



Legislative and Policy Options to Control Hydrofluorocarbons





Legislative and Policy Options to Control Hydrofluorocarbons



Acknowledgements

This document was produced by the UN Environment, Economy Division, OzonAction as part of UN Environment's work programme under the Multilateral Fund for the Implementation of the Montreal Protocol.

The project was managed by the following team in the UN Environment OzonAction:

Dr. Shamila Nair-Bedouelle, Head
Ms. Anne-Maria Fenner, Information Manager

Researched and written by:

Mr. Janusz Kozakiewicz, Poland

Quality reviewed by:

Mr. Atul Bagai, OzonAction
Ms. Donnalyne Charles, OzonAction
Mr. James S. Curlin, OzonAction
Mr. Ruperto de Jesus, OzonAction
Ms. Sonja Wagner, OzonAction

Layout and design by: Ms. Anna Mortreux

Cover Images: © Ezra Clark
© Nasa/Shutterstock; © Somrerk Witthayanant/Shutterstock; © Egyptian Studio/Shutterstock;
© Anton Ivanov/Shutterstock; © Leotie/Shutterstock; © Nuamfolio/Shutterstock;
© Evgeny Bendin/Shutterstock; © Karl Ahnee/Shutterstock; © Anton Ivanov/Shutterstock

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.







UN Environment promotes environmentally sound practices globally and in its own activities. This publication is printed on 100% recycled paper, using vegetable-based inks and other eco-friendly practices. Our distribution policy aims to reduce UN Environment's carbon footprint.

EXECUTIVE SUMMARY

UN Environment OzonAction is assisting all developing countries (Article 5 under the Montreal Protocol) through its networks of National Ozone Officers (146 developing countries), clearinghouse and capacity-building activities to implement their national hydrochlorofluorocarbons (HCFC) phase-out. OzonAction supports efforts to phase out HCFCs, adopt non-ozone depleting, non global warming and energy-efficient alternatives in a safe and sustainable manner, ultimately protecting our common global property –the Earth's ozone layer.

The most commonly used alternatives to HCFCs are hydrofluorocarbons (HFCs). These substances belong to the so-called "Kyoto Protocol basket of greenhouse gases". They have a high global warming potential (GWP), but do not deplete the ozone layer, so they are commonly used as substitutes for ozone depleting substances (ODS), especially for HCFCs. Since based on the provisions of the Montreal Protocol (MP), the global consumption and production of the HCFCs is currently being phased out - the HFCs are being phased in. It is estimated that in 2015 a minimum 525,000 metric tons of these substances were produced and consumed globally. If this trend is not stopped the HFCs will become major (6-9 %) contributors to climate change by 2050. Taking this threat into account the Parties to the Montreal Protocol endorsed in October 2016 the so-called "Kigali Amendment" which introduced to the MP the controls on consumption and production of HFCs.

In order to follow and facilitate the HFC phase-down schedules contained in the Kigali Amendment, the Parties, including both developed and developing countries, will have to implement certain measures. This booklet contains a recommended set of legislative and policy options which the developing (Article 5) countries may wish to consider for implementation. It is intended to be a guide/tool for countries. It complements the previous publication "HCFC Policy & Legislative Options: A Guide for Developing Countries"(2010)¹.

-  **Chapter 1** – describes the interlinkages and relationship between HCFC phase-out and HFC phase-down. In the next chapters the options are grouped according to their functions which can be easily recognised by function-specific pictograms.
-  **Chapter 2** – deals with options related to monitoring and controlling the trade in HFCs such as import quotas and exemption from quotas, mandatory reporting by HFC importers and exporters as well as different types of bans and restrictions concerning HFCs and products and equipment containing or relying on HFCs.
-  **Chapter 3** – describes the possibility of introducing specific HFC phase-down schedules and bans that would restrict the use of HFCs, including a ban on new HFC installations.
-  **Chapter 4** – contains options related to record keeping on HFCs and HFC-containing products and equipment, namely the establishment of HFC substance logbooks and HFC equipment logbooks.
-  **Chapter 5** – explains the HFC emission control measures such as mandatory leakage checks that can be introduced in order to diminish HFC emissions and thus reduce the demand for servicing of equipment containing or relying on HFCs.
-  **Chapter 6** – provides recommendations related to awareness raising among stakeholders and capacity building in the context of HFC phase-down, including the issue of the training of customs and environmental officers and the training and certification of refrigeration technicians.

¹ <http://www.unep.fr/ozonaction/information/mmcfiles/7434-e-hcfc-policy.pdf>

Each section devoted to a specific option contains a general description of that option as well as the advantages and disadvantages of its implementation, criteria for the relevant decision-making and the selection of the appropriate timing, support measures which can be introduced to make the implementation more effective, status of implementation in certain countries and linkages to the related references.

The options are also color-coded to indicate the suggested timing for implementation: orange - implementation to accompany ratification of the Kigali Amendment, blue - implementation before the freeze date and green - implementation at a later stage of the HFC phase-down process. The recommended schedule of implementation of each option in Group 2 Article 5 countries (GCC states, India, Iran, Iraq and Pakistan) and Group 1 Article 5 countries (all other Article 5 countries) is contained in the "Conclusions" chapter. The options to be implemented as quickly as possible after the data on HFC consumption in the country are available from a national HFC inventory (so that the general strategy for HFC phase-down can be developed) include: starting the process of awareness raising among stakeholders, introducing the emission control measures and mandatory reporting by HFC importers and exporters. It is recommended that the establishment of national annual import quotas for HFCs and the introduction of some restrictions on the placing on the market of products and equipment containing HFCs, as well as the training of customs officers and refrigeration technicians on HFCs, could be the next steps for implementation.

Annexes to the booklet contain the full text of the Kigali Amendment and related decisions of the Parties, HFC phase-down schedules mandatory for Article 5 and non-Article 5 countries, HFC equipment logbook, recommended customs codes and classification of HFCs and other fluorinated gases and HFC-containing RAC&HP equipment.

OzonAction will continue to work with countries and provide the necessary technical assistance to implement the "enabling activities" identified in the Kigali Amendment for a smooth transition to an HFC phase-down, recognising that there is no "one-size-fits-all".

TABLE OF CONTENTS

Executive Summary	3
Table of Contents	5
Introduction	7
1. HCFC phase-out and HFC phase-down interlinkages and relationship	11
2. Options related to monitoring and controlling trade	15
2.1 Import quotas for HFCs	15
2.2 Exemptions from HFC import quotas	20
2.3 Mandatory reporting by HFC importers and exporters	23
2.4 Labeling of HFC containers	26
2.5 Ban on non-refillable HFC containers	29
2.6 Restrictions on placing on the market of products /equipment containing or relying on HFC	31
2.7 Permits for HFC transit	34
2.8 Permits for each HFC shipment	36
2.9 Requirement for proof of origin for HFC shipment	38
2.10 Fees for HFC imports / placing on the market	40
2.11 Electronically operated licensing system for HFCs	43
3. Options related to restrictions on HFC use	47
3.1 Specific phase-down schedules and use bans for HFCs	47
3.2 Ban on new HFC installations	50
4. Options related to record keeping	53
4.1 Mandatory HFC logbooks	53
4.2 Mandatory HFC equipment logbooks	57
5. Options related to preventing HFC emissions	63
5.1 HFC emission control measures	63
6. Options related to capacity building and awareness raising	67
6.1 Training of customs and environmental officers	67
6.2 Training and certification of refrigeration technicians	70
6.3 Awareness raising of stakeholders	73
Conclusions	76
Annexes	79



INTRODUCTION

This booklet presents different options that National Ozone Units may consider for controlling and phasing down consumption of hydrofluorocarbons (HFCs) in a smooth and efficient manner. Action towards monitoring and control of HFCs needs to be initiated in each country as soon as possible, taking into account the rapid growth of HFC use over the last decade and the significant impact of HFCs on climate change (see Chapter 1 for details). It is recommended that such action accompanies the ratification of the Kigali Amendment to the Montreal Protocol (MP) because it will facilitate meeting the HFC phase-down regime in the future. An early introduction of policies which will aim at diminishing HFC consumption will also allow for quicker penetration on a local market of new alternative technologies which are environmentally friendly and in many cases more energy efficient. Decision makers in developing countries may wish to select one or more policy options for implementation, depending on the current level of HFC consumption and its projected growth over the next few years in the absence of any measures taken.

The options are grouped into five categories:

- 01 TRADE MONITORING AND CONTROL**
- 02 RESTRICTIONS ON USE**
- 03 RECORD KEEPING**
- 04 EMISSION PREVENTION**
- 05 CAPACITY BUILDING AND AWARENESS RAISING**

The options are color coded for easy identification:

ORANGE

RECOMMENDED FOR IMPLEMENTATION² TO ACCOMPANY RATIFICATION OF THE KIGALI AMENDMENT

Some measures really require immediate implementation showed the country intend to ratify the Kigali Amendment within the next few years. The document published by the Ozone Secretariat in February 2017 entitled "Briefing Note on Ratification of the Kigali Amendment"³ will help the country to prepare for ratification. The first step is amending the ODS legislation as soon as possible to include HFCs as controlled substances, or drafting a separate HFC legislation (the latter option is more time consuming, but may be selected if the country is well advanced in HCFC phase-out). The HFC legislation will have to include as the minimum the list of controlled HFCs and their customs codes, the HFC phase-down schedule, data reporting provisions as well as the structure and operation scheme of import and export licensing systems. Optionally, the provisions related to the options contained in this booklet and/or other measures that will facilitate HFC phase-down and that the country will decide to implement. It is recommended that the HFC legislation includes all the options that the country decides to implement either quickly or at a later time. If this approach is taken, the dates each of the options will enter into force may be established in the legislation, so further revisions will be limited to a minimum.

The options recommended for implementation to accompany ratification of the Kigali Amendment include (a) mandatory reporting by HFC importers and exporters which would prepare the grounds for future reporting to the Ozone Secretariat under Article 7 of the MP; (b) establishing the HFC licensing system which is mandatory under the Kigali Amendment; (c) HFC emission control measures (e.g. mandatory leakage checks for selected types of equipment containing HFCs) which would reduce emissions and therefore also diminish demand for HFCs. Early start of the awareness raising campaign that would inform the endusers about HFC phase-down process and global and local benefits would also help much in convincing the stakeholders that ratification of the Kigali Amendment is important.

BLUE

RECOMMENDED FOR IMPLEMENTATION BEFORE FREEZE DATE OR AT LEAST BEFORE THE DATE OF THE FIRST PHASE-DOWN STEP

Quick implementation means undertaking the relevant action at governmental level as soon as possible, but preferably before the HFC consumption freeze date defined for the country concerned. Options recommended for quick implementation include first of all the establishment of HFC annual quotas which would help to follow the HFC phase-down regime and avoid non-compliance, and the introduction of restrictions on placing on the market products and equipment containing or relying on HFCs which would prevent dumping the used HFC equipment and thus prevent the increase of HFC demand for servicing.

GREEN

RECOMMENDED FOR FUTURE IMPLEMENTATION

The country may prefer to implement options after the Kigali Amendment enters into force for the country concerned than before that date, though obviously, it is to be decided by the relevant government when to do it. Examples of options for future implementation are the introduction of permits for each HFC shipment, the establishment of fees for HFC imports or banning non-refillable HFC containers.

² Implementation is understood here as developing, establishing and enforcing the relevant legislation.

³ This document is available at : <http://conf.montreal-protocol.org/meeting/oewg/oewg-39/presession/SitePages/Home.aspx>



The options presented do not include the most substantial measure, i.e. establishing a licensing system for the import and export of HFCs (including mixtures containing HFCs) since it is understood that all Article 5 countries already have operational licensing systems for HFCs, and those systems can be extended in the future to include HFCs. This booklet also does not contain specific enforcement-related complementary measures such as the informal Prior Informed Consent (iPIC) procedure,⁴ although references to iPIC are made in relation to monitoring and control of trade in HCFCs. The important issue of taking into account the energy-efficiency aspect⁵ when selecting the appropriate HFC phase-down policy has also not been addressed in this booklet since its complexity, it deserves a separate publication and the discussion is still ongoing on the way this issue can be approached by the Parties in the context of the Kigali Amendment.

This booklet contains an introductory chapter presenting the differences and similarities between the HCFC *phase-out* and HFC *phase-down*, especially the differences in calculating consumption. The important issues of differentiation between phase-down schedules for different groups of countries and certain potential exemptions from those schedules are also addressed in this booklet.

Each chapter follows the same structure:

- (1)  **General description**
- (2)  **Advantages / impacts / benefits**
- (3)  **Disadvantages / efforts / costs**
- (4)  **Support measures required for effective implementation**
- (5)  **Criteria to define the 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**

In the Conclusions the recommended timeline of implementation of specific options by Group 1 and Group 2 countries is included.

The annexes include the full text of the Kigali Amendment and the related Decision XXVIII/2 of the Parties to the Montreal Protocol, the HFC phase-down schedules agreed by the Parties in Kigali, HFC equipment logbook, information on possible options for national customs classifications of HFCs, HFC-containing mixtures and products and equipment containing HFCs.

⁴ Information on iPIC procedure can be found on <http://www.unep.org/ozonaction/resources/informal-prior-informed-consent-mechanism>

⁵ See UN Environment OzonAction Factsheet: "Energy Efficiency in the Refrigeration and Air Conditioning (RAC) Sector", http://conf.montreal-protocol.org/meeting/mop/mop-28/publications/Observer%20Publications/Energy%20Efficiency%20in%20Refrigeration%20and%20Air%20Conditioning%20Sector_v04_A4_web.pdf





1. HCFC PHASE-OUT AND HFC PHASE-DOWN INTERLINKAGES AND RELATIONSHIP

Hydrochlorofluorocarbons (HCFCs) are ozone depleting substances (ODS) controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer. Both production and consumption of HCFCs (defined as production + imports – exports) are to be phased out by 1 January 2020 in developed countries and by 1 January 2030 in developing countries following the specified reduction schedules. Additionally, 0.5 % and 2.5 % of base years consumption is allowed for servicing the refrigeration and air conditioning equipment existing at the phase-out date in developed and developing countries, respectively, until 31 December 2030 and 31 December 2040. Although HCFCs have their ozone depletion potentials (ODPs) in the range of 0.01-0.52, i.e. very low as compared to ODPs of chlorofluorocarbons (CFCs) which were replaced by HCFCs, their overall effect on ozone layer depletion is quite high because of the large quantities which are still consumed globally. Based on Article 7 data reported to the Ozone Secretariat, an estimated 26,000 ODP tons⁶ of HCFCs were consumed in 2015 in 156 countries out of 167 countries that supplied data, which corresponds to approximately 433,000 metric tons,⁷ (about 40% less than the amount consumed in 2010). The reason for such a sharp decline in the global HCFC consumption over the last 5 years is that, in spite of the long time remaining until the 100% phase out deadline, many countries decided to accelerate the process of reducing HCFC consumption significantly and some (like e.g. European Union Member States, Norway or Switzerland) have already completed the HCFC phase-out process. It should be noted that such great progress in the phase-out of HCFC global consumption could not be possible without financial support provided to developing countries by the Montreal Protocol's Multilateral Fund.

While the global HCFC phase-out process is progressing, the most common alternatives to HCFCs that have zero ODP values – hydrofluorocarbons (HFCs), unsaturated HFCs (HFOs), hydrocarbons (HCs), ammonia or CO₂ – are gradually being phased in. Due to their specific features like non-flammability, chemical inertness, relatively low cost and excellent performance as refrigerants, foam blowing agents, aerosol propellants or solvents, HFCs have become the major replacements for HCFCs over the last decade. In 2015, an estimated 525,000 metric tons of HFCs were produced and consumed globally. However, the great disadvantage of HFCs is that the most commonly-used HFC substances and blends are powerful greenhouse gases which have very high global warming potentials (GWPs), several thousand times greater than the GWP of CO₂.

6 For particular ODS substance or mixture: 1 ODP ton = 1 metric ton multiplied by the ODP value of the substance or mixture. In the calculation of metric tons value a default ODP for HCFC equal to 0.06 was taken supposing that main HCFC used was HCFC-22 of ODP = 0.055 while some minor quantities of HCFC-141b of ODP = 0.11 and also some relatively small quantities of other HCFCs of various ODP values were also produced and consumed.

7 In addition, ca. 600,000 metric tons of HCFCs were used for feedstock and therefore were not counted in total consumption figures.

Fig. 1 Global phase out of HCFC consumption (dark blue bars) and growth of HFC consumption (red bars) in developed (non-Article 5) countries over the last 10-year period. The HCFC figures are based on Ozone Secretariat data and the HFC figures are based on TEAP estimations (TEAP TF XXVII-4 Report, 2016). All figures expressed in metric tons.

