example of such a website created by the UK government).

5. Criteria to define most suitable implementation schedule

Relevant stakeholders should be informed at an early stage to ensure their involvement and support. They should be made aware of the advanced HCFC phase-out schedule and any up-coming policy and legislative measures in the country. Once legislation on HCFCs (and possibly also HFCs) has been adopted,

awareness raising activities should be intensified to reach out the message.

6. Criteria for decision making to implement / not to implement

If the country has made significant progress in HCFC phase-out and already established HCFC-related legislation, awareness raising activities may not be a priority. However, if policy and legislative measures have been introduced recently or are planned to be introduced in the future, such measures may be crucial.

7. Status of implementation in selected countries

In the United States, the main programme on raising awareness on alternatives to ODS (including HCFCs) is EPA's Significant New Alternatives Policy (SNAP) and findings of that program are made available to the general public on the US EPA webpage. There are also several partnership programmes with the industry, e.g. GreenChill Advanced Refrigeration Partnership, which promotes non-ODS and climate friendly technologies. In the UK, a Government-funded team called "F-gas support" was set up to provide guidance for manufacturers, operators, contractors and others that make, sell or handle ODS and HFCs and associated equipment, through a website that was specifically created for this purpose. In Article 5 countries, awareness raising related to HCFCs has not yet been started, though it can be planned in the HPMPs of individual countries. Useful information on alternatives to HCFCs can be found on the HCFC Help Centre website created by UNEP DTIE in the framework of Compliance Assistance Programme (CAP).

8. Links and resources

- Details of US EPA's SNAP programme can be found on: http://www.epa.gov/ozone/snap
- UNEP's HCFC Help Centre website: http://www.uneptie.org/ozonaction/topics/hcfc_excom.htm
- UK "F-gas support" website : http://www.defra.gov.uk/environment/air-atmos/fgas/about.htm

Glossary of Terms

Article 5 countries – developing countries falling under provisions of Article 5(1) of the Montreal Protocol. Have separate ODS phase-out schedules established under the Montreal protocol and are eligible for assistance from MLF.

ASHRAE – American Society of Heating, Refrigerating and Air-Conditioning Engineers.

CAP – Compliance Assistance Programme. UNEP OzonAction is among the implementing agencies of the Multilateral Fund, whereby assistance in phasing out ODS under the Montreal Protocol is provided to developing countries through a regional approach.

CAS number – Chemical Abstract Service number assigned to a particular chemical.

CFCs – chlorofluorocarbons – ozone depleting substances used commonly as refrigerants, blowing agents, solvents and aerosol propellants. Already phased out worldwide according to the Montreal Protocol phase-out schedules and replaced with HCFCs, HFCs and other alternatives, with few exempted uses still remaining. CFCs are also potent greenhouse gases.

CN – Combined Nomenclature – the system of classification of goods for customs purposes mandatory in the EU.

EU – The European Union – an economic and political union composed of 27 sovereign Member states located primarily in Europe.

F-GASES (fluorinated gases) – Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride(SF_6) are usually grouped together and called collectively fluorinated gases. HFCs, PFCs, SF_6 are synthetic, powerful greenhouse gases. These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases (High GWP gases).

GHS – Globally Harmonized System of Classification and Labelling of Chemicals.

Global Warming (climate change) - A phenomenon caused by emissions of greenhouse gases that trap the outgoing heat from the earth, causing the atmosphere to become warmer. Major greenhouse gases include carbon dioxide, nitrous oxide, methane, CFCs, HFCs, and HCFCs.

GWP – Global Warming Potential – a number indicating the level of direct global warming impact of a particular substance.

HCs – hydrocarbons – used commonly as alternatives to CFCs, HCFCs and HFCs.

HCFCs – hydrochlorofluorocarbons – ozone depleting substances of relatively low ODP that replaced CFCs in most applications. Now will be phased out following an accelerated phase out schedule established under the Montreal Protocol. HCFCs are potent greenhouse gases.

HFCs – hydrofluorocarbons – substances which do not deplete ozone layer, but are potent greenhouse gases included in the Kyoto protocol under UNFCCC Convention. Commonly used as replacements for CFCs and HCFCs.

HS code - Harmonized Commodity Description and Coding System - Multipurpose international product nomenclature developed by the World Customs Organization (WCO). It comprises about 5,000 commodity groups; each identified by a six-digit code, and is arranged in a legal and logical structure, supported by well-defined rules to achieve

uniform classification. The system is used by more than 200 countries and economies as a basis for their Customs tariffs and for the collection of international trade statistics.