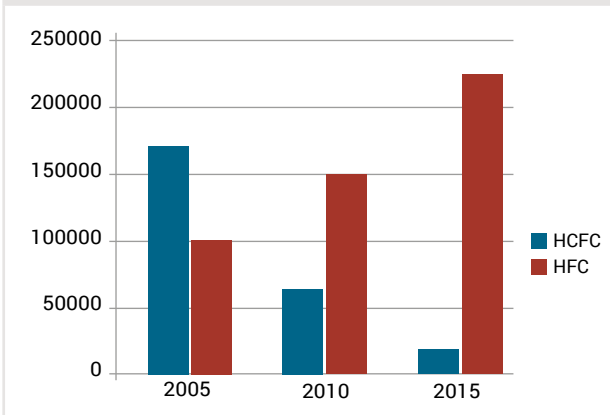
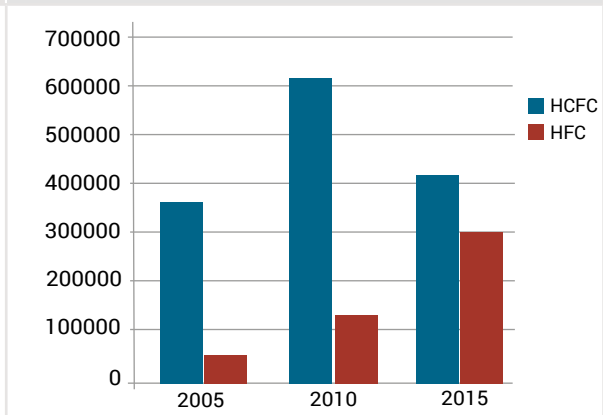


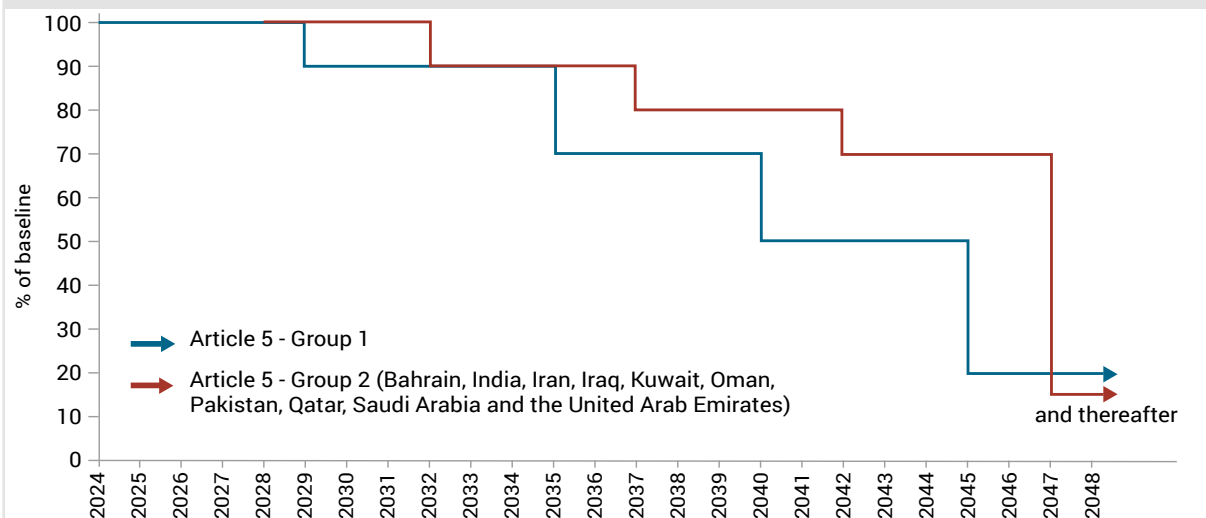
Fig. 2 Global phase out of HCFC consumption (dark blue bars) and growth of HFC consumption (red bars) in developing (Article 5) countries over the last 10-year period. The HCFC figures are based on Ozone Secretariat data and the HFC figures are based on TEAP estimations (TEAP TF XXVII-4 Report, 2016). All figures expressed in metric tons.



As can be seen in Figures 1 and 2, there has been a significant increase in the global market penetration of HFCs and a simultaneous decrease in HCFC consumption over last decade. Based on scientific estimates HFCs will become major (6-9 %) contributors to climate change by 2050 if no action is taken to stop their production and consumption growth.⁸ It can also be noted from the two figures that the dynamics of HFC growth in both developed and developing countries was quite significant over the last decade, so it could be expected that without prompt action by the Montreal Protocol Parties that trend would continue.

Accordingly, the Parties to the Montreal Protocol agreed in October 2016 the Kigali Amendment⁹ which extended the list of controlled substances to include 18 HFCs (see Annex 1). The Amendment also established phase-down schedules for HFC production and consumption (defined as production + imports – exports of HFCs expressed in CO₂ equivalents) (see Annex 2). The Parties decided that there will be two different phase-down schedules established for two groups of Article 5 Parties: Group 1 – countries which will follow the more ambitious HFC phase-down timeline and Group 2 – countries which, due to specific national circumstances will follow a different schedule. These two schedules are represented graphically in Fig. 3.

Fig. 3. HFC phase down schedules for Article 5 Group 1 and Group 2 countries as established by the Kigali Amendment¹⁰



⁸ G.J.M. Velders et al., Atmospheric Environment Part A, 2015, 123, 200-209, <http://www.sciencedirect.com/science/article/pii/S135223101530488X>

⁹ UN Environment Ozonaction Factsheet : "The Kigali Amendment to the Montreal Protocol - HFC Phase-down", http://www.unep.fr/ozonaction/information/mmcfiles/7809-e-Factsheet_Kigali_Amendment_to_MP.pdf

¹⁰ UN Environment OzonAction Factsheet "The Kigali Amendment to the Montreal Protocol - HFC Phase-down" (available at http://www.unep.fr/ozonaction/information/mmcfiles/7809-e-Factsheet_Kigali_Amendment_to_MP.pdf)

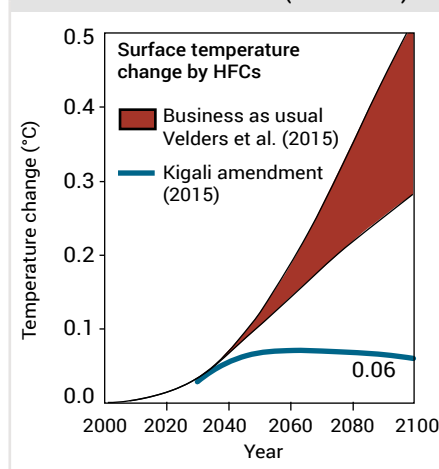


Specific developing countries with high ambient temperatures (HAT) are eligible to apply for a special exemption (called the "HAT exemption") from the phase-down schedule (see Annex 3). The Kigali Amendment will enter into force on 1 January 2019 provided that at least 20 countries have ratified it by that time. The Amendment also contains important provisions related to HFC trade, namely the ban on trade with non-Parties (which will enter into force on 1 January 2033 provided that at least 70 countries have ratified the Amendment by that time) and the mandatory introduction by 1 January 2019 of national HFC import and export licensing systems covering all virgin, recovered, recycled and reclaimed HFCs and mixtures containing them. The Kigali Amendment also contains important provisions related to providing financial assistance by developed (non-Article 5) countries to facilitate the HFC phase-down in developing (Article 5) countries.

The Kigali Amendment contributes significantly to the target set by the Paris Agreement on Climate Change¹¹ which aims to keep the global temperature increase within 2°C by the end of this century. It is estimated that without the actions foreseen under the Kigali Amendment, HFC consumption during that period would grow so much that the HFC emissions from various uses would result in a global temperature increase of 0.5 °C (see Figure 4).

In the context of the Kigali Amendment, it is important to differentiate between the *phase-out* regime established for HCFCs where consumption and production are to be *fully eliminated* and the *phase-down* regime established for HFCs where consumption and production are only *reduced* to a certain level. The rationale behind establishing a phase-down for HFCs, and not a phase-out regime, was the lack of technically and economically feasible alternatives for certain sub-sectors at the time of negotiations. An important feature of the Kigali Amendment is that the quantities allowed to be produced or consumed according to the phase-down schedules are calculated in CO₂ equivalents (CO₂-eq) (in practical terms: in tons of CO₂-eq or GWP tons¹²), not in metric tons. This approach enables the countries to prioritize phasing down those HFCs which have the highest global warming potentials (GWPs), e.g. by introducing bans or other restrictions on use of high GWP HFCs – see "Specific phase-down schedules and use bans for HFCs" option, or on placing on the market of specific types of equipment containing high GWP HFCs – see "Restrictions on imports / placing on the market of products and equipment containing or relying on HFCs" option. It is also important that the production and consumption baseline values¹³ established by the Kigali Amendment are composed of both HCFC and HFC production and consumption and are expressed in tons of CO₂-eq. Such an approach was adopted because it takes into account the fact that the HCFC phase-out process has not yet been completed and therefore HCFCs are still being produced and consumed during the base years for which the HFC baseline was established.

Fig. 4. Estimated effect of the Kigali Amendment on Earth's climate (Velders 2016).



¹¹ The Paris Agreement on Climate Change that constituted a significant step in addressing the reduction of global emissions of greenhouse gases was agreed in December 2015 and entered into force on 4 November 2016.

¹² For the particular HFC substance or mixture: 1 ton of CO₂ eq (or 1 GWP ton) = 1 metric ton multiplied by GWP value of that substance or mixture.

¹³ In the context of Montreal Protocol, the baseline value of consumption or production of a particular group of controlled substances is a value of consumption or production of that group of substances in a given period called "base years," which is assumed to be 100% and from which the phase out or phase down schedules start.





2. OPTIONS RELATED TO MONITORING AND CONTROLLING TRADE RELATED TO HFCS

2.1

Import quotas for HFCs



General description

Virtually every Article 5 country has import quotas already in place for HCFCs. Establishing import quotas for HFCs would mean in practical terms:

Specifying the maximum quantity of HFCs that may be imported each year.

The maximum quantity of HFCs that may be imported each year is based on the consumption limits set by the Kigali Amendment to the Montreal Protocol or by the country's policy on HFC phase-down, if more ambitious. For most of Article 5 countries, the first HFC consumption and production control measure will be the freeze in 2024 at the level of average consumption and production of HFCs in years 2020-2022 (baseline years for HFCs) + 65% of consumption and production of HCFCs in years 2009 and 2010 (baseline years for HCFCs), expressed in CO₂-eq and the next step - a 10% reduction in 2029. However, based on decision XXVIII/2 of the Parties some countries, namely: Bahrain, India, Iran, Iraq, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia, and the United Arab Emirates are allowed to use as the baseline their average combined consumption and production of HFCs in the period of 2024-2026 and of HCFCs (as stated above). Moreover, the Kigali Amendment states that for the countries which have been granted the HAT exemption (see Annex 3 for the list of those countries and the conditions to be met for such exemption) allowed levels of consumption shall be calculated save to the extent that HAT exemption applies.

That maximum quantity of HFCs that can be imported in a given calendar year by the country (the country's "HFC annual quota" or "the country's HFC annual limit") is usually equal to the country's allowed HFC consumption resulting from the Kigali Amendment which, if applicable, also takes into account the relevant decisions of the Parties (see the explanation above). In the great majority of Article 5 countries which are not HFC producers and therefore their consumption is defined as imports – exports, usually exports are not in place or are quite low, therefore establishing country quota at the level of allowed consumption will not disturb imports and will guarantee the certain safety margin if some exports are conducted. In order to have the real guarantee that the actual HFC imports in a given calendar year will not exceed the HFC consumption level allowed for that year it is highly recommended, especially for countries without HFC exports, that a safety margin of 5-10% is left, so the allowed import quota for HFCs in a given calendar year would amount to 90-95% of the allowed consumption for that year. That margin is needed not only to deal with emergencies, unexpected critical needs etc., but also to keep a reserve if the quantity actually imported in a given calendar year exceeds the quota allocated for that year.

Annual country quotas for HFC imports related to the freeze and the phase-down period may be part of the relevant national legislation concerning fluorinated greenhouse gases (F-gases)¹⁴ and need to be expressed in tons of CO₂-eq. It is strongly recommended that the country quota is expressed in tons of CO₂ eq, not in metric tons, because the country's limit for a given calendar year resulting from the Kigali Amendment or from other more ambitious commitments undertaken by the country, e.g. faster phase-down approved by the Executive Committee, will also be expressed in CO₂-eq. For countries which are HFC producers both country import quota and country production quota have to be established.

¹⁴ The term "fluorinated greenhouse gases" abbreviated as "F-gases" is commonly used for HFCs, PFCs and SF₆, i.e. fluorinated substances covered by Kyoto Protocol.

Another approach could be establishing placing on the market quota for the country which would cover the HFC quantities placed on the country's market in a given calendar year by importers or producers.¹⁵ However, in that case the term "placing on the market" has to be defined in the national legislation in order to avoid confusion. Such a quota system is difficult to manage, though, because the Montreal Protocol, as amended in Kigali, controls production, imports and exports of HFCs, but does not control the quantities of those substances actually placed on the market.

Selecting the importers entitled to share the country's annual import quotas, and establish the rules for sharing the quota allowance.

The "first come, first served" approach should be avoided. Instead, it is recommended that the selection of importers is made on the basis of their historical share in the country's total imports of HFCs (and possibly also HCFCs) over a specified period of time. The baseline period (2020-2022) seems to be the most logical option for A5 group countries. However other periods in the past could also be selected, e.g. the period 2021-2022 as it covers the last two years prior to the year preceding the freeze date set up in the Montreal Protocol. The reason for taking such an approach is that (1) this approach is based on transparent criteria and (2) phasing down HFCs would mean losing money (or even total collapse) for certain companies that built their business on HFC 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 if (1) not all country quota is allocated to "old" importers and e.g. 10% is left for "new entrants" or (2) 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 parts of quotas.

Deciding on how the quotas can be used by the importers during the year.

Use of the HFC quotas by importers may be accomplished by either allowing the importers to use their quotas throughout the year within the license valid for one 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 may be given for each shipment (for details of latter option – see "Permits for each HFC shipment" option). If a license is issued for one year or permits allow for multiple shipments, special requirements for customs are absolutely necessary so that each quantity imported as a separate shipment is marked by the customs officer on the original license or permit document (or – if licenses or permits are issued electronically – the marking will be done on-line) and thus subtracted from the total quantity specified in the license or permit.

In any case, the import consignment receipt at the port of entry has to happen within the calendar year relevant to the assigned quota and therefore the validity of license or permit cannot go beyond 31 December of a given calendar year. Obviously, the systems of quota allocation to importers described above supplemented with licenses or permits will fulfill the requirements for the establishment of a licensing system required by Article 4B of the Montreal Protocol only if all HFCs listed in Annex F to the Montreal Protocol are covered, including the substances contained in mixtures, and both virgin and used HFCs are licensed. Since the imported quantities of used HFCs will not be counted in the country's consumption or in country quota they require separate licenses or permits and the relevant containers will have to be labeled accordingly – see "Special requirements for labeling of HFC containers" option.



Advantages / impacts / benefits

The advantage of establishing an HFC import quota system is that it guarantees that the import limits established by the Montreal Protocol (or the country, if its controls are more ambitious than the Montreal Protocol's phase-down schedule) would not be exceeded and that the HFC use in the country may be quantitatively controlled. Therefore, the benefit would be to avoid the possibility of entering into non-compliance with the Montreal Protocol. In case the selection of importers is made on the basis of options, there will also be clear benefit for the selected importers who will be safeguarded in doing their business, being certain of the HFC quotas that have been assigned to them. Obviously, this means restrictions in free trade of HFCs, but it should be understood that this is a necessity to implement trade-related environmental agreements such as the Montreal Protocol.

¹⁵ Such approach was taken by the EU.



Disadvantages / efforts / costs

There is no disadvantage of establishing the HFC quota system envisaged and therefore it is expected that most of the Parties to the Montreal Protocol will decide to introduce such systems. The effort required is not great, because the competent authority has to operate the system based on the relevant legislation. Operating the system may include, for example, making the list of eligible importers, calculating the quotas for each importers from the list, publishing the quotas and – once a license/permit system is established – issuing the licenses/permits. The cost involved in operating such system would either 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 or be covered by the Multilateral Fund, usually in the framework of Institutional Strengthening Project. Usually, the existing National Ozone Unit is assigned to perform that work. Since the quota system for HCFC has already been set up in many Article 5 countries extending it to HFCs may be considered as an obvious option.



Support measures required for effective implementation

Obviously, conducting an HFC inventory in the country would be the substantial action to be undertaken before any decision regarding country quota is made. A survey of importers that imported HFCs in the past will facilitate making the list of eligible importers. Establishing an Informal Prior Informed Consent (iPIC) procedure with HFC exporting countries will help to track a country's quota. Training of customs officers and importers will be a useful support measure that may assist in effective implementation of the quota system. Also the introduction of mandatory labeling of used HFCs in order to differentiate between virgin substances which are covered by quota and used substances which are not, will facilitate monitoring of trade in HFC by the customs. If there are certain HFC applications exempted from a quota system, labeling of HFCs designated for exempted uses has to be established in order to allow for differentiation between HFCs covered by quotas and exempted from quotas.

A very useful support measure will be extension of the HFCs covered by quotas to substances or mixtures contained in imported (or more precisely – placed on the market) selected products and equipment. This would create an additional buffer preventing the country from falling into non-compliance, would facilitate HFC phase down and would allow the competent authority to monitor and control the imports of such selected HFC products and equipment even without licensing such imports. However, the management of such extended quota system is not easy and would require much effort – see item p. 18 for the brief description of such a system established in the EU.



Criteria to define the most suitable implementation schedule

This is one of the options which should be implemented as early as possible if the country decides to establish it based on the criteria described below. Establishing the quota system for HFCs may be part of the agreement with the Multilateral Fund or may be implemented as a separate measure. However, such a system will always be set up as an element of the country's legislation and only very few Article 5 countries have already established the F-gas legislation or are in the process of doing so. Therefore, it is highly recommended that the legislative process leading to introduction of controlling of F-gases and especially HFCs in the country's law should already have been initiated.



Criteria for decision making to implement / not to implement

The main criterion should be the dynamics of increase in HFC imports over the last few years. If that increase is significant, then the establishment of an HFC quota system along with the import/export licensing system will be crucial for controlling HFC trade in order to comply with the 2024 or 2028 freeze and further phase-down steps. It should be emphasized here that the quota allocation system *per se* cannot be considered as import/export licensing system as required by Article 4B of the Montreal Protocol, even if the importers (and exporters) are registered and are obliged to report because (1) it does not cover export licensing and (2) it does not allow for monitoring and control of imports by the customs unless a system of recording the actual quantities imported within the quotas allocated to importers is established.



Status of implementation in selected countries

In 2015 the European Union (EU) introduced in 2015 a working system of annual quotas for HFCs applicable to all HFC producers and importers in the Union. However, in the EU quotas concern the placing on the market¹⁶ of HFCs and not imports or production of HFCs *per se* and, moreover, they include both virgin and used substances. The annual quotas available for allocation to importers and producers are expressed in CO₂-eq and are equal to the annual limits established by the HFCs phase down schedule specified in F-gas Regulation 517/2014.

The importers and producers which have quotas allocated each consecutive year (called “incumbents”) have been selected based on their share of the total production of HFCs and imports of HFCs from outside the EU in 2009-2012. However, they receive only 89% of the total quota for a given year while the remaining 11% is shared equally between those entities which are not “incumbents” and must apply for quota (called “new entrants”). Imports of HFCs are allowed without quota only for exempted uses specified in the Regulation (direct re-export, feedstock, process agents, Metered Dose Inhalers (MDIs), defined military uses and etching or cleaning in the semiconductor manufacturing sector) and for destruction. However, importers have to register and containers have to be labeled with a warning that the contents can only be used for the specific exempted purpose. After each period of 3 years “new entrants” join “incumbents” group and receive quotas based on the HFC quantities they placed on the market in the first two years of that period, so the incumbent’s group composition is changed every 3 years.

A specific feature of the HFC quota system established in the EU is that (starting from 1 January 2017) the EU annual HFC quota covers also HFCs contained in RAC&HP equipment (called “equipment pre-charged with HFCs”) placed on the EU market by importers and domestic manufacturers.¹⁷The importers of equipment (a) purchase from EU importers or producers of HFCs who had their annual quotas allocated the authorization to use part of their quotas (b) sign the “declaration of conformity” where it is confirmed that the HFCs contained in the equipment entering the EU is within quota and (c) keep all relevant documentation that is later verified by the independent auditor. The authorizations referred to above are recorded in the registry managed by the European Commission.

Some other developed and developing countries either have already in place the HFC import licensing/permit system (e.g. Australia, Belize, Burkina Faso, Colombia, FYR Macedonia, Montenegro, Serbia) or are in the process of introducing it (Canada, Egypt). It is noteworthy that some countries (e.g. Australia) which have introduced licensing of HFC imports have not yet set up the HFC quota system, but plan to do it before the Kigali Amendment will enter into force for them.

Regarding HFC inventories, a number of Article 5 countries have already conducted HFC inventories which were financed mainly either from CCAC¹⁸ resources or in the framework of Multilateral Fund Projects. Since the HFC inventory is an inevitable measure to prepare for HFC phase-down the process of conducting such inventories in Article 5 countries continues and there are still good opportunities to receive financial support for that activity.

16 According to the EU F-gas Regulation No. 517/2014 “placing on the market” of F-gases means “supplying or making available to another party in the Union for the first time, for payment or free of charge, or using for its own account in case of the producer, and includes customs release for free circulation in the Union”

17 Under the Montreal Protocol, a country does not need to report substances in pre-charged equipment since the consumption concerns only substances in the bulk.

18 CCAC (Climate and Clean Air Coalition) is the international organization that “...unites governments, civil society and private sector, committed to improving air quality and protecting the climate in next few decades by reducing short-lived climate pollutants across sector.”



Links and resources

- Information on the EU HFC quota system, including links to the relevant legislation is available on https://ec.europa.eu/clima/policies/f-gas_en
- Information on measures taken in Australia in order to facilitate HFC phase down is available on <http://www.environment.gov.au/protection/ozone/legislation/opsggm-review/hfc-phase-down-faqs>
- Recent information HFC regulations in different Article 5 and non-Article 5 countries based on the submissions of the Parties on implementation of decision XIX/6 is available in the Ozone Secretariat document UNEP/OzL.Pro.28/11 <http://conf.montreal-protocol.org/meeting/mop/mop-28/presession/SitePages/Home.aspx>
- Some information on the approaches taken by different countries to manage HFC phase down can be found in
- D.Zaelke, N. B. Parnell and S. O. Andersen : "Primer on HFCs" (IGSD, August 2015) <http://www.igsd.org/wp-content/uploads/2015/10/HFC-Primer-18October2016.pdf>
- More information on applying GWP values in the context of the Kigali Amendment can be found in the UN Environment OzoneAction Factsheet : "Global Warming Potential (GWP) of Refrigerants - Why are Particular Values Used? - Post-Kigali Update", [http://www.unep.fr/ozonaction/information/mmcfiles/7789-e-GlobalWarmingPotential\(GWP\)ofRefrigerantsWhyareParticularValuesUsed_Factsheet.pdf](http://www.unep.fr/ozonaction/information/mmcfiles/7789-e-GlobalWarmingPotential(GWP)ofRefrigerantsWhyareParticularValuesUsed_Factsheet.pdf)
- Calculation of the number of tons of CO₂-eq corresponding to particular numbers of kilograms of a given HFC or HFC-containing mixture is facilitated through so called "F-gas calculator" available on <http://www.boconline.co.uk/en/products-and-supply/refrigerant-gases/global-warming-legislation-hfc-control/f-gas-calculator/f-gas-calculator.html> .
Useful information on that issue can also be found in UN Environment OzoneAction Factsheet : Refrigerant Blends: Calculating Global Warming Potentials (GWPs) - Post-Kigali Update, http://www.unep.fr/ozonaction/information/mmcfiles/7786-e-Calculating_GWPOfBlends_post_Kigali.pdf
- Information on iPIC procedure can be found on <http://www.unep.org/ozonaction/resources/informal-prior-informed-consent-mechanism>
- Information on CCAC can be found on <http://www.ccacoalition.org>



2.2

Exemptions from HFC import quotas



General description

As explained in Chapter 1 the HFC phase-down differs from the HCFC phase-out because when the HFC phase-down schedules were agreed upon by the Parties it was assumed that, towards the end of the HFC reduction process, there would be a certain number of uses where replacement of technologies relying on HFCs with alternative non-HFC technologies would be either impossible or not feasible technically or economically. At that time each Party would be free to decide which uses would still require HFCs. Moreover, even at the time when the Kigali Amendment was decided upon, Parties with high ambient temperatures (HAT countries) claimed that since there were major HFC uses in their countries where technically and economically alternatives had not yet been available, special exemption provisions would be required in the Amendment. That exemption (called "HAT exemption") would allow those countries to import or produce HFCs for use in those specific areas without counting those HFC quantities in their consumption limits based on the agreed phase down schedule. It is then clear that if those countries listed in Decision XXVIII/2¹⁹ of the Parties decide to introduce an HFC quota system to their F-gas legislation they will be able to set up the HFC country quota which will not contain quantities of HFCs used under HAT exemption.

Decision XXVIII/2 opens also the possibility for the Parties to agree in the future (in 2029) on exemptions other than HAT *"such as for essential use and critical uses, for production or consumption that is necessary to satisfy uses agreed by the Parties to be exempted uses"*, so once such exemptions are decided upon, the HFC quantities imported or produced for those other exempted uses will not be counted in the country's consumption limits and, as a consequence, those quantities may not be counted also in the country's annual quotas – if the country decides to set up a quota system.

Finally, according to the Montreal Protocol provisions imports or exports of used (recovered, recycled or reclaimed) HFCs are not included in the calculation of Parties' HFC consumption. Therefore the relevant HFC quantities imported in a given calendar year may not be counted in the country's annual quota set up for that year.

While not counting the HFC quantities (formally exempted from the phase down schedules based on the Montreal Protocol provisions or decisions of the Parties) in the country annual quotas seems to be an obvious approach, it will not be clear as to whether or not the country may count the HFC quantities imported for the uses it considers as being essential or critical without formal approval of the Montreal Protocol Parties. The answer to this question is "yes, they may", but only if the additional measures are implemented – see p. 21.



Advantages / impacts / benefits

Establishing annual HFC country quotas which would not include HFCs imported for exempted uses would be advantageous for the importers concerned who would not have to apply for their quotas each year, considering that they would not import HFCs for the other (non-exempted) uses. It would also benefit the end users since they would not be afraid of scarcity of HFCs for uses categorized as exempted.



Disadvantages / efforts / costs

The disadvantage of such an approach is that additional effort is needed to ensure that the quantities intended for exempted uses are actually applied only for those uses. This would require additional measures and would mean additional cost to the importers (special labeling) as well as an additional effort by the customs and other enforcement bodies. Those agencies will have to control the shipments HFC containers intended for exempted uses including their final destinations in the country.

¹⁹ The list of the countries meeting the criteria of being eligible for HAT exemption specified in Decision XXVIII/2 as well as the list of application areas where that exemption applies will be subject to periodic reviews by the Parties based on TEAP recommendations.



Furthermore, if a country wishes to exempt from its annual quotas the quantities of HFC imported for certain applications not formally exempted by the Parties of the Montreal Protocol, setting up those quotas at appropriate level would require additional effort. Especially, the detailed analysis of the demand of HFCs for the exempted uses which would mean additional cost and effort for the government will be needed. Nevertheless, despite those difficulties some countries may decide to exempt certain HFC uses (e.g. MDIs or military applications) from the quota system.



Support measures required for effective implementation

The support measures listed below are inevitable for the effective implementation of exemptions from country quota:

- (1) the exempted uses must be clearly specified in the country's legislation.
- (2) the import/export licensing and reporting systems must be in place which will cover the imports of HFC for those specific uses.
- (3) the labeling system must be in place which will allow for differentiation between HFCs placed on the market by producers and importers for those specific uses and for the other uses.

If the country quotas are set without accounting for HFC quantities imported for uses which are not formally exempted based on the decisions of the Montreal Protocol Parties, like e.g. military applications, it is inevitable that also the fourth support measure is implemented. Namely, in such a case the country annual quotas should be set up at a relatively low level that will ensure that importing HFCs for such uses without quota will not lead to exceeding the country limit resulting from the phase-down schedule the country had committed for.



Criteria to define the most suitable implementation schedule

If the country decides to establish the HFC quota system the next decision would be whether or not the HFC quantities imported for exempted uses, especially those listed in the HAT exemption decision, should or should not be counted against that country's quota. Such a decision will have to be taken once the list of exempted uses and estimation of the HFC quantities involved have been made.



Criteria for decision making to implement / not to implement

The main criterion to determine whether or not imports of HFCs for certain selected uses should be excluded from country annual quotas set up in the national legislation, is the actual level of HFC consumption and more especially – the difference between the actual country's HFC consumption and the consumption limit resulting from the phase-down schedule for the country set up in the Montreal Protocol. It can be assumed that if a country's consumption limit (calculated in CO₂-eq) is more than 10% higher of the country's total actual consumption including consumption from exempted uses, then the safe margin may be sufficient and the imports for exempted uses may not be counted in the country's annual quotas. Otherwise, there will always be a risk that in a given calendar year imports for exempted uses may increase for some reason and the country may fall in non-compliance with the Montreal Protocol for that year.



Status of implementation in selected countries

Since only a few countries have already implemented the HFC quota system and the exemptions have not yet been defined within the Montreal Protocol (except for HAT applications and used HFCs) it is difficult to discuss the general status of implementation. Nevertheless, the system of exempting certain uses from annual HFC quotas resulting from the phase down schedule established in national legislation is currently in place in the EU. Based on Regulation 517/2014, imports of HFCs are allowed without a quota for exempted uses specified in the Regulation (direct re-export, feedstock, process agents, Metered Dose Inhalers (MDIs), defined military uses and etching or cleaning in the semiconductor manufacturing sector) and for destruction, but importers have to register and containers have to be labeled with warning that the contents can only be used for the specific exempted purpose. Introducing such an exemption from annual quotas was possible because the share of actual consumption of HFCs (including for the exempted uses) in the allowed EU HFC consumption calculated in CO₂-eq is supposed to be lower than 90% assumed as a decisive limit.



Links and resources

- Information on the exemptions from EU HFC quota system is contained in Regulation 517/2014 which can be downloaded from https://ec.europa.eu/clima/policies/f-gas_en
- Decision XXVIII/2 of the Parties containing provisions related to HAT exemption and other future exemptions is contained in Annex 3 to this publication p. 88.





2.3

Mandatory reporting by HFC importers and exporters



General description

Mandatory reporting by importers and exporters is a very important component that should be included in any import/export licensing system since without such a provision, the 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, it has been noted 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 disaggregated enough in the case of HFCs to be used as the main source of information on imports and exports. Specially, as of today²⁰ customs data do not allow for differentiation between the imported or exported quantities of individual HFCs which are needed to calculate the country's annual consumption of HFCs for the purpose of reporting data to the Ozone Secretariat once the country ratifies the Kigali Amendment, and verifying the country's compliance with the Montreal Protocol HFC phase-down schedule or country's own more advanced HFC phase-down targets.

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

The first step is to ensure that what is to be reported is not only the total quantity of each individual HFC and HFC-containing mixture imported or exported annually, but also to ensure that 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 is captured. 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 the submission of data reports, such as the 28 February, and to establish penalties for non-reporting or late reporting. Specially, 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 and, with regard to importers, also from quota allocation (if the country has in place import quota system).



Advantages / impacts / benefits

The advantage of mandatory reporting by HFCs importers and exporters is having a set of data on the HFCs 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 a positive impact on the quality of data reported annually by the country to the Ozone Secretariat under Article 7 of the Montreal Protocol once the country ratifies the Kigali Amendment. Another important advantage is that the competent authority will be able to cross-check the quantities reported by individual importers/exporters with the quantities specified in the relevant licenses or permits. If the system is set up so that additional data are also reported, then an additional benefit will be the opportunity for verifying single shipments if necessary for the purpose of investigating alleged illegal trade activities. For legitimate importers and exporters, the added value of establishing such a reporting system is that it would enable competitors operating 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 the discovery of illegal shipments.

²⁰ The World Customs Organization (WCO) is planning to introduce individual HS codes for some most common HFCs but this change in HS system can only enter into force in 2022 and the Ozone Secretariat is liaising with WCO HS Committee in order to ensure that this issue is taken on board. It is recommended that all countries introduce two more digits in their national customs classifications to the current HS code for HFCs (2903.39) which covers also many other chemicals. HFC-containing blends have currently their own single customs code in the HS system which is 3824.78, but it would be very useful if individual HS codes for the most common HFC-containing blends could be introduced along with individual HS codes for HFCs. In the EU separate customs codes for the most commonly used HFCs and HFC-containing blends have been introduced – see “Training of customs officers” option.



Disadvantages / efforts / costs

Setting up a system for reporting by importers and exporters will mean additional administrative work for the competent authority, but it is worth the effort, taking into account the inevitable advantages. 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.



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 p. 23 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 demonstrate the reporting process, examples of good reports and explain the benefits of mandatory reporting.

Another support measure could be the extension of import/export reporting requirements to all entities that deal with HFCs, i.e. those who import or export HFCs in products or equipment and who use,²¹ recover, recycle, reclaim or destroy ODS or fluorinated greenhouse gases (F-gases). Such an extension is very useful to the competent authority which is responsible for HFC phase-down in the country since it receives full information on the flow of HFCs from/to country (also in products and equipment) and on use of HFCs in various applications. It will be then much easier to decide about the introduction of any restrictions on HFC use – see Chapter 3 “Restrictions on HFC use”. If such extended reporting could be done on-line through an electronic database it would greatly facilitate the process of data collection.

Another very useful support measure is the creation of a requirement for the establishment of HFC logbooks, optionally not only by HFC importers and exporters who will be obliged to report data, but also by other entities that deal with HFCs in the country – see “Mandatory HFC logbooks” option.



Criteria to define the most suitable implementation schedule

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



Criteria for decision making to implement / not to implement

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



Status of implementation in selected countries

Mandatory reporting by both importers and exporters of HFCs has been implemented so far only in a few countries (Belize, EU, Montenegro, Norway) while in some other countries (Australia, Egypt, New Zealand, Yemen) only HFC importers are obliged to report. However, in the EU and Norway reporting is mandatory only if the quantity of all F-gases (including HFCs) imported in a given calendar year exceeds 100 tons of CO₂-eq. In the United States, reporting is mandatory only for HFC suppliers that reached a certain emissions threshold.

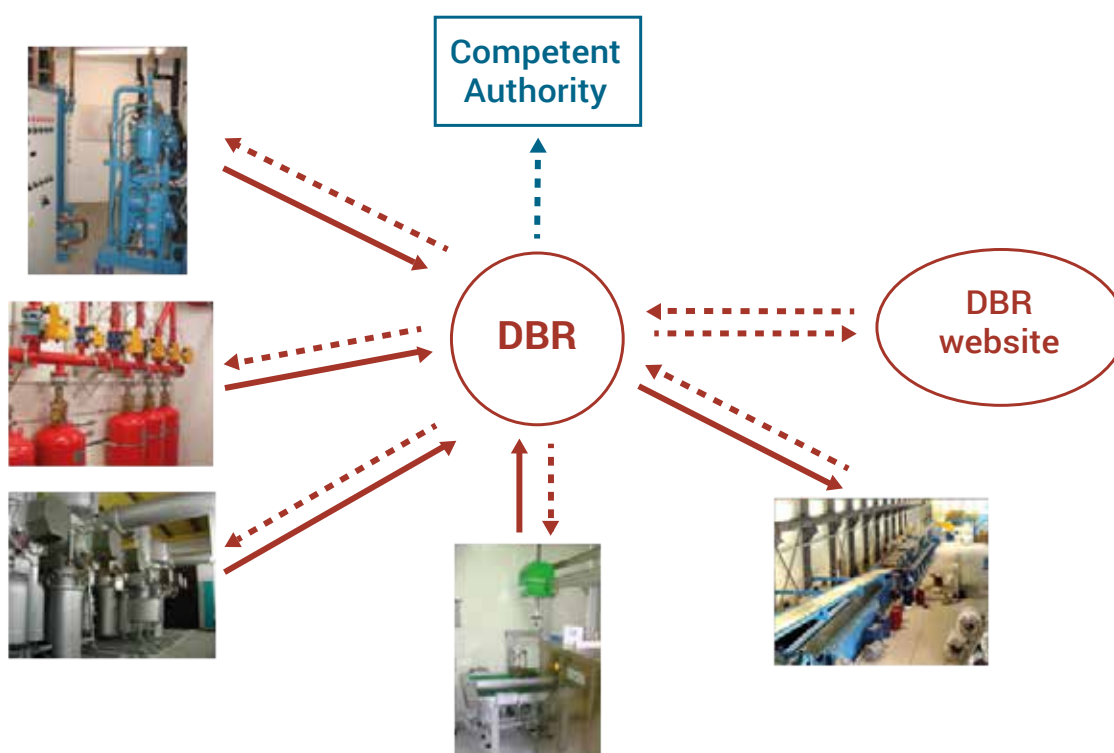
²¹ The term “use” of HFCs must be defined in the country's legislation and may include filling/refilling of equipment with HFCs, applying HFCs in manufacturing of products and equipment and in any other processes (as feedstock, for laboratory and analytical purposes etc.).