MLF – Multilateral Fund for the Implementation of the Montreal protocol – A fund established under the Montreal Protocol for the purpose of assisting the Article 5 countries in phasing out ODS.

Montreal Protocol –the full name is "The Montreal Protocol for Substances that Deplete the Ozone Layer". The international treaty established in 1987 in the framework of Vienna Convention for the Protection of the Ozone Layer.

NOU – Organisation or agency that serves as the focal point for designing, monitoring and implementing the ODS phase-out Country Programme. Often, the NOU is located in the ministry of environment and may also serve as the licensing entity.

Ozone depletion - Process by which stratospheric ozone molecules are destroyed by man-made chemicals, leading to a reduction in their concentration.

ODP – Ozone Depletion Potential – a number indicating the level of ozone layer depletion by a particular substance.

ODS – Ozone Depleting Substances – substances that deplete the Earth's ozone layer. The ODS controlled under the Montreal protocol include: CFCs, halons, carbon tetrachloriode, methyl chloroform, HCFCs, HBFCs, methyl bromide, bromochloromethane.

PFCs – perfluorocarbons – substances which do not deplete ozone layer, but are potent greenhouse gases included in the Kyoto protocol under UNFCCC Convention. Sometimes used as replacements for CFCs and HCFCs.

Process agent - Controlled substances used in the production of other chemicals (such as a catalyst or an inhibitor of a chemical reaction) without being consumed as feedstock. Some uses of process agents are exempted under the Montreal Protocol. For further information, visit the Ozone Secretariat website, http://www.unep.org/ozone.

Reclaiming or reclamation - Re-processing and upgrading of a recovered controlled substance through mechanisms such as filtering, drying, distillation or chemical treatment in order to restore the substance to a specified standard of performance. Reclamation often involves processing off-site at a central facility.

Recovery - Collection and storage of controlled substances from machinery, equipment, containment vessels and such during servicing or prior to disposal.

Recycling - Re-use of a recovered controlled substance after a basic cleaning process such as filtering and drying. For refrigerants, recycling normally involves recharge back into equipment, and it often occurs on-site.

UN number – United Nations number assigned to a particular chemical.

Annex 1:

Decision XIX/6 of the Parties to the Montreal Protocol which established the accelerated HCFC phase-out schedule for Article 5 countries

Decision XIX/6 of the Parties to the Montreal Protocol which established the accelerated HCFC phase-out schedule for Article 5 countries

Decision XIX/6: Adjustments to the Montreal Protocol with regard to Annex C, Group I, substances (hydrochlorofluorocarbons)

The Parties agree to accelerate the phase-out of production and consumption of hydrochlorofluorocarbons (HCFCs), by way of an adjustment in accordance with paragraph 9 of Article 2 of the Montreal Protocol and as contained in annex III to the report of the Nineteenth Meeting of the Parties, on the basis of the following:

1. For Parties operating under paragraph 1 of Article 5 of the Protocol (Article 5 Parties), to choose as the baseline the average of the 2009 and 2010 levels of, respectively, consumption and production; and to freeze, at that baseline level, consumption and production in 2013;

2. For Parties operating under Article 2 of the Protocol (Article 2 Parties) to have completed the accelerated phase-out of production and consumption in 2020, on the basis of the following reduction steps:

(a) By 2010 of 75 per cent;
(b) By 2015 of 90 per cent;
(c) While allowing 0.5 per cent for servicing the period 2020–2030;

3. For Article 5 Parties to have completed the accelerated phase-out of production and consumption in 2030, on the basis of the following reduction steps:
(a) By 2015 of 10 per cent;
(b) By 2020 of 35 per cent;
(c) By 2025 of 67.5 per cent;
(d) While allowing for servicing an annual average of 2.5 per cent during the period 2030–2040;

4. To agree that the funding available through the Multilateral Fund for the Implementation of the Montreal Protocol in the upcoming replenishments shall be stable and sufficient to meet all agreed incremental costs to enable Article 5 Parties to comply with the accelerated phase-out schedule both for production and consumption sectors as set out above, and based on that understanding, to also direct the Executive Committee of the Multilateral Fund to make the necessary changes to the eligibility criteria related to the post-1995 facilities and second conversions;