In Poland, the central electronic Database of Reports (DBR) has been established and is administered by the Ozone Layer and Climate Protection Unit. Under the DBR entities that import or export ODS and F-gases either in bulk or in products or equipment, and that use, recover, recycle, reclaim or destroy ODS or F-gases are obliged to submit reports annually. The data contained in the reports are analyzed by that institution and the collective data which include, for example, quantities of specific substances entering and leaving the country in bulk or in specific types of products or equipment are submitted to the competent authority (Ministry of Environment). Regarding F-gases, the data provided by this system can be utilized in producing reports on emissions of F-gases to UNFCCC. The simplified scheme of functioning of a DBR established in Poland is presented in Fig. 5.

Fig. 5. Simplified scheme of the functioning of electronic Database of Reports (DBR) on ODS and F-gases established in Poland. The pictures represent sectors from which the reports on HFCs and other F-gases use are submitted, namely: RAC&HP, fire protection, electrical switchgear, foams and solvents. Importers and exporters of HFCs and other F-gases either in bulk or in products or equipment are also obliged to report to DBR.

For the developing countries, Turkey has an electronic reporting system for importers and exporters, but so far it is limited only to ODS, however the country plans to extend it to HFCs and other F-gases. Quite complex reporting and logbook system for refrigerants is in place in FYR Macedonia. For details see the section on HFC logbooks.



© Ezra Clark



Links and resources

- Information on HFC reporting requirements in certain countries can be found in Ozone Secretariat document UNEP/OzL.Pro.28/11 <http://conf.montreal-protocol.org/meeting/mop/mop-28/presession/SitePages/Home.aspx>
- Information on the reporting format for HFCs mandatory in the EU is contained in Implementing Commission Regulation 1191/2014 which can be downloaded through the link accessible on https://ec.europa.eu/clima/policies/f-gas_en
- The website of Central Database of Reports established in Poland is www.bds.ichp.pl More information can be acquired from Prof. Janusz Kozakiewicz kozak@ichp.pl
- The website of FYR Macedonian NOU is <http://www.ozoneunit.mk/home/> and more information can be obtained from Ms Natasha Kochova n.kochova@ozoneunit.mk.

2.4

Labeling of HFC containers



General description

Specific labeling of containers of HFCs and HFC-containing mixtures is a measure that allows customs, environmental inspectors or HFC dealers and users to make a quick, preliminary identification of the contents of HFC shipments. The careful selection of information to be included on the label is therefore a very important element of any HFC legislation. The international community is making continuing efforts to standardize the labels for particular groups of chemicals, including HFCs. Information that should be placed on HFC 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. Since HFCs are greenhouse gases, it is recommended that the label indicates the net mass of the HFC or HFC-containing mixture in the container both in metric units (kilograms) and in tons of CO₂eq and the GWP value of HFC or HFC-containing mixture is also revealed.

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 HFC 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 (some models are now capable of identifying the most common HFC substances and HFC-containing mixtures) or using laboratory-based analysis (such as infrared spectroscopy or gas chromatography). Information as to whether the HFC is virgin (i.e. unused or newly produced), recycled or reclaimed is also very important because virgin HFC are covered by phase down schedules (so also are included in the country's annual quota) while used HFCs are not.

If the shipment is intended for laboratory or analytical uses, then information on its purity must be shown on the label. If the country decides to exempt importation of HFCs for specific uses from the quota system it is highly recommended that containers with such HFCs are labeled accordingly identifying the specific purpose for which the contents of the particular container can be applied.

It is useful for the importing country to decide requiring labels in their 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).



Advantages / impacts / benefits

The main advantages of labeling is that it allows for the first quick identification of the substance or mixture and, if legislation is carefully 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 HFC trade. Labeling is also inevitable for differentiation between shipments of virgin and used HFCs and between HFC containers which may be applied for all uses and HFC containers which may be applied for exempted uses only.



Disadvantages / efforts / costs

The major disadvantage of labeling is that it means an additional administrative burden for the producers, importers and exporters. The World Customs Organization's GHS (Globally Harmonized System of Classification and Labeling of Chemicals) has not published any specific pictogram to represent fluorinated greenhouse gas.



Support measures required for effective implementation

An essential support measure that would assist in the implementation of labeling requirements of HFC containers is the requirement for the proof of origin (described in “Requirement for proof of origin for HFC shipments”). 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. Introducing mandatory labeling of HFC containers will also help to prevent mislabeling of HCFC containers as containing HFCs.



Criteria to define the most suitable implementation schedule

There is no specific time schedule recommended for implementing labeling provisions, however, implanting such provisions in the short term, specifically at a date of the HFC consumption freeze, will be advantageous to the country.



Criteria for decision making to implement / not to implement

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



Status of implementation in selected countries

In the European Union, labeling of F-gas containers (and products and equipment containing or relying on F-gases) which are placed on the EU market is mandatory according to Regulation 517/2014. In that regulation, and in Commission Implementing Regulation (EU) 2015/2068, specific requirements concerning the label are included. It is mandatory, *inter alia*, that the label contains the phrase “Contains fluorinated greenhouse gas” and information on the name, GWP and producer of F-gas, its quantity expressed in mass units and in CO₂ eq (see Fig. 6), and must be clearly readable. Specific labeling of containers is required if HFCs are intended for exempted uses, so that the use of the particular container being shipped is clear. Apart from the EU, some special requirements on labeling of HFC containers as well as of labeling products and equipment containing HFCs have been introduced, *inter alia*, in Norway, Switzerland, Montenegro and Belize. In the United States labeling is mandatory for HFC containers intended to be used for refilling mobile air conditioning (MAC) equipment, but there are no special requirements for labeling other HFC containers or products and equipment containing or relying on HFCs.

Examples of a label on a container with reclaimed HFC and of a label on HFC-containing equipment are shown in Fig. 6 and Fig. 7, respectively.

Fig. 6. Example of labeling the container with reclaimed HFCs. (courtesy of PROZON Foundation, Poland)

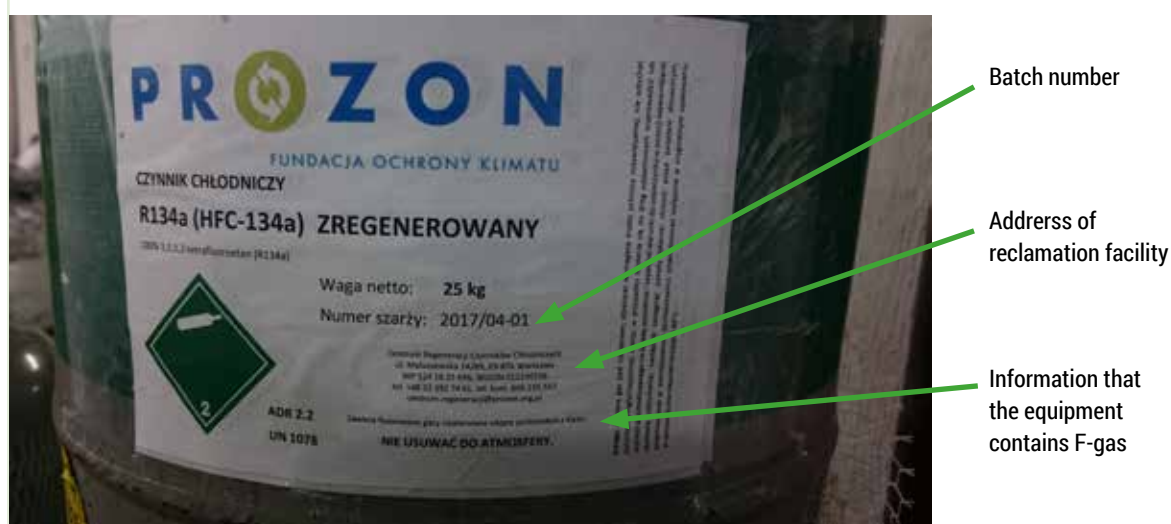
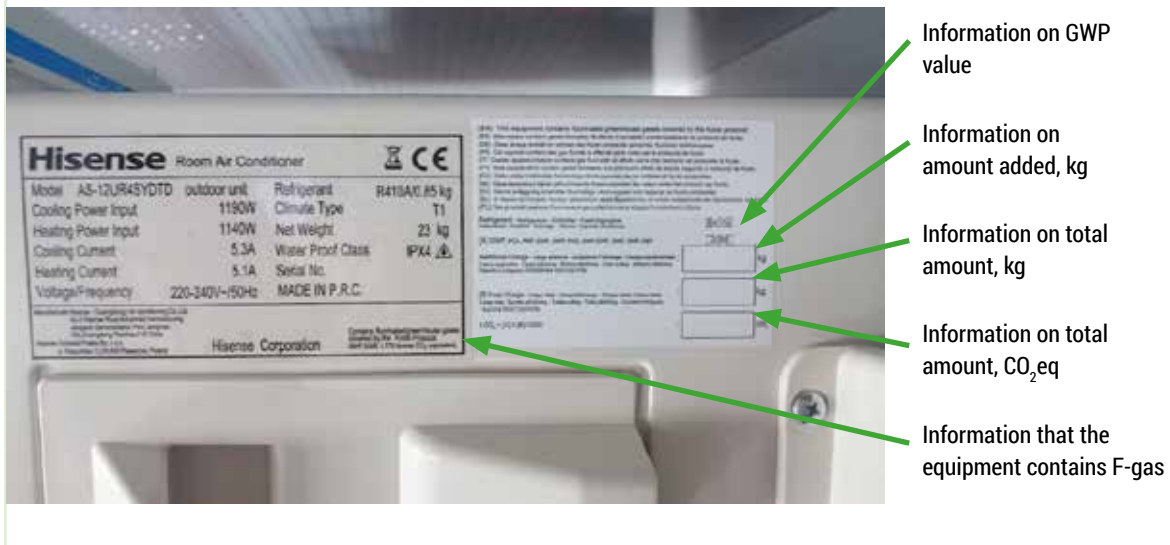


Fig. 7. Example of labeling the equipment containing HFCs according to the EU requirements (courtesy of PROZON Foundation, Poland)



© Ezra Clark



© Ezra Clark



Links and resources

- EU Regulation (EU)517/2014 and Commission Implementing Regulation 2015/2068 are available on https://ec.europa.eu/clima/policies/f-gas_en
- Information on labeling requirements of HFC containers in the other countries can be found in Ozone Secretariat document UNEP/OzL.Pro.28/11 <http://conf.montreal-protocol.org/meeting/mop/mop-28/presession/SitePages/Home.aspx>
- Update on New Refrigerants Designations and Safety classifications http://www.unep.fr/ozonaction/information/mmcfiles/7847-e-Factsheet_ASHRAE_Standard_34&15.pdf
- Smart phone application Whatgas UN Environment OzonAcation



2.5

Ban on non-refillable HFC containers



General description

The term “non-refillable container” refers to 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 HFCs is for refrigeration and air conditioning (RAC), 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. Another problem is that non-refillable cylinders may easily be used by the persons who are not certified refrigeration technicians and thus may not be able to manage the refrigerant properly which may lead to uncontrolled emissions. The used non-refillable containers are discarded and increase the volume of wastes. Moreover, they usually contain some amount of refrigerant which is then vented to the atmosphere in the landfills.

When a country is considering a ban on import or placing on the market of non-refillable containers, it is very important both for the enforcement services (e.g. customs or environmental inspectors) and the HFC dealers and users to differentiate between non-refillable containers and refillable containers. However, that differentiation is not always easy. One way to differentiate is by weight. Non-refillable containers containing HFCs (which are gases) are usually lighter than the refillable ones, their construction is less substantial requiring less material and there is always only one valve whereas larger refillable cylinders may sometimes contain two valves. Additionally, the typical capacity of such non-refillable containers is 13.6 kgs, 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 (front) and refillable (back) cylinders used for transportation or storage of ODS refrigerants, including HFCs.



© Ezra Clark



Advantages / impacts / benefits

A ban on the placing on the market of non-refillable HFC containers is one measure that can assist in a faster phase-down of HFCs, because without such containers, the illegal trade that leads to sustaining the demand for HFCs 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 HFCs remaining in used non-refillable containers, since those residual “heels” (i.e. the small quantity of gas that cannot be removed from the cylinder) eventually leak out of the discarded cylinders.



Disadvantages / efforts / costs

There are no clear disadvantages to such an approach, except for the additional effort and cost to dealers and servicing companies to re-package HFCs from big tanks into smaller refillable containers and to ensure these are returned after use. However, the cost for the HFC users should not increase because the price of specific HFC 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.



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 HFCs 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 HFC containers” option) for HFC containers may also be considered. The ban on non-refillable HFC containers should be introduced along with the same ban on HCFC non-refillable containers if the later has not yet been established (which should effectively close the possibility of the most common illegal trade in selling non-refillable cylinders containing CFCs or HCFCs and mislabeled as HFCs or containing HFCs and mislabeled as HFOs).



Criteria to define the most suitable implementation schedule

The implementation of this option may be timed to match the start of first major restrictions on HFCs under the Montreal Protocol, i.e. 2035 or 2037 (30% reduction and 20% reduction for Article 5 countries Group 1 and 2, respectively), though earlier implementation will help prevent illegal trade and facilitate the HFC phase-down in the future. However, the pre-condition for implementation would be the availability of appropriately trained customs officers who will be able to track the illegal imports of HFCs in non-refillable containers and also a sufficient number of skilled refrigeration technicians who will be able to manage refillable cylinders properly.



Criteria for decision making to implement / not to implement

The main criterion to determine 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 HFC emissions. Support or lack of support from the sector concerned should also be taken into account before the relevant decision is made.



Status of implementation in selected countries

Presently, quite a few countries have a ban in place on non-refillable HFC containers. These include, e.g. Australia, Canada, the European Union, Montenegro and Tajikistan. India has established strict regulations on pressurized gas cylinders that allow for seizure of non-refillable cylinders containing HFCs under the Explosives Act by the customs if the requirements prescribed by that legislation are not met.



Links and resources

- Australian legislation on HFCs is available on <https://www.legislation.gov.au/Details/F2017C00013>
- Canadian legislation on HFCs is available on <https://www.ec.gc.ca/ozone/default.asp?lang=En&n=E06A6B0D-1> and <https://www.ec.gc.ca/ozone/default.asp?lang=En&n=5B8173AA-1>
- EU Regulation (EU)517/2014 on F-gases is available on https://ec.europa.eu/clima/policies/f-gas_en
- Indian Gas Cylinder Rules, 2004 - available on <https://indiankanon.org/doc/194167222/>



2.6

Restrictions on placing on the market of products / equipment containing or relying on HFC



General description

The Montreal Protocol only addresses ODS and HFCs in cylinders/containers, not products or equipment containing such substances or relying on them²². However, the option for countries that do not want products or equipment²³ containing particular ODS²⁴ to enter their territory is to request the Ozone Secretariat to include them on the list of such countries, which they place on their website (see p. 33). Nevertheless, a country may want to consider establishing restrictions on imports / placing on the market of products and equipment containing (and relying on) certain HFCs. Such a measure would help reduce the demand for HFCs. There are five decisions that must be taken to establish such a control.

The first decision would be for a country to decide whether they want to ban used equipment or used and new equipment. Banning the used equipment is important for developing countries since otherwise some of them could become a place where the used obsolete equipment from developed countries would be shipped. Therefore, ban on used equipment should be introduced as soon as possible. The ban covering selected types of new equipment can be done at a later stage, after the phase-down activities start.

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

The third decision to take is whether or not the competent authority wishes to restrict only imports, or imports as well as placing on the market. The term "placing on the market" may be interpreted differently, therefore each country must have a clear definition of "placing on the market" in their legislation or policy documents. For countries that manufacture HFC-containing products or equipment, the decision 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 domestic manufacturers will be benefited and basic international trade rules would then be broken.

The fourth decision to take is whether or not the competent authority wishes to impose a ban on imports / placing on the market of products and equipment containing HFCs or to only extend the quota system and/or licensing system for HFCs to also cover products and equipment containing (or possibly also relying on) HFCs.

The fifth decision to take is whether or not the competent authority wishes to impose the trade restrictions to all products and equipment containing (and possibly also relying on) HFCs or limit those restrictions to selected group or groups of such goods. In practice the second option is usually selected because only in very specific cases it will be possible to impose total import and placing on the market ban on HFC products and equipment. Such approach may be possible example if the country's HFC consumption is very small and is limited only to servicing RAC&HP equipment.

22 The only provision of the Protocol that addresses products or equipment is the ban on imports of products and equipment containing CFCs and halons from non-Parties which does not concern HFCs

23 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.

24 It is quite likely that this option is very soon extended to cover HFCs.

Since there may be several different approaches to the issue of restricting the trade in products and equipment containing/relying on HFCs, only advantages and disadvantages of the following selected options will be presented below:

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

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

Option C: Including the HFCs contained in selected products and/or equipment in country's annual quota²⁵



Advantages / impacts / benefits

Options A and C: The advantage of these options (licensing or quota) is that they are not as drastic as the use bans on HFCs – see “Specific phase-down schedules and use bans for HFCs” option. At the same time these options allow the competent authority to monitor and control the flow of products and equipment containing / relying on HFCs and also, if necessary, regulate it by limiting the type or total number of units of equipment type or total weight of products that would be permitted to enter the country in a given calendar year.

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



Disadvantages / efforts / costs

Options A or C: The disadvantage of these options (licensing or quota) is that they require careful design of the licensing or quota system and imposes additional administrative burden on the competent authority and enforcement bodies (customs, environmental inspectors). It would also be very difficult to decide on criteria by which the importer would be given a license – it may be easier with quota. It should be added that based only on HS customs codes²⁶ the products and equipment which actually contain or rely on HFCs cannot be identified, so in the country which decided to introduce licensing of HFC products or equipment or including HFCs contained in products or equipment in country's annual quota the number of digits of customs codes in national customs classification has to be extended to allow for such identification.

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



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 HFCs. However, producing such a list is very difficult and has not been included so far in the Montreal Protocol. Once such list is established either at the international or national level the national customs codes have to be assigned to specific items on the list to allow monitoring and control of their imports by the customs.

If one of these options is established the customs officers and customs brokers will require additional training to understand and implement the relevant provisions (see also “Training of customs and environmental officers” option where this issue is explained). Relevant training for importers and exporters of HFC products and equipment may also be considered as that is a useful support measure whenever the new regulations regarding imports and exports are to be established.

²⁵ This option is described p. 18.

²⁶ In the EU specific customs codes for the most frequently traded types of RAC&HP equipment pre-charged with HFCs have been introduced – see also “Training of customs and environmental officers option”.



Criteria to define the most suitable implementation schedule

Options A or C: If one of these options is chosen, it has to be designed and introduced as quickly as possible, i.e. before the first step of HFC phase down.

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 taking into account the availability of alternative technologies, 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 gradually eliminated later.



Criteria for decision making to implement / not to implement

Countries may wish to select Option A (licensing) or Option C (quota) first and transition to Option B (bans) later when the process of the HFC phase-down is more advanced.



Status of implementation in selected countries

In the present EU Regulation (517/2014) on F-gases, the import and placing on the market of products and equipment containing HFCs is allowed, but the quantities of HFCs contained in RAC&HP equipment which is placed on the EU market are included in the EU annual HFC quota²⁷. However, one of the EU Member States, Denmark, has already banned placing on the market products and equipment containing or relying on HFCs with certain exemptions. Bans on imports of HFC equipment have also been introduced in some other countries, e.g. in FYR Macedonia the import of used refrigerators, freezers and other cooling and freezing devices relying on HFCs is banned as of 2007.



Links and resources

- EU F-gas Regulation No. (EU)517/2014 and Implementing Commission Regulation on declaration on conformity No. (EU)2016/879 are available on https://ec.europa.eu/clima/policies/f-gas_en
- Information on additional measures related to products and equipment containing or relying on HFCs taken by Denmark is available in D. Brack: "National legislation on hydrofluorocarbons" available on http://www.igsd.org/documents/NationalLegislationonHydrofluorocarbons_9.11.151.pdf



2.7

Permits for HFC transit



General description

At present significant portion of illegal HCFC shipments occurs because of the lack of control of goods moving from one country to another through a third transit country. Following the control of HFCs under the Kigali Amendment, a similar situation is expected to occur with regard to HFCs. Such HFC trade often 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 the domain of customs. This attracts criminal elements to redirect, mislabel, or otherwise falsify the shipments.

Permits for HFCs in transit are then an important means to combat illegal trade in HFCs (and in HCFCs, as HCFCs are often shipped under the name of HFCs) under these circumstances. The usefulness of permits for transit has been proven to help reduce illegal HCFC trade, therefore it is logical that they may be equally useful to address illegal HFC trade.

In practical terms, permits for HFCs 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 issue of the permit, each HFC 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 HFCs” option) 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 links p. 35), the Parties have not issued any specific decisions regarding the adoption of permitting systems for ODS or HFCs in transit. A few countries have already included controls of ODS in transit in their ODS legislation, so it would not be too difficult for them to extend those provisions to cover HFCs. Other countries have general customs legislation that allows for customs to examine goods without necessitating the establishment of a special permit system. However, the control of in transit trade is outside the purview of customs agencies within many countries.



Advantages / impacts / benefits

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



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. Specifically, apart from establishing the requirement for transit permit in the country's HFC legislation there may be a need to amend for that purpose some other elements of countries' laws, for example the Customs Act, so a significant effort may be required by the National Ozone Unit/Government.



Support measures required for effective implementation

Customs officers will require additional training to understand and implement the relevant provisions of the permit system for HFCs in transit (see also "Training of customs and environmental officers" option). 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.



Criteria to define the 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 for this is that the Customs Law will need to be substantially amended. Therefore, while not the first priority, in certain countries this option may have value from the point of view of controlling the trade in HFCs.



Criteria for decision making to implement / not to implement

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



Status of implementation in selected countries

Examples of countries which have already implemented transit permits for HCFCs, but not yet for HFCs 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.



Links and resources

- "ODS tracking: Feasibility study on developing a system for monitoring the transboundary movement of controlled ODS between the Parties": https://s3.amazonaws.com/environmental-investigation-agency/posts/documents/000/000/438/original/ODS_Tracking.pdf?1468427492
- "Free trade zones and trade in ODS" – UN Environment Factsheet, http://www.unep.fr/ozonaction/information/mmcfiles/7745-e-Factsheet_FreeTradeZonesandtradeinODS_2015.pdf



Permits for each HFC shipment



General description

An effective way to closely control HFC imports is to use a “shipment-specific” permit approach under which permits are issued for each HFC shipment arriving into the country. In practical terms, this is just an extension of the basic HFC quota system described in “Import quotas for HFCs” option, 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 within the annual quota. 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 HFCs 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 HFCs 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 HFCs phase-down has been completed. In this case imports would only be allowed for destruction or for the HFC uses exempted by the Montreal Protocol, but it is not yet clear which those uses will be. 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 HFCs. In this case, establishing export quotas does not make sense since HFC exports per se are not limited by the Montreal Protocol, but it is recommended that the exporters are registered in advance.



Advantages / impacts / benefits

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

Avoiding import of more HFC than permitted by reusing 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 HFC imports may exceed their HFCs consumption limit set by the Montreal Protocol provisions or by the country's own more ambitious phase-down schedule.

Allowing for stricter control of the flow of HFCs 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 HFC in each permit, which is more difficult to do in a standard quota system where licenses are issued 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-down HFCs on substance-by-substance or use-by-use manner – see “Specific phase-down schedules and use bans for HFCs” option. Such system would also be very useful for countries which would decide to take advantage of HAT exemption or any other exemption from phase-down schedules agreed by the Parties because it would very much facilitate monitoring and control the HFC imports for exempted applications – see “Exemptions from HFC import quotas” option.



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 HFCs 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 may decide not to implement such a system, at least at the present time when the phase-down schedules for HFCs are to start only in the future and the end of phase-down date is far away.



Support measures required for effective implementation

The same support measures as those recommended for import quota systems described as part of the "Import quotas for HFCs" option 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.



Criteria to define the most suitable implementation schedule

Once the country decides to establish a system for issuing permits for each HFC shipment, the implementation schedule will depend on that country's level of ambition with regard to controlling HFCs. In principle, two possible dates may be recommended for consideration by Article 5 Group 1 countries for which the first HFC consumption reduction step starts in 2029:

1 January 2026 – if the country wishes to start stricter control of HFCs imports already in the beginning of the 2026-2028 period preceding the 2029 reduction step (10%), so it will be much easier to achieve that reduction level or a more ambitious goal, if any.

1 January 2029 – if the country just wishes to ensure that the 10% reduction or a more ambitious goal set up individually is followed.

For Article 5 Group 2 countries which have later date of the first reduction step (1 January 2032) agreed upon in the Kigali Amendment those dates may be moved forward by 3 years.



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 HFC shipment is whether or not the country plans to follow the Montreal Protocol dead-lines, or whether to adopt more ambitious targets. Another criterion is the phase-down dates for specific HFCs or for specific HFC uses. The country would need to decide whether such dates are to be established. If the answer is "Yes", introducing permits for each HFC shipment is highly recommended.



Status of implementation in selected countries

In cases where countries have already implemented a licensing system of HFC imports (e.g. Montenegro or FYR Macedonia) licenses are issued on a "per shipment" basis.



Links and resources

- Information on iPIC procedure can be found on <http://www.unep.org/ozonaction/resources/informal-prior-informed-consent-mechanism>
- Information on countries which implemented HFC licensing can be found in D. Brack : National legislation on hydrofluorocarbons (2015) on http://www.igsd.org/documents/NationalLegislationonHydrofluorocarbons_9.11.151.pdf



Requirement for proof of origin for HFC shipment



General description

The “Proof of origin” issued for the shipment of a particular substance or mixture, in this case an HFC or HFC-containing mixture, should be understood to mean an official document signed by the producer of the substance or mixture in question confirming that the shipped substance or mixture 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 should accompany the physical shipment, so the customs officer can examine it as part of clearance procedure. If a country decides to include a requirement for “proof of origin” in its HFC control legislation, the legislation should specify the language in which the “proof of origin” document should be presented, the information it should contain and who is supposed to sign it. 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 HFCs, since the consumption of recycled or reclaimed HFCs is exempted from Montreal Protocol phase-down schedules provided that the traded quantities are reported under Article 7²⁸. According to the Montreal Protocol “recycled” ODS are those ODS recovered from products or equipment that 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 that are cleaned to meet specified standard of performance. Usually such thorough cleaning is done in a facility where distillation processes are carried out. It is anticipated that understanding of terms “recycling” and “reclamation” with regard to HFCs is the same.



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 HCFCs would be shipped or placed on the market under the name of HFCs. If placing on the market of recycled HFCs is banned as an additional measure, establishing the requirement for the “proof of origin” would assist with preventing virgin HFCs being traded under the name of used HFCs. Such an additional measure would also create a strong incentive for establishing new reclamation facilities for HFCs that could be advantageous since the supply of virgin HFCs would slowly diminish along with progress in global HFC phase-down. There is also clear that extending the requirement of proof of origin to cover products and equipment containing HFCs would facilitate monitoring and control of quantities of HFCs entering the country.



Disadvantages / efforts / costs

Such an approach would create additional administrative burden for the producer (or importer) who is supposed to issue the “proof of origin”. If the ban on placing on the market of recycled HFCs would accompany a requirement for “proof of origin”, it would mean some limitations for RAC servicing companies that would no longer have option of trading with imported recycled HFCs.

Another disadvantage is that the requirement of a “proof of origin” imposes an obligation on a company in a different country (similar to special labelling requirements). If a low consuming country introduces this requirement, it may create a problem since the producers may not have interest in fulfilling this requirement for relatively small quantities.

²⁸ Actually, Decisions IV/24 and VI/19 of the Parties to the Montreal Protocol which talk about that issue concern ODS, not HFCs, but it may be anticipated that the same rules would apply to HFCs.



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 HFCs (but not a ban on placing on the market of reclaimed HFCs). In practice it would mean first of all an import ban on recovered/recycled HFCs. However, it would also mean that the entity (usually a servicing company) which recovered the HFC from equipment would not be allowed to sell that recovered HFC (or give it away free of charge) to another entity, but would be allowed to use that recovered HFC (optionally after basic cleaning) in the same or other equipment, i.e. recycle it, or send it either for reclamation or for destruction.

Another approach which may be taken to support or possibly replace the “proof of origin” is for customs to verify the shipment to determine whether or not it is legal. In this way they will be obliged to assign a specific unique number (see Fig. 7)²⁹ to that shipment during customs clearance process. The same number could then be included in customs documentation and placed on a specially-designed label that is difficult to counterfeit. When this shipment enters the country, the legality of the HFC in a given container can be easily confirmed by other enforcement agencies and even by the end users by checking the special registry of shipment numbers which will be public information³⁰. Applying this approach would reduce and eventually stop illegal trade in HFCs (and in HCFCs if the same system is established for HCFCs).

An additional measure which may also be implemented if the country wishes to monitor and control the quantities of HFCs imported in pre-charged RAC&HP equipment is the requirement for a “declaration of conformity” which can be considered as special kind of proof of origin.



Criteria to define the most suitable implementation schedule

The implementation of this option should start at the beginning of HFC consumption reduction under the Montreal Protocol, i.e. 2029 (for Article 5 Group 1 countries) or 2032 (for Article 5 group 2 countries), though earlier implementation should help to prevent illegal trade and facilitate the HFCs phase-down in the future.



Criteria for decision making to implement / not to implement

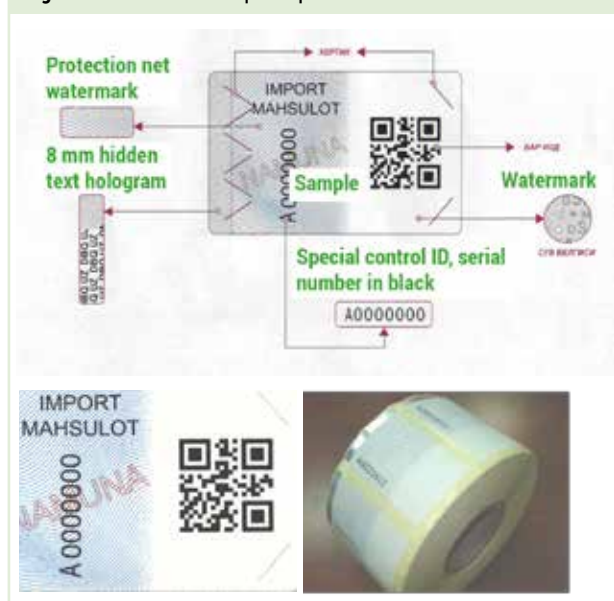
The main criterion for making the decision whether or not to implement a “proof of origin” system would be the interest of the country to use all possible measures to prevent illegal HFC (and HCFC) trade.



Status of implementation in selected countries

At present no countries formally require “proof of origin” for HFCs. However, a similar document called “certificate of origin” is required under the CITES Convention which deals with international trade in endangered fauna and flora. In the European Union, this measure has been partly implemented through requirement of “declaration of conformity” for RAC&HP equipment pre-charged with HFCs which is part of Regulation (EU)517/2014 (see item 2.1.7 for details). Moreover, the “proof of origin” is required for recycled or reclaimed HFCs placed on the EU market since the labels on the relevant containers must contain information on the recycling or reclamation facility (p. 27).

Fig. 8. A label with an unique shipment number in a form of a barcode



With permission of the State Customs Committee of the Republic of Uzbekistan

²⁹ Optionally, that number would be in a form of barcode which would then contain all information about the shipment.

³⁰ If the barcode is used it can be easily read by passing the label through a special scanner – just as it is normally done with all goods marked with barcodes.



Links and resources

- More information on a system of unique numbers assigned to HCFC shipments in a form of barcodes can be found in a presentation by Uzbekistan customs delivered at the Regional Customs Cooperation Meeting and Ozone Protection Award for Customs & Enforcement Officers, Ashgabat, Turkmenistan, 24-25 May 2016.
- CITES Convention text - available on <http://www.cites.org>
- EU Regulation 517/2014 and Commission Implementing Regulation 879/2016 (dealing with declaration of conformity) are available on https://ec.europa.eu/clima/policies/f-gas_en



2.10 Fees for HFC imports / placing on the market



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 or HFC phase-down process. While import fees are relatively straightforward and applicable to any quantity of HFC (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 1005/2009 on ODS it means any *“supplying or making available to the third party and includes customs release for free circulation...”* and only in the case of products and equipment being part of immovable systems or part of means of transport means *“supplying or making available to the third party for the first time”* while in the EU Regulation 517/2014 on F-gases it means always *“supplying or making available to the third party for the first time and includes customs release for free circulation”*.
- A “placing on the market fee” for HFCs would not apply to HFCs acquired by domestic manufacturers of HFC products or equipment on the local market. A “placing on the market fee” would also not apply to HFCs recycled or reclaimed within the country’s territory.
- 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 HFC products (e.g. polyol blends for foams or just foams) or HFC 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 free to the country where there is a fee in place.
- In such a case, fees should also be imposed on HFC contained in imported products and equipment while allowing for reimbursement of the fee if the products or equipment are re-exported.
- Banning imports of such products equipment containing HFCs while allowing their manufacture in the country would not be possible as it would break international trade rules.

The possibility of excluding HFCs from an import fee should also be considered if they are imported for destruction or for exempted uses (feedstock, process agents, laboratory and analytical uses or any uses considered by the country as exempted from country quota – see “Import quotas for HFCs” option).

In order to differentiate between the various HFCs or various HFC-containing mixtures, the level of such a fee for each HFC and HFC-containing mixture could be determined depending on its GWP value. If fees are imposed on HCFCs but not on HFCs, the unintended effect may be the promotion of HFCs. Therefore, if the import fee has already been imposed for HCFCs a similar approach should also be considered for HFCs.



Advantages / impacts / benefits

There are three major benefits of imposing import or placing on the market fees on HFCs:

- Creating disincentives for using HFCs for which fees are high due to their GWP and thus an incentive to use alternative refrigerants
- Achieving better recovery rates – the demand for recycled or reclaimed HFCs would increase due to their lower market price as compared to virgin HFCs
- The unique opportunity to create an “environment fund” from the fees collected which could finance costs related to HFC phase-down through initiatives, such as such as bonuses for recovery or creation and operation of F-gas (and ODS) databases (see “Mandatory HFC logbooks” and “Mandatory HFC equipment logbooks” options) or financing disposal of ODSs and F-gases.