5. To direct the Executive Committee, in providing technical and financial assistance, to pay particular attention to Article 5 Parties with low volume and very low volume consumption of HCFCs;

6. To direct the Executive Committee to assist Parties in preparing their phase-out management plans for an accelerated HCFC phase-out;

7. To direct the Executive Committee, as a matter of priority, to assist Article 5 Parties in conducting surveys to improve reliability in establishing their baseline data on HCFCs;

8. To encourage Parties to promote the

selection of alternatives to HCFCs that minimize environmental impacts, in particular impacts on climate, as well as meeting other health, safety and economic considerations;

9. To request Parties to report regularly on their implementation of paragraph 7 of Article 2F of the Protocol;

10. To agree that the Executive Committee, when developing and applying funding criteria for projects and programmes, and taking into account paragraph 6, give priority to cost-effective projects and programmes which focus on, inter alia:

(a) Phasing-out first those HCFCs with higher ozone-depleting potential, taking into account national circumstances;
(b) Substitutes and alternatives that minimize other impacts on the environment, including on the climate, taking into account global-warming potential, energy use and other relevant factors;
(c) Small and medium-size enterprises;

11. To agree to address the possibilities or need for essential use exemptions, no later than 2015 where this relates to Article 2 Parties, and no later than 2020 where this relates to Article 5 Parties;

12. To agree to review in 2015 the need for the 0.5 per cent for servicing provided for in paragraph 3, and to review in 2025 the need for the annual average of 2.5 per cent for servicing provided for in paragraph 4 (d);

13. In order to satisfy basic domestic needs, to agree to allow for up to 10% of baseline levels until 2020, and, for the period after that, to consider no later than 2015 further reductions of production for basic domestic needs;

14. In accelerating the HCFC phase-out, to agree that Parties are to take every practicable step consistent with Multilateral Fund programmes, to ensure that the best available and environmentally-safe substitutes and related technologies are transferred from Article 2 Parties to Article 5 Parties under fair and most favourable conditions.

Annex 2:
List of all controlled HCFCs

Substance	ASHRAE Code	Chemical name	Chemical formula	Ozone Depletion Potential*	Global Warming Potential	Lifetime (years)
HCFC-21**	R-21	Dichlorofluoromethane	$CHFCl_2$	0.04	151	1.7
HCFC-22**	R-22	Monochlorodifluoromethane	CHF_2Cl	0.055	1810	12.0
HCFC-31	R-31	Monochlorofluoromethane	CH_2FCl	0.02		
HCFC-121	R-121	Tetrachlorofluoroethane	C_2HFCl_4	0.01-0.04		
HCFC-122	R-122	Trichlorodifluoroethane	$C_2HF_2Cl_3$	0.02-0.08		
HCFC-123**	R-123	Dichlorotrifluoroethane	$C_2HF_3Cl_2$	0.02-0.06	77	1.3
HCFC-124**	R-124	Monochlorotetrafluoroethane	C_2HF_4Cl	0.02-0.04	609	5.8
HCFC-131	R-131	Trichlorofluoroethane	$C_2H_2FCl_3$	0.007-0.05		
HCFC-132	R-132	Dichlorodifluoroethane	$C_2H_2F_2Cl_2$	0.008-0.05		
HCFC-133	R-133	Chlorotrifluoroethane	$C_2H_2F_3Cl$	0.02-0.06		
HCFC-141	R-141	Dichlorofluoroethane	$C_2H_3FCl_2$	0.005-0.07		
HCFC-141b**	R-141b	Dichlorofluoroethane	CH_3CFCl_2	0.11	725	9.3
HCFC-142	R-142	Chlorodifluoroethane	$C_2H_3F_2Cl$	0.008-0.07		
HCFC-142b**	R-142b	Chlorodifluoroethane	CH_3CF_2Cl	0.065	2310	17.9
HCFC-151	R-151	Chlorofluoroethane	C_2H_4FCl	0.003-0.005		
HCFC-221	R-221	Hexachlorofluoropropane	C_3HFCl_6	0.015-0.07		
HCFC-222	R-222	Pentachlorodifluoropropane	$C_3HF_2Cl_5$	0.01-0.09		
HCFC-223	R-223	Tetrachlorotrifluoropropane	$C_3HF_3Cl_4$	0.01-0.08		
HCFC-224	R-224	Trichlorotetrafluoropropane	$C_3HF_4Cl_3$	0.01-0.09		
HCFC-225	R-225	Dichloropentafluoropropane	$C_3HF_5Cl_2$	0.02-0.07		
HCFC-225ca**	R-225ca	Dichloropentafluoropropane	$CF_3CF_2CHCl_2$	0.025	122	1.9

HCFC-225cb**	R-225cb	Dichloropentafluoropropane	CF_2ClCF_2CHClF	0.033	595	5.8
HCFC-226	R-226	Monochlorohexafluoropropane	C_3HF_6Cl	0.02-0.10		
HCFC-231	R-231	Pentachlorofluoropropane	$C_3H_2FCl_5$	0.05-0.09		
HCFC-232	R-232	Tetrachlorodifluoropropane	$C_3H_2F_2Cl_4$	0.008-0.10		
HCFC-233	R-233	Trichlorotrifluoropropane	$C_3H_2F_3Cl_3$	0.007-0.23		
HCFC-234	R-234	Dichlorotetrafluoropropane	$C_3H_2F_4Cl_2$	0.01-0.28		
HCFC-235	R-235	Monochloropentafluoropropane	$C_3H_2F_5Cl$	0.03-0.52		
HCFC-241	R-241	Tetrachlorofluoropropane	$C_3H_3FCl_4$	0.004-0.09		
HCFC-242	R-242	Trichlorodifluoropropane	$C_3H_3F_2Cl_3$	0.005-0.13		
HCFC-243	R-243	Dichlorotrifluoropropane	$C_3H_3F_3Cl_2$	0.007-0.12		
HCFC-244	R-244	Monochlorotetrafluoropropane	$C_3H_3F_4Cl$	0.009-0.14		
HCFC-251	R-251	Monochlorotetrafluoropropane	$C_3H_4FCl_3$	0.001-0.01		
HCFC-252	R-252	Dichlorodifluoropropane	$C_3H_4F_2Cl_2$	0.005-0.04		
HCFC-253	R-253	Monochlorotrifluoropropane	$C_3H_4F_3Cl$	0.003-0.03		
HCFC-261	R-261	Dichlorofluoropropane	$C_3H_5FCl_2$	0.002-0.02		
HCFC-262	R-262	Monochlorodifluoropropane	$C_3H_5F_2Cl$	0.002-0.02		
HCFC-271	R-271	Monochlorofluoropropane	C_3H_6FCl	0.001-0.03		

* Where a range of ODPs is indicated, the highest value in that range shall be used for the purposes of the Protocol. The ODPs listed as a single value have been determined from calculations based on laboratory measurements. Those listed as a range are based on estimates and are less certain. The range pertains to an isomeric group. The upper value is the estimate of the ODP of the isomer with the highest ODP, and the lower value is the estimate of the ODP of the isomer with the lowest ODP.

** Identifies the most commercially viable substances with ODP values listed against them to be used for the purposes of the Protocol.
Source: ODP values - Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer Seventh edition (2006), Ozone Secretariat, " Annex C, Controlled Substances". GWP values, WMO (World Meteorological Organization), Scientific Assessment of Ozone Depletion: 2006, Global Ozone Research and Monitoring Project—Report No. 50. GWP values represent direct radiative forcing using a 100 year time horizon. Atmospheric lifetime values, WMO Scientific Assessment of Ozone Depletion: 2006, Global Ozone Research and Monitoring Project—Report No. 50.