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 HFCs (and mixtures) should be introduced together with fees on HFCs 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 disadvantage is that import fees may create incentives for illegal trade in order to avoid this additional cost.



Support measures required for effective implementation

If an HFC import fee is planned to be established an inevitable support measure will be an HCFC import fee if it has not been introduced earlier. Otherwise, imports of HCFCs will be unnecessarily promoted.

Accurate reporting by importers (see “Mandatory reporting by HFC importers and exporters” option) would be necessary for the effective implementation of fees for HFC imports and therefore maintaining HFC logbooks (see “Mandatory HCFC logbooks” option) would be helpful in that respect. Strengthening of border control and enforcement agencies would be needed to reduce the risk of illegal trade in HFCs resulting from their higher market price in the country which has introduced the import fee. Another support measure would be creating financial incentives for HFC replacements, especially those which are not potent greenhouse gases, such as ammonia, CO₂, hydrocarbons or HFOs. At the same time, unintended incentives for the use of HFCs should be avoided.



Criteria to define the most suitable implementation schedule

An appropriate time for the introduction of fees is the date when the specific HFC use bans are introduced. However, if the country really foresees an ambitious HFC phase-down schedule it may decide to introduce HFC import fees much earlier, e.g. at a time when restrictions on placing on the market of products and equipment are introduced. This would eliminate the need of imposing additional fees on HFCs contained in imported or locally manufactured products and equipment, especially if at the same time alternative technologies will be promoted. If the country has already introduced import fee for HCFCs extending it to HFCs is highly recommended since otherwise the incentive for illegal trade in HCFCs under the name of HFCs will be created.



Criteria for decision making to implement / not to implement

Import or placing on the market fees can only be considered by countries, which are not bound by international trade agreements that do not allow the introduction of such fees. When considering the introduction of such fees, the country should be prepared to implement certain support measures. Without these support measures, the introduction of import or placing on the market fees may not be effective.



Status of implementation in selected countries

Certain European countries (Denmark, Spain, Slovenia and Norway) have introduced fees for HFCs entering their territory. The level of HFC import fees depends on GWP of the substance or mixture and the fees established in Norway, Denmark and Spain are very high (20-40 Euros per ton of CO₂ eq.). As a result these three examples may be difficult for developing countries to follow. It should be noted that in Slovenia the fee is only around 4 Euros per kg (it is calculated by multiplying the standard fee per kg which is 0.003456 Euro by GWP of the substance). In some EU countries like Poland or France a similar fee was proposed, but eventually not established because of industry resistance. In some other countries there is a standard fee paid for HFC license (e.g. in Australia) or for any incoming shipment of HFCs (e.g. in Montenegro). In Australia the fee for a HFC license amounts to AUD 15,000 and in Montenegro the fee for each HFC shipment amounts to 5 Euros. Australia also introduced a fee for HFC equipment import license – it amounts to AUD 3,000. Moreover, some countries such as the Seychelles introduced tax incentive to avoid imports of HFCs, that is zero customs tax for substances which have zero ODP and zero GWP.



Links and resources

- General information on fees established in different countries may be found in D. Brack : National legislation on hydrofluorocarbons (2015) on http://www.igsd.org/documents/NationalLegislationonHydrofluorocarbons_9.11.151.pdf





Electronically operated licensing system for HFCs



General description

Introducing electronically-operated licensing systems requires not only the development of customized computer programmes, but also computer and internet access of importing and exporting companies and of customs offices where HFCs are declared for customs clearance. Importers or exporters have their own user-names 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 (in the case of import license) with the importer's quota.



3. The system displays a generic message 'waiting for approval' if the application is positively verified or "needs correction" if it is 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.³¹



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.³²



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

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

31 In more advanced electronic licensing systems the system verifies the correctness of the license automatically and sends the approval via e-mail to the importer or exporter. If that approach is taken, the system operator usually makes checks of some randomly selected licenses in order to be sure that the automatic verification proceeded correctly. A modification of that approach can be that the automatic verification applies only to "standard" licenses while more complex cases are verified manually.

32 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. If that approach is used, 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.



Advantages / impacts / benefits

The advantage of an electronic licensing 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 for customs offices is that once they have become computerized and trained, the process is easy and fast. The system also provides for instant access to the necessary data and thus facilitates customs clearance.



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 both on competent authority and customs side.



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 HFCs and permits for each HFC shipment (see "Import quotas for HFCs" option, and "Permits for each HFC shipment" option) would be another support measure. Electronically operated systems would not be economically effective just for HFCs, so it should rather be part of the system covering HCFCs and HFCs or all customs goods. Using an informal Prior Informed Consent (iPIC) procedure to contact exporting countries may also be helpful.



Criteria to define the most suitable implementation schedule

There is no specific implementation schedule of electronically operated licensing systems that could be recommended. The experience in manual (paper) licensing of HCFCs and / or HFCs already gained by the countries' responsible bodies would be advantageous in design and implementation of such system.



Criteria for decision making to implement / not to implement

The main criterion for deciding whether or not to implement electronically operated licensing system is the level of computerization and internet access 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 also to HCFCs or / and other customs goods. Consideration of the cost to develop software, purchase hardware and train the personnel would be also important before any decision is made.



Status of implementation in selected countries

The European Union has an electronically operated import-export licensing system in place that includes all ODS, but so far not HFCs. In that system licenses are automatically verified, but random checks are conducted by the system operator (European Commission). The system includes also products and equipment containing ODS. Among developing countries e.g. Turkey and Grenada have developed an electronically operated import-export licensing system that includes HCFCs, but not HFCs.



Links and resources

- Information on the EU electronically operated licensing system for import and export of ODS and ODS-containing products and equipment can be found on https://ec.europa.eu/clima/policies/ozone/ods_en
- Information on iPIC procedure can be found on <http://www.unep.org/ozonaction/resources/informal-prior-informed-consent-mechanism>







3. OPTIONS RELATED TO RESTRICTIONS ON HFCs USE

3.1

Specific phase-down schedules and use bans for HFCs



General description

Establishing specific phase-down schedules and “use bans” is a highly recommended option that, if undertaken at an early stage, would definitely facilitate the HFCs phase-down.

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

- An ambitious revised phase-down schedule for all HFCs that would allow the reduction of HFC consumption ahead of the schedule set up in the Kigali Amendment, or
- Specific phase-down schedules for selected HFCs or selected groups of HFCs.

The first option, which treats all HFCs as a single basket of substances, is a simple approach that requires specific provision in HFC legislation and may be combined with use bans that help achieve the new consumption targets. The second option (specifying the bans or specific phase-down or phase-out schedules for selected HFCs) is a more complex exercise requiring certain preliminary steps, but which may have some advantages (see items 3.1.2 - 3.1.4 below). If this option is selected, the choice of order by which particular HFCs or particular groups of HFCs would be banned, phased-out or phased-down may be based on the one of the following principles:

- Their GWP value - phasing out higher GWP HFCs first, e.g. establishing the agreed phase-down date or earlier phase-down date for HFCs or HFC-containing mixtures with very high GWPs. The very first HFC to be banned would naturally be HFC-23 as it has extremely high GWP (14 800), followed by other HFCs e.g. HFC-236fa (GWP of 9 810), HFC-143a (GWP of 4 470), HFC-125 (GWP of 3 500), HFC-227ea (GWP of 3 220), or as well as HFC containing mixtures like e.g. R-507 (GWP of 3 985) or R-404A (GWP of 3 922) can be subject to a faster phase-down than the others. Alternatively, all HFCs or mixtures that have GWP of “X” or more can be subject to faster phase-down or ban.
- Their share in the country’s total HFC consumption expressed in CO₂-eq, i.e. their actual impact on country’s compliance with the Montreal Protocol phase-down schedules. That would be a challenge because in great majority of countries the most common HFC which has the greatest impact on country’s HFC consumption is HFC-134a. This substance is used in so many applications that it would probably be impossible to ban it totally. However, designing a specific phase-down schedule for HFC-134a or specific phase-out schedule for HFC-134a in certain applications may be an option.

Establishing “use bans” means in practical terms establishing deadlines after which the use of HFCs 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 very large in terms of quantities expressed in CO₂-eq
- where HFCs could be replaced most easily, faster or at a lower cost
- which are most emissive (solvents, aerosol propellants, fire extinguishing agents).

It is important to decide whether or not:

- the ban would apply to the whole sector (e.g. foam blowing) in which case there would be just one deadline for using HFCs in all applications in that sector (e.g. for blowing of all foams, including production of polyol blends or other pre-mixes 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.

A useful combination of the GWP-based option and the use-based option is establishing bans on certain applications, but specifying the upper GWP limit. For example, if the use of HFCs (or mixtures) with GWP of 2 500 or higher for servicing stationary refrigeration equipment is banned it would mean in practice banning the use of not only R-404A and R-507, but also R-422D.



Advantages / impact / benefits

The advantage of establishing either the specific HFC phase-down schedules and/or use bans for HFCs or a combination of both is that these options allow for smooth and well-controlled HFC phase-down 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 minimised.



Disadvantages / efforts / costs

The disadvantage of applying specific phase down schedules and/or use bans for HFCs 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 HFCs. This may create some additional cost, but it is a worthwhile investment to ensure smooth HFC phase-down.



Support measures required for effective implementation

Surveys of all industry sectors where the HFCs 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 facilitating the answer to 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? Such surveys have been undertaken in several Article 5 countries and the results are available through UN Environment regional offices.

Requiring that HFCs users maintain logbooks and report data to the competent authority (see “Mandatory HFC logbooks” option) will assist tremendously in the collection and further analysis of the country’s HFC use data. Moreover, the 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 HFC use bans or restrictions, the tool that would bring similar, but limited effect may be restricting public sector procurement to non-HFC (and also non-HCFC) products and equipment. However, one has to realize that such procurement rules called “green procurement” would apply only to the public sector. The private sector can only be encouraged to apply the same approach.



Criteria to define the most suitable implementation schedule

The specific implementation schedule will depend on the results of the data surveys and on the decision on which approach will be taken for either the selection of HFCs for establishing specific phase-down schedules or the selection of uses for the use bans. The general rule should be “the sooner the better” to ensure earlier compliance with the committed policy targets. However, it should be noted that the “use bans” are much more restrictive than “placing on the market bans” imposed on specific products or equipment (see “Restrictions on imports / placing on the market of products and equipment containing or relying on HFCs” option). It means that if, for example, the ban is to be established for the use of specific HFC in specific equipment type the ban on placing on the market of such equipment either containing or relying on that HFC should be introduced first in order to allow the relevant industry to be prepared for the use ban concerning that HFC.



Criteria for decision making to implement / not to implement

The criterion for whether or not to start the process of introducing the measures described in this section should be the realistic possibility of advancing the phase-down schedules for all (or some of) HFC gasses or phasing-down or even phasing-out selected uses faster if those are not crucial for country's economy.



Status of implementation in selected countries

The European Union has in place a phase down schedule for HFCs which is more restrictive than the one resulting from the Kigali Amendment. Regarding the use bans on HFCs in the EU Regulation 517/2014, there is a very important ban on the use from 1 January 2020 of HFCs with GWP of 2500 or more to service or maintain refrigeration equipment with a charge size of 40 tons of CO₂-eq or more, with certain exemptions. From 1 January 2017, the use of HFCs with GWP of 150 or more for filling the air conditioning systems in passenger cars installed after that date is prohibited in the EU based on Directive 2006/40. In Switzerland, the use of HFCs in foams has been banned and some other countries, e.g. United States or Japan, have in place a step-by-step system of phasing out specific HFCs from various uses, starting with those HFCs which have high GWP.



Links and resources

- General description of measures taken by various countries on HFC use can be found in :
 - D. Brack : National legislation on hydrofluorocarbons (2015) on http://www.igsd.org/documents/NationalLegislationonHydrofluorocarbons_9.11.151.pdf
 - D. Zaelke, N. B. Parnell and S. O. Andersen : “Primer on HFCs” (IGSD, August 2015) <http://www.igsd.org/wp-content/uploads/2015/10/HFC-Primer-18October2016.pdf>
- EU Regulation 517/2014 and Directive 2006/40 are available on https://ec.europa.eu/clima/policies/f-gas_en
- US legislation concerning HFCs is available on <https://www.epa.gov/snap/overview-snap>
- Composition of refrigerant blends can be found in SNAP document available on <https://www.epa.gov/snap/compositions-refrigerant-blends>
- Method of calculating the GWPs of HFC-containing blends can be found in the UN Environment OzonAction Factsheet Refrigerant blends. Calculating Global Warming Potentials” http://www.unep.org/ozonaction/Portals/105/documents/7786-e-Calculating_GWP_of_Blends_post_Kigali.pdf
- GWP values of the most commonly used mixtures containing HFCs can be found in ACRIN Brochure : “2014 F-gas regulation and GWP values” available on : <http://www.ior.org.uk/app/images/pdf/FGASRegulationGWPValues.pdf>
- UN Environment OzonAction “What Gas?” application.
- UN Environment OzonAction “GWP-ODP CALC” application.

3.2

Ban on new HFC installations



General description

Banning new HFC installations would reduce dependency on and demand for HFCs, especially if there is no ban on manufacturing and importing products and equipment containing or relying on HFCs – see “Restrictions on imports / placing on the market of products and equipment containing or relying on HFCs” option. In practice, such a ban on new HFC installations allows the continued operation of existing HFC installations, but no new installations relying on HFCs can be put in operation after a certain date, with some possible exemptions which have to be clearly defined. It means in practice, not only a prohibition on the installation or addition of new HFC-relying parts to any existing HFC equipment, but also a prohibition on the refurbishment of existing CFC or HCFC installations to operate with HFCs. National legislation introducing a ban of new HFC installations should include this clarification as otherwise new HFC equipment could be added to existing HFC, CFC or 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 RAC 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 HFCs is in this type of equipment.



Advantages / impact / benefits

A ban on new HFC installations would promote (or even enforce) the introduction of non-HFC technologies and thus facilitate the HFC phase-down. If the above definition of “new” is applied, such a ban would automatically stop the dumping of obsolete HFC-based technologies into the country. The advantage of introducing a ban on new HFC installations compared with a the general ban on manufacturing and import of HFC equipment (see “Restrictions on imports / placing on the market of products and equipment containing or relying on HFCs” option) 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 HFCs. In comparison, banning the “use” of HFCs in all installations in a particular sector (see “Specific phase-down schedules and use bans for HFCs” option) would be a much stricter approach since it would also cover existing HFC installations. A ban of new HFC installations would allow a smoother phase-out.



Disadvantages / efforts / costs

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



Support measures required for effective implementation

An essential support measure that would assist in the implementation of a ban on new HFC installations would be creating incentives for building new installations utilizing alternative technologies. Such incentives could include exemption from taxes (or decreased taxes) and providing financial support (grants, credits, loans, etc.). The continued use of existing HFC 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). In general, access to up-to-date information on non-HFC 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-HFC alternatives.



Criteria to define the most suitable implementation schedule

Introducing a ban on new installations that use HFCs would be an ideal measure to be introduced not later than at the date when the freeze in HFC consumption is set in the national legislation of the Article 5 country (i.e. as early as possible within the 2019-2023 or 2024-2027 period, depending on the freeze date applicable to the country concerned). The result would be that HFC consumption would not increase between then and 2024 or 2028, when the freeze starts. Therefore, it is highly recommended that the ban on new HFCs installations (with certain exemptions, if necessary) is implemented before the HFC consumption freeze enters into force for the country concerned.



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 HFC consumption is growing fast and which face a risk that the HFCs freeze in 2024 on average of 2020-2022 levels (Group 1) or in 2028 on average of 2024-2026 levels (Group 2) may not be achieved.



Status of implementation in selected countries

To date no country has introduced a ban on new HFC installations. However, those countries which have in place the ban on new HCFC installations may consider extending it to cover HFCs. An example which shows the advantages of introducing such ban may be the Polish experience with HCFCs. In 2004, Poland introduced a ban on extending the existing installations relying on HCFCs in the RAC sector and building new HCFC installations. The major objective of the ban was to prevent the continuous dumping of obsolete HCFC equipment into Poland. As a result, the consumption of HCFCs for servicing RAC equipment in Poland did not increase until 2005 and after this began to decrease what allowed Poland to meet the ban on using virgin HCFCs for servicing RAC&HP equipment in the EU commencing on 1 January 2010. Turkey introduced a similar ban on new HCFC installations and achieved similar results.



Links and resources

- Polish Act on ODS of 20.04.2004 (Polish J. of Laws 2004, No 121, item 1263)³³ available from : kozak@ichp.pl

³³ Now replaced by new ODS and F-gases Act of 15 May 2015 which supplemented the EU ODS and F-gas legislation which is mandatory for Poland.





4. OPTIONS RELATED TO RECORD KEEPING

4.1

Mandatory HFC logbooks



General description

In practical terms, maintaining logbooks entails making notes on 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 type of data are to be placed in the logbook and the format to be applied.

Best practices in logbook keeping include the following:

- The entities covered should include HFC importers and exporters, HFC users³⁴, those entities who place HFCs on the market (i.e. HFC dealers)³⁵ and those entities who recover, recycle or reclaim HFCs. If there are destruction facilities in the country, the entities that destroy HFCs should also be included. It is recommended that producers, importers and exporters of products and equipment containing HFCs are also required to keep HFC logbooks. It is also recommended that maintaining the substance logbooks is mandatory not just for HFCs but also their alternatives.
- One logbook is kept for each type of HFC (or HFC-containing mixture).
- The data to be placed in the logbook should include at a 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 HFC (importing, exporting, selling, buying, using – specifying for what purpose, recovering, recycling, reclaiming) and the quantity of HFCs 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 (which concern only importers and exporters).
- The logbooks can be maintained either in a paper form or in an electronic form. The latter is much easier for daily operation, but requires software development and appropriate computer equipment. If data are reported electronically (see “Mandatory reporting by HFC importers and exporters” section) maintaining the electronic logbooks would facilitate reporting.



Advantages / impact / benefits

Mandatory HFC logbooks facilitate the monitoring of how the provisions of the HFC legislation are being followed by the relevant entities. If the logbooks are supplemented with reporting requirements the data thus acquired by the competent authority allow for effective monitoring of HFC flow to/from the country and within the country, as well as making best estimates of quantities of HFCs used in particular sectors, and also of HFC quantities being recovered, recycled and reclaimed. The HFC quantities destroyed or sent for destruction can also be noted in the logbook. No other measure can be so effective to ensure appropriate HFC management, which is required to achieve a smooth and successful phase-down. It will be most useful when a country decides to phase down HFCs on a use-by-use basis. Another important benefit is that engagement

³⁴ The term “use” should be defined in the relevant legislation if HFCs “users” are to be covered by the mandatory logbook system. “Users” would not mean equipment operators who only exploit the equipment and do not service it with HFCs (i.e. do not use HFCs for servicing).

³⁵ The term “placing on the market” should be defined in the relevant legislation if those who place HFCs 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 HFC” option.

in this system will increase the awareness of the relevant entities of the need for diminishing significantly or even eliminating their demand for HFCs in the future.



Disadvantages / efforts / costs

Establishing the requirement for keeping HFC logbooks that would involve many entities and also reporting by those entities would translate to a greater administrative burden (and cost) for the entities involved (and for the competent authority, if reporting is also required), but it would be worth the effort, taking into account inevitable advantages.



Support measures required for effective implementation

A substantial support measure to supplement the mandatory keeping of HFC logbooks is a reporting requirement by all who are involved in that system. Reporting should be done by a specific deadline, (e.g. 28 February or 31 March of the consecutive year) and the reports should be sent to the competent authority (or the institution authorized by that authority) that will operate the database. Optionally, the logbooks can be kept in a Central Electronic Database with a website created specifically for that purpose and the reports may be sent to the competent authority on-line (see the example of such database in "Mandatory reporting by HFC importers and exporters" option on page. 53) A simplified approach can be that the logbooks are not mandatory, however reporting to the competent authority is done on-line by importers, exporters and other entities above through the dedicated website.

A very useful support measure, especially if the electronic logbook or/and reporting system is established, is the organization of short training workshops for the particular groups of entities involved (e.g. representing particular sectors).

If the country has not yet established equipment logbooks for HCFCs an obvious support measure would be that the system of substance logbooks could cover both HFCs and HCFCs as well as their alternatives.



Criteria to define the most suitable implementation schedule

If the country decides to implement this measure, it should be done promptly (at a freeze date or soon after) since some time may be needed for all relevant entities to join the system.



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 HFC use. If the country is committed to stricter controls on HFCs and will phase out those chemicals as soon as possible, implementation of mandatory keeping of HFC logbooks, optionally supplemented with mandatory reporting by the entities involved, will be a great step towards that goal.



Status of implementation in selected countries

Based on the European Union Regulation 517/2014, undertakings that sell HFCs to third Parties for the purpose of installation, servicing or maintenance or repair of equipment shall keep records of the purchasers containing their names and the relevant certificate numbers as well as names and quantities of the substances sold. Also HFC equipment operators³⁶ and undertakings which conduct installations for them, servicing or maintenance, recovery, leakage checking, repair or decommissioning of HFC equipment are obliged to keep for 5 years records of the relevant activities unless there is a Central Database in place which is managed by the competent authority of the EU Member State. The same Regulation imposes an obligation on sellers of equipment pre-charged with HFCs which is not hermetically sealed to request evidence from purchasers

³⁶ Equipment operators may keep those data in equipment logbooks.

that the installation of such equipment is done by appropriately certified technician. It is then obvious that the seller will also have to keep register of purchasers of such equipment.

As it was already mentioned in “Mandatory reporting by HFC importers and exporters” section there is an electronic database in Poland where the annual reports are submitted by the entities that import, export, use, recover, recycle, reclaim or destroy ODS or F-gases and also by the entities that manufacture, import or export products or equipment containing ODS or F-gases. Data submitted to that database are then analyzed by the institution listed in the relevant legislation and are presented to the competent authority. However, no formal requirement of keeping substance logbooks by the entities obliged to report is in place.

In Macedonia FYR a complex electronically operated database has been established where the servicing technicians, service shops and equipment owners are obliged to register and where data on quantities of refrigerants (HCFCs, HFCs and alternatives) used for servicing as well as quantities of those refrigerants recovered, recycled or reclaimed are stored and can be analyzed. The registration page for servicing technicians is shown in Fig. 8 and the sample report by the service shop on refrigerant recovery, recycling and reclamation is shown in Fig. 9.

Fig. 9. Registration page of servicing technicians in the refrigerant database conducted in Macedonia (courtesy of FYR Macedonia NOU)

The screenshot displays a web application titled "REGISTRATION OF SERVICE SHOPS SERVICE TECHNICIANS". It features a navigation menu with "Service Shops" and "Service Technicians" tabs. The "Service Technicians" tab is active, showing a "List of technicians" table and a form for adding a new technician.

Form for adding a new technician:

- First and Last name: Горан Давкови
- Service Shop Name: Фриохитима
- E-mail: frigoitima@yahoo.com
- Phone / Mobile #: 078/406-077
- Date of Training: 07.02.2013
- Certificate Category: Категорија А
- Certificate Number: 27/2013
- Date of Examination: . . .
- License Category: [Dropdown]
- License Number: [Empty]
- Notes / Comments: [Empty]

List of technicians table:

ID	Technician name	Service shop	email	Phone	Training date	Certificate	Certificate number	Date of exam	License
130	Адам Косиќ	ОПЗ Термодинамика		010/224-489	26.06.2014	Категорија А	110/2014		
130	Адам Малеќ	Фриохитима Доел		013/482-545	21.02.2013	Категорија А		05/2013	
237	Александар Вангеловски	КлимаСервис Про		0	26.06.2014	Категорија А		217/2014	
273	Александар Георгиевски	Гол ЕЛ Тореја		016/710-321	20.09.2013	Категорија А		138/2013	
20	Александар Делчевски	Стартер Фоле		010/224-811	13.10.2011	Категорија А		16/2011	
89	Александар Димитровски	ЛТД Динка		010/253-886	09.11.2011	Категорија А		05/2011	
237	Александар Димитровски	Сервис Термо Маки		015/106-196	28.02.2013	Категорија А		07/2013	
238	Александар Илиќ	Екс Темпа		013/221-558	07.03.2011	Категорија А		112/2011	
483	Александар Јевановски	ЛН ООС		010/324-525	25.03.2013	Категорија А		246/2013	
234	Александар Нумановски	Термо-М		016/224-903	28.02.2013	Категорија А		04/2013	
88	Александар Малеќ	Контракс		010/219-111	31.01.2013	Категорија А		05/2013	
353	Александар Митревски	Комфор Клима		013/248-290	06.11.2014	Категорија А		233/2014	
216	Александар Павлевиќ	Мастер Ваздар Тех.	alexanderpav...	010/224-878	04.03.2013	Категорија А		123/2013	
289	Александар Пецев			0	28.12.2013	Категорија Ц		00/2013	
312	Александар Поповиќ	Аиркон	design@aircon...	077/693-855	11.06.2013	Категорија А		186/2013	
482	Александар Симоновиќ	КлимаСервис Термокс		010/295-826	09.06.2013	Категорија А		064/2013	
81	Александар Стефанов	Ифооет	alexanderst...	013/377-057	15.12.2011	Категорија А		78/2011	
424	Александар Чваровиќ			0	28.11.2013	Категорија Ц		46/2013	
410	Алексовски Боран	Елеџ Бетона	zokibkola@no...	015/201-342	10.06.2013	Категорија А		245/2013	
465	Анел Милевски	Техно Авто Окопје		010/366-940	25.03.2013	Категорија А		150/2013	
452	Антони Сѓаѓиќ			0	04.11.2013	Категорија Ц		12/2013	
343	Антони Тоѓановски	КлимаСервис Про		0171624-707	25.06.2014	Категорија А		223/2014	
487	Арчи Веќи	Ифооет		015/793-228	28.06.2011	Категорија А		274/2011	
390	Атанас Иванов			0	04.12.2013	Категорија Ц		317/2013	

Fig. 10. Sample report by service shop on refrigerant recovery, recycling and reclamation form refrigerant database conducted in Macedonia FYR (courtesy of Macedonia FYR NOU)

REPORT ON THE TYPE OF QUANTITIES OF RECOVERED, RECLAIMED AND RECYCLED REFRIGERANTS

REPORT ON THE TYPE OF QUANTITIES OF RECOVERED, RECLAIMED AND RECYCLED REFRIGERANTS

Report form

Reporting year: 2016

Service shop / Natural person: Service shop address: Person in charge: **Stefan Mapevski**

Global Recycle: [dropdown]

Name of recovered refrigerants	Quantity of recovered refrigerants (kg)	Quantity of reclaimed refrigerants (kg)	Quantity of recycled refrigerants (kg)	Quantity of generated waste (kg)
R12	0	0	0	0
R134A	300	0	270	30
R22	221	0	203	20
R404A	525	0	480	45
R407C	62	0	52	10
R410A	30	0	24	6
R417A	0	0	0	0
R507A	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0

Date: 26.02.2017 Place: [dropdown] Person in charge: **Stefan Mapevski**

Verification number: [input] Verified by: [input]

Searching record

Reporting year: Verification number:

Service shop: [input] Search

List of records:

Year	Service Shop	Verification number
2016	Аге Сепар - ...	
2016	Меншир Сеп...	
2016	Еуро-Техно Д...	
2016	Иона ЕкоТех	
2016	ТехноСко	
2016	ЕуроСкоп Д...	
2016	НСМ Сепар К...	
2016	Контакт 2000	

Add Save Update View records Exit



Links and resources

- EU Regulation 517/2014 is available on https://ec.europa.eu/clima/policies/f-gas_en
- The website of Central Database of Reports established in Poland is www.bds.ichp.pl. More information can be acquired from Prof. Janusz Kozakiewicz kozak@ichp.pl
- The website of Macedonian NOU is <http://www.ozoneunit.mk/home/> and more information can be obtained from Ms Natasha Kochova n.kochova@ozoneunit.mk



Mandatory HFC equipment logbooks



General description

The main role of HFC logbooks described in “Mandatory HFC logbooks” option on p. 53. is capturing data on the flow of HFCs in the country starting from the moment they are produced or cross the country borders, until the moment they are used, exported or destroyed. The main purpose of equipment logbooks, however, is to provide data on HFC emissions that can help to verify the compliance with obligations related to HFC recovery from larger equipment and to leak checking of such equipment. If the equipment logbooks are also mandatory for equipment containing HFC substitutes then additional information can be acquired on the local market penetration of new alternative technologies. There are also other important advantages of keeping equipment logbooks – see p. 58 for details.

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 the fire protection sector or solvent sector where equipment containing HFCs is also exploited?

It is recommended that the main sector to be considered is refrigeration, i.e. refrigeration, air-conditioning and heat pump equipment, so that intentional venting of refrigerant during servicing and maintenance operations is prevented. The inclusion of the fire protection sector where HFCs with quite high GWP values are used is very useful while the solvent sector is very small in most of Article 5 countries, and so may not necessitate keeping logbooks.

Question 2: What should be the lower limit of the refrigerant charge in the equipment to require keeping logbooks?

The EU, for example, defined 5 tons of CO₂-eq as the lower limit. However, countries may opt for even lower limits, e.g. 1 ton of CO₂-eq in order to cover smaller equipment. However, in this case equipment containing only 0.70 kg HFC-134a or 0.47 kg R-410A for example will be included. It is recommended that equipment charge is expressed in CO₂-eq because the HFC phase down schedules are set up in such units, but the country may as well decide to keep logbooks starting from e.g. 3 kg of HFCs contained in equipment (as it was recommended for HCFC equipment logbooks). Some experts argue that excluding smaller equipment 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 hundreds of thousands of pieces of equipment to be included in the logbook system, which could be difficult to manage.

Question 3: What kind of equipment is to be covered – both stationary and mobile or just stationary?

Most experts agree that the highest leakage rates occur in mobile equipment, but it is more difficult to manage the logbooks for such equipment. In the EU for example, HFC legislation logbooks are generally mandatory for stationary equipment and only for big refrigerated trucks and trailers (weighing more than 3.5 tons).

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. If the military sector is included in the system of data collection from equipment logbooks, it is usual practice that the dedicated military institution collects data from all equipment users situated in military sector and submits only aggregated data to the authority which is responsible for data analysis.

Question 5: What kind of data should the equipment logbook contain?

As an example, the European Union Regulation 517/2014 on F-gases requires the following data: type of equipment, name of its user (called “operator”)³⁷, F-gas charge, quantity and type of F-gas 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 leakage checking, servicing or maintenance, repair or decommissioning, dates and results of conducting those operations including reasons for leakage if any leakage was found.

³⁷ In the European Union Regulation 517/2014 the term “equipment operator” has been defined. Equipment operator is a legal or natural person who exercises the actual power over the technical functioning of the equipment. In practice the equipment operator is the entity which is actually exploiting the equipment or is its owner. It seems quite useful that the countries who wish to implement the equipment logbooks for HFCs introduce also that term in their legislation.

Question 6: What could be the structure of the data reporting system if data reporting is required?

Efficient data reporting would require a central electronic system, e.g. a website, which would facilitate data recording and transmission to the National Register of Equipment Operators, an electronic database 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 or reporting systems (see “Electronically operated licensing system for HFCs” option on p. 60 and “Mandatory reporting by HFC importers and exporters” on p. 53). The website would be managed by the National Register Administrator designated by the competent authority.

**Advantages / impact / benefits**

Mandatory HFC equipment logbooks, similar to the mandatory HFC logbooks, facilitate the verification of compliance with the provisions of national HFC legislation by the relevant stakeholders (in this case – equipment users). If the equipment logbooks are supplemented with reporting requirements, the data collection system thus created will allow for effective monitoring of HFC quantities being recovered and HFC quantities being added to the equipment. Such data can be used to calculate actual emissions/leaks from particular types of equipment. The creation of a National Register of Equipment Operators would allow the competent authority to learn where HFC are installed in the equipment in the country and in what quantities. It also allows the competent authority to monitor whether leakage checking and leakage repair has been conducted and whether all operations on the equipment were done by appropriately qualified (usually – appropriately certified) personnel. The competent authority may also be able to monitor the installation of new and decommissioning of old HFC equipment units and, if appropriate, their replacement with the ones which will be using alternative substances. Data obtained from the equipment logbooks may be cross-checked with data obtained from HFC logbooks, so more reliable information on HFC recovery rates and HFC emissions is obtained.

**Disadvantages / efforts / costs**

Introducing mandatory HFC equipment logbooks would involve many equipment users (operators) nationwide, all of whom would be required to report data unless there is central electronic database (National Register of Equipment Operators) established where all data will be available on-line to the competent authority. Otherwise reporting would result in additional administrative work for the entities involved (and for the competent authority) but the numerous advantages of the equipment logbooks system should be an incentive. If a National Register of Equipment Operators is created it would also include the cost associated with development and operation of the system, but it would be worth that effort.

**Support measures required for effective implementation**

If the logbooks are not part of an electronic on-line system (Central Register of Equipment Operators), the mandatory HFC equipment logbook keeping would require reporting by all who are involved in that system (see p. 57 for suggested design of the reporting system). The instruction manuals have to be drafted and users of equipment monitored by the equipment logbook system should receive training. If the creation of a National Register of Equipment Operators is decided, the same register could also include end users of other F-gases (e.g. operators of electrical switchgear equipment containing SF₆) as well as HCFCs (and optionally also CFCs and halon) equipment. The option of including the equipment containing HCFC and HFC alternatives in the logbook system may also be considered, however the note made in the HFC logbook on changing to specific alternative technology and closing the logbook may be sufficient to provide information on market penetration of new alternatives.

**Criteria to define the most suitable implementation schedule**

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



Criteria for decision making to implement / not to implement

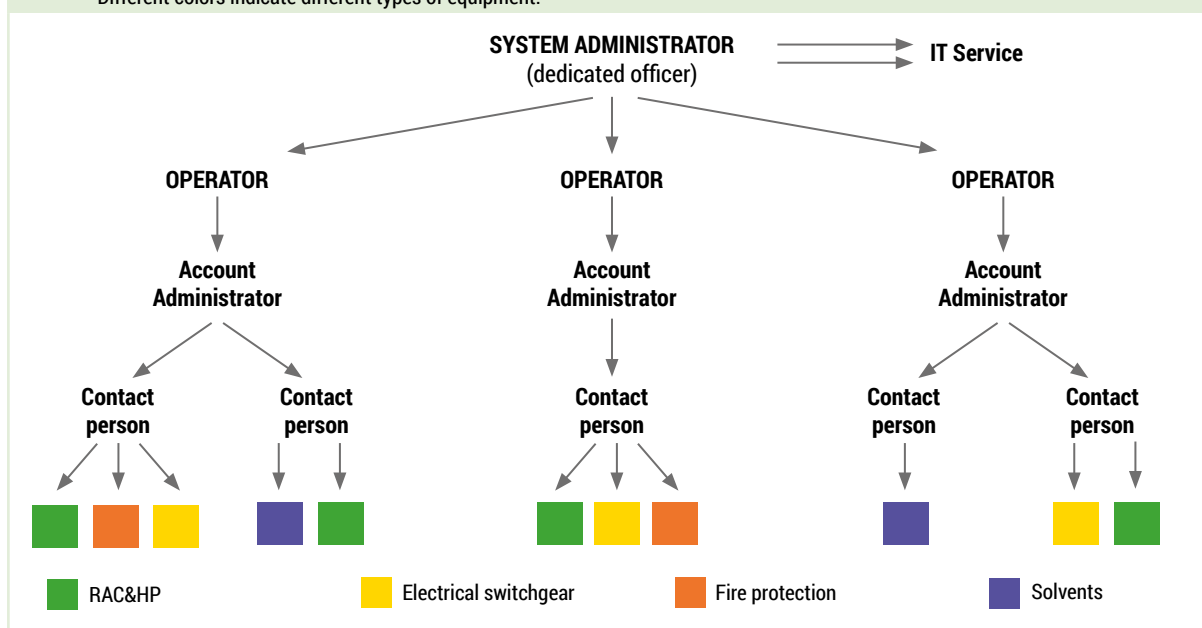
The main criterion for decision makers would be the level of ambition with regard to monitoring the use of HFCs in installed equipment installed in the RAC sector (and also in fire protection and solvent sectors, if HFCs are used there). It should be noted that lower emissions mean reduced demand for HFCs (see “HFC emissions control measures” option on p. 47 for details), so any measure that allows for limiting the emissions may be considered as part of HFC phase-down policy.