Annex 3:
List of most commonly used mixtures containing HCFCs

Commonly used name (ASHRAE code)	Composition (by type of substance)	Composition (by ASHRAE code of substance)	Composition (by weight %)	ODP	GWP (100 years)
R-401A	HCFC/HFC/HCFC	R-22/152a/124	(53/13/34)	0.033	1200
R-401B	HCFC/HFC/HCFC	R-22/152a/124	(61/11/28)	0.036	1300
R-401C	HCFC/HFC/HCFC	R-22/152a/124	(33/15/52)	0.027	930
R-402A	HFC/HC/HCFC	R-125/290/22	(60/2/38)	0.019	2800
R-402B	HFC/HC/HCFC	R-125/290/22	(38/2/60)	0.030	2400
R-403A	HC/HCFC/PFC	R-290/22/218	(5/75/20)	0.038	3100
R-403B	HC/HCFC/PFC	R-290/22/218	(5/56/39)	0.028	4500
R-406A	HCFC/HC	R-22/600a/142b	(55/4/41)	0.056	1900
R-408A	HCFC/HFC/HCFC	R-125/143a/22	(7/46/47)	0.024	3200
R-409A	HCFC/HCFC/HCFC	R-22/124/142b	(60/25/15)	0.046	1600
R-409B	HCFC/HCFC/HCFC	R-22/124/142b	(65/25/10)	0.045	1600
R-411A	HC/HCFC/HFC	R-1270/22/152a	(3/94/3)	0.044	1600
R-411B	HC/HCFC/HFC	R-1270/22/152a	3/94/3	0.047	1700
R-412A	HCFC/PFC/HCFC	R-22/218/142b	70/5/25	0.053	2300
R-414A	HCFC/HCFC/HC/HCFC	R-22/124/600a/142b	(51.0/28.5/4.0/16.5)	0,.043	1500
R-414B	HCFC/HCFC/HC/HCFC	R-22/124/600a/142b	(50,0/39,0/1,5/9,5)	0.039	1400
R-415A	HCFC/HFC	R-22/152a	(82,0/18,0)	0.041	550
R-416A	HFC/HCFC/HC	R-134a/124/600	(59,0/39,5/1,5)	0.008	1100
R-418A	HC/HCFC/HFC	R-290/22/152a	(1,5/96,0/2,5)	0.048	1700

Source: ODP and GWP values from 2006 UNEP Technical Options Committee Refrigeration, Air Conditioning and Heat Pumps Assessment Report, pp 32-34; ANSI/ASHRAE 34-2007, Designation and Safety Classification of Refrigerants.

About the UNEP Division of Technology, Industry and Economics

The UNEP Division of Technology, Industry and Economics (DTIE) helps governments, local authorities and decision-makers in business and industry to develop and implement policies and practices focusing on sustainable development.

The Division works to promote:

> sustainable consumption and production,
> the efficient use of renewable energy,
> adequate management of chemicals,
> the integration of environmental costs in development policies.

The Office of the Director, located in Paris, coordinates activities through:

- **The International Environmental Technology Centre** - IETC (Osaka, Shiga), which implements integrated waste, water and disaster management programmes, focusing in particular on Asia.
- **Sustainable Consumption and Production** (Paris), which promotes sustainable consumption and production patterns as a contribution to human development through global markets.
- **Chemicals** (Geneva), which catalyzes global actions to bring about the sound management of chemicals and the improvement of chemical safety worldwide.
- **Energy** (Paris), which fosters energy and transport policies for sustainable development and encourages investment in renewable energy and energy efficiency.
- **OzonAction** (Paris), which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition to ensure implementation of the Montreal Protocol.
- **Economics and Trade** (Geneva), which helps countries to integrate environmental considerations into economic and trade policies, and works with the finance sector to incorporate sustainable development policies.

UNEP DTIE activities focus on raising awareness, improving the transfer of knowledge and information, fostering technological cooperation and partnerships, and implementing international conventions and agreements.

For more information,
see **www.unep.fr**

Hydrochlorofluorocarbons (HCFCs) - chemicals widely used in air conditioning, refrigeration, foam manufacturing and other applications - are controlled under the Montreal Protocol because of their potential to destroy the Earth's stratospheric ozone layer. HCFCs are also potent greenhouse gases that contribute to climate change. Recognising this, in September 2007, the Parties to the Protocol adopted an accelerated HCFC phase out schedule under which developing countries must freeze their HCFC production and consumption by 2013 and then phase them out in a stepwise manner starting in 2015.

This publication provides National Ozone Units and policy makers in developing countries with guidance on different policy options to control, monitor and reduce HCFC consumption in order to comply with these obligations.
A description of each option is given as well as the advantages, disadvantages, impacts, benefits, cost and the efforts entailing the selection of such an option.
This document is designed to support the development and implementation of national HCFC Phase-out Management Plans under the Protocol's Multilateral Fund.

www.unep.org

United Nations Environment Programme
P.O. Box 30552 Nairobi, Kenya
Tel.: +254-(0)20-762 1234
Fax: +254-(0)20-762 3927
E-mail: uneppub@unep.org

UNEP

For more information, contact:
UNEP DTIE
Ozonaction
15 rue de Milan
75441 Paris CEDEX 09
France
Tel: +33 1 4437 1450
Fax: +33 1 4437 1474
E-mail: uneptie@unep.fr
www.unep.fr/ozonaction

ISBN: 978-92-807-3078-4
DTI/1256/PA