Status of implementation in selected countries

In a number of countries including India and several Article 5 and countries with economies in transition (CEIT) in Eastern European and Central Asia the registration of users of HCFC equipment is mandatory, so it would be relatively easy to extend this obligation to users of HFC equipment. However, there are no reporting requirements by those entities and no relevant central electronic databases are in place. In the EU legislation there is a requirement for operators of RAC&HP, fire protection and electrical switchgear equipment holding 5 tons of CO₂-eq or more to keep equipment logbooks containing data on operator, substance, equipment and all activities conducted on equipment, but there are no instructions on the logbook format. Some European countries e.g. Poland, Estonia or FYR Macedonia have established the electronic logbooks databases in the form of National Registries of Equipment Operators which are administered by the competent authorities (FYR Macedonia) or designated institutions (Poland, Estonia) and work successfully. The logistic structure of Central Register of Equipment Operators where the operators of any equipment containing 3 kg or more of ODS or F-gases³⁸ must register and keep logbooks is shown in Fig. 10 below.

Fig. 11. Logistic structure of Central Register of Equipment Operators electronic database established in Poland. Different colors indicate different types of equipment.



The operator has to nominate a person called “account manager” who will make on-line registration of the operator in the system (i.e. will create the operator’s account there). After the registration is approved by the dedicated officer from the institution which administers the system, the account manager will be obliged to set up a separate logbook for each piece of equipment holding 3 kg or more (or 5 tons of CO₂-eq or more) of ODS and F-gases the operator has got. The account manager is able to nominate other persons (called “contact persons”) who will have access to the system and who may be responsible for a specific logbook or for a number of logbooks. Each logbook contains the coordinates of operator and equipment manager/contact person and data concerning the equipment (equipment type, exploitation address, type and quantity

38 Starting from 1 January 2018 the limit for F-gases will be changed to 5 tons of CO₂-eq.

of ODS/F-gas it contains). The logbook will also allow the servicing technician with certificate to make on-line notes on any activity he conducted on equipment (leakage checks, recovery/topping up of ODS/F-gas³⁹, repair, installation, decommissioning). Currently, approximately 30,000 equipment operators and 230,000 pieces of equipment installed in Poland are covered by this system.

The system is designed to generate reports for the system administrator which will contain several sets of aggregated data from the logbooks. Such reports allow the competent authority to acquire information on e.g. quantities of particular type of ODS or F-gas (including mixtures) contained in particular type of equipment, number of pieces of particular type of equipment holding 3 kg or more (or 5 tons of CO₂-eq or more) of ODS/F-gas, quantity of particular ODS/F-gas recovered from or added to particular type of equipment, total number of operators and numbers of operators of particular type of equipment holding particular type of ODS/F-gas, location of particular type of equipment in the country, etc. The system also allows the equipment operator to produce similar reports, but containing only the data concerning that particular operator's equipment. A recommended format of a HFC equipment logbook based on the format of the electronic F-gas logbook mandatory in Poland is included in Annex 4 to this booklet.

As it was mentioned in section concerning HFC logbooks, in FYR Macedonia a complex electronically operated database has been established where the servicing technicians, service shops and equipment owners are obliged to register and where data on quantities of refrigerants (HCFCs, HFCs and alternatives) used for servicing as well as quantities of those refrigerants recovered, recycled or reclaimed are stored and can be analyzed. The registration page for refrigerant equipment owners is shown in Fig. 11 and a sample equipment logbook is shown in Fig. 12.

Fig. 12. Registration page of refrigerant equipment owners in the refrigerant database conducted in FYR Macedonia (courtesy of FYR Macedonia NOU)

The screenshot shows a web application interface for 'EQUIPMENT OWNERS'. It includes a form for adding a new owner with fields for name, VAT number, city, address, contact person, phone, fax, mobile, email, and website. There are also buttons for 'Add', 'Save', 'Update', and 'Exit'. A search bar is present on the right. Below the form is a table listing existing equipment owners.

ID	Owner	VAT num.	City	Owner Address	Eq. is situated in	Contact Person	Phone	Fax	Mobile	email	web	Note
41	Метропол АД Скопје	0	Скопје	Населба Кочино бб.	Скопје	Александар Каласки	+389)4...	+389)4...	078/223...	alexandar@...	http://...	
40	Македон Доел	0	Гевгелија	Трнанин премин...		Атанас Прошев	034/230...	034/230...	075/474...	maintenanc...		
39	Сити Плаза Доо...	0	Скопје	Бул. Јане Санданс...	Капитал мол	Бојан Ристески	032455...		072/783...	bojan@cityp...		
38	"Вивел Пром" - Ва...	0	Ботевци	Ул. Мршал Тито бр...		Васил Амилов		034/323...	076/247...	viviprom@t...		
37	А.Д. Македонија ...	0	Скопје	Ул. Орце Николов ...	Македонија пошта	Емилија Милова			076/200...	emilija.mil...		
36	Марин Кочов	0	Скопје			Марин Кочов						
35	ИМП Солета	0	Скопје	Ул. 1892 бр.3, Ско...	Фабрика за прера...	Свето Илијевски			078/402...	soletami@g...		
34	Fatstone Maked...	0	Скопје	Ул. Свети Кирил и ...		Ариф Миџтар Мун...	03)3178...	03)3178...	071/237...	arifm@rams...		
33	Лонде Комерц...	0	Прилеп	Ул. Благоја Шукур...		Курче Ангелески	048/413...		076/259...	lyonde1@yu...		
32	ОНЕ ВИП ДОО Ско...	0	Скопје			0						
31	Реплек Ферри ДОО...	0	Скопје	Ул.Нолле 188		Василко Беава, Б...	02)3081...		071/304...	vasilko.bea...		
30	ДОП Везе Шире	0	Тетово	с.Трошош, Желино		Крсте Поповски	044)368...	044)368...	071/247...	krste@vezes...		
29	Шпаркас Банка ...	0	Скопје	Ул.Македонија 9/1...		Љубен Бабе			071/395...	sub@sparka...		
28	Импексел 2	0	Скопје	Ул.Орце Прица б...	Кална гаража - Ул...	Немил Кусенин			076/215...	contact@im...		
27	Македонски Нар...	0	Скопје	Ул.Иљо Војвода бб.		0	02)3236...			info@mnt.mk		
26	Репро 21 - ПЗУ Р...	0	Скопје	Ул. 16-та Македон...	Ремедики	Драган Силјановск...			072/443...	d.siljanovski...		072/443...
25	Скопин АД, Скопје	0	Скопје	15-ти Корпус бр.3		Борги Ташибошкови	02)3145...		075/414...	hadziboskov...		
24	Евекит Груп Доел	0	Штип	Брегалница 54		Филип Блажевски			072/271...	filip@eximit...		

³⁹ In Poland (and in all other EU Member States) topping up the equipment with ODS is not permitted.

Fig. 13. Sample refrigerant equipment logbook (courtesy of Macedonia FYR NOU)

Records for recorded and labeled equipment

RECORDS FOR RECORDED AND LABELED EQUIPMENT

Evidence number *
0100

Registration date
28.10.2014

Service shop name
Информатика

Technician name *
Лубимир Цунески

Equipment owner *
Принцес Казино ДООЕЛ

City where equipment is placed
Гетемље

Region

Log-book number
0100

Equipment name *
Ладилни агрегат-фриџер

Equipment model
RAR 8002 KA SP

Equipment serial number
09K08

Equipment manufacturer *
York

Manufacturing year *
2009

Purpose of equipment *
Климатизација

Type of equipment *
Стационарна

Вестор *

Услуга и уградничество

Хотел - казино

Refrigerant *
R134A

Type of refrigerant
RFC

Cooling capacity *
800,000 [KW]

Type of compressor *
Herzoteknika

Installed power capacity *
800,000 [KW]

No. Refrigerant Circuits
2

Total refrigerant charge
800,000 [KGR]

GWP
CO2

Equipment status
Labeled Active

Notes / Comments
два ладилни фриџерни круга, 150 kg. во круг опомната е сместена во Гетемље

Image IMAGE SIZE max W300 px x H210 px
Picture source
E:\OZONE UNIT MAKEDONIA\0100.com
Picture name
Princes Casino 0100 soft.jpg

SHORT LIST OF RECORDS

ID	Evidence number	Service Shop	Technician name	Owner	Evidence log No.
992	1603/2016	Засил Единице	Тр рајс		1603/201
993	1604/2016	Засил Единице	Тр рајс		1604/201
994	1605/2016	Засил Единице	Тр рајс		1605/201
995	1606/2016	Засил Единице	ТБД компани		1606/201
996	1607/2016	Засил Единице	Атлантик Дроел		1607/201
997	1608/2016	Засил Единице	Центар за кадров		1608/201
998	1609/2016	Засил Единице	Технометал		1609/201
999	1610/2016	Засил Единице	Технометал		1610/201
1000	1611/2016	Засил Единице	Технометал		1611/201
1001	1612/2016	Засил Единице	Ореос Лад		1612/201
1002	1613/2016	Засил Единице	Ореос Лад		1613/201
1003	1614/2016	Засил Единице	Ореос Лад		1614/201
1004	1615/2016	Засил Единице	Угитур		1615/201
1005	1616/2016	Засил Единице	Угитур		1616/201
1006	1617/2016	Засил Единице	Угитур		1617/201
1007	1618/2016	Засил Единице	Угитур		1618/201
1008	1619/2016	Засил Единице	Угитур		1619/201
1009	1620/2016	Засил Единице	Номесујална Еб...		1620/201
1010	1621/2016	Засил Единице	Номесујална Еб...		1621/201

Search records:
Equipment owner: Technician name: Evidence number: Search



Links and resources

- The website of Central Register of Equipment Operators established in Poland is www.cro.ichp.pl. More information can be acquired from Prof. Janusz Kozakiewicz kozak@ichp.pl
- EU Regulation 517/2014 is available on https://ec.europa.eu/clima/policies/f-gas_en
- The website of Macedonian NOU is <http://www.ozoneunit.mk/home/> and more information can be obtained from Ms Natasha Kochova n.kochova@ozoneunit.mk





5. OPTIONS RELATED TO PREVENTING HFC EMISSIONS

5.1

HFC emission control measures



General description

HFC emission control measures are not included in the Montreal Protocol, but it is obvious that the climate will benefit from the control of HFC emissions from products and equipment.

The substantial approach would be:

- Establish penalties for intentional venting of HFCs to the atmosphere
- Make leak checking mandatory for larger equipment containing HFCs (recommended options could be 3 kg or more or 5 tons of CO₂-eq or more), establish a leakage checking schedule depending on equipment capacity and requiring installation of leak detectors for very large capacity equipment,
- Make the recovery of HFCs 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 which sectors should be covered by mandatory leak checking and mandatory HFC recovery. General emission restrictions can be applied to all sectors where HFCs 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.

Another approach to limit HFC emissions may be imposing bans or restrictions on the most emissive uses (solvents, aerosols, fire protection) – see “Specific phase-down schedules and use bans for HFCs” option on p. 47 for details. Such bans or restrictions may be introduced in parallel with measures described here.



Advantages / impact / benefits

HFC emission control measures would help in diminishing demand for HFCs in the country. More HFCs remaining in equipment means less HFCs needed to refill the equipment and thus this will contribute to protecting the climate. An additional benefit for the country would be the availability of certified personnel and companies.



Disadvantages / efforts / costs

Introducing the measures 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 HFCs are used, but also from the users of equipment containing HFCs. 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).



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 equipment containing HFCs (e.g. for stationary refrigeration and air conditioning equipment, for transport refrigeration and possibly also for fire protection systems if HFCs are used there). Raising awareness of the relevant personnel and of the general public of the need to avoid emissions of HFCs (see “Awareness raising of stakeholders” option on p. 73) would also be useful in achieving the objective of introducing emission control measures. A very effective measure may also be imposing fees for emissions. Such fee may or may not depend on the GWP of the substance or mixture that has been released, but has to be high enough to discourage intentional venting and encourage introduction of equipment containment measures. If emission fee for HFCs is established it should be accompanied with similar fee for CFCs, HCFCs and other ODS.



Criteria to define the 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. It is recommended that the emission control start to accompany ratification of the Kigali Amendment since it will automatically raise awareness of the end users in the relevant sectors and would help in diminishing the demand for servicing the equipment with HFCs. If emission control of both HCFCs and HFCs has been decided, measures regarding HCFCs and HFCs can be implemented at the same time.



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.



Status of implementation in selected countries

In a number of countries around the globe certain measures have been introduced to limit emissions of greenhouse gases, including HFCs. Just a few examples are quoted below.

In the European Union there are strict rules regarding leakage control of stationary RAC&HP equipment, refrigerated trucks and vans and fire protection equipment which contains HFCs and equipment operators are responsible for following those rules. Venting of HFCs is banned, leakage testing has to be conducted by certified personnel, specific leakage testing procedures are mandatory to be followed and special standard leakage test has been developed for mobile air-conditioning units. Additionally, in Germany leakage limits from various types of equipment have been established.

In the United States, it is also prohibited to vent the refrigerant knowingly and standards are established for recovery and recycling equipment used in mobile air conditioning sector as well as for proper management of that equipment. Greenhouse gas emission standards from various types of vehicles have also been established.

Japan introduced the revised Act for Rationalized Use and Proper Management of Fluorocarbon in 2015, which includes certain measures related to HFC emissions reduction, e.g. concerning reduction of leakage from RAC&HP equipment during its exploitation through, *inter alia*, mandatory leakage checks and repair of the leaking equipment.

In Canada, the release of HFCs and ozone depleting substances from specified sources is prohibited and HFC recovery from closed systems is mandatory. A code of practice which concerns HFC refrigerants is being updated to incorporate new technologies and best practices to reduce emissions.

Colombia established maximum emission limits for greenhouse gases, including HFCs.

Some countries have already introduced fees for emissions of HFCs (and ODS). E.g. in Poland the fee for emission of HFCs (and PFCs) amounts to 7.5 Euro/kg while the fee for emission of HCFCs – 15 Euro/kg and for other ODS – 47.5 Euro/kg.



Links and resources

- Information on measures undertaken in a number of countries in order to diminish HFC emissions is contained in the Ozone Secretariat document UNEP/OzL.Pro.28/11 <http://conf.montreal-protocol.org/meeting/mop/mop-28/presession/English/MOP-28-11E.pdf>







6. OPTIONS RELATED TO CAPACITY BUILDING AND AWARENESS RAISING

6.1

Training of customs and environmental officers



General description

So far training programmes for customs and environmental officers conducted in Article 5 countries have focused mainly on the monitoring and control of ODS (specifically HCFCs) since, until recently, no control measures related to HFCs were internationally accepted. Once the phase-down schedule for HFCs in Article 5 countries was agreed upon in 2016 through the Kigali Amendment, situation changed and those countries are now not allowed to exceed their HFC baseline consumption from 2024 (Group 1) and from 2028 (Group 2) and are obliged to establish HFC import/export licensing system by 1 January 2019 (unless a delay will be justified by the country and accepted by the Montreal Protocol Parties).

Even in the absence of mandatory monitoring of HFC imports and exports the current training programmes, which are focusing mainly on HCFCs, usually contain also some information on HFCs because HFCs are major HCFCs replacements and HCFCs are frequently shipped under the name of HFCs in order to avoid licenses and stricter controls by the customs.

Nevertheless, in view of the provisions concerning HFC licensing contained in the Kigali Amendment, new training programmes need to be designed in order to train new customs and environment officers on monitoring and control of HFCs including detection of HFC consignments at the border check-points. Customs officers need to be aware of the new HFC-related requirements under the Montreal Protocol as well as national legislation, licensing system, quotas and bans related to HFCs and HFC-containing equipment/products. At present only few Article 5 countries started the process of adjusting national legislation according to the new Montreal Protocol provisions related to HFCs and adopting relevant administrative, legal and institutional measures accordingly. However, that process will soon be undertaken in the other Article 5 countries and all those countries which applied quotas and licenses to HFCs need appropriate training of customs and environmental officers that will ensure effective trade and border controls and prevent illegal trade of HFC and HFC-containing equipment/products, and thus facilitate compliance with the Montreal Protocol.

Similar to previous training programmes, the HFC-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. Only those trained customs and environment officers who successfully passed the examination/test should be registered and receive the relevant certificates. The frequent practice of handing out participation certificates without checking the knowledge and practical skills of the participants is not recommended.

Attempts on illegal trade of HFCs can be anticipated once legal trade of HFCs is restricted. Lessons learned from CFC and HCFC smuggling operations should provide much assistance. Second hand equipment may be exported ("dumped") from countries which no longer allow the use of HFCs (virgin, reclaimed or recycled) or which are replacing HFC-based manufacturing equipment, building chillers, etc. As HFOs and hydrocarbons (HCs) seem to become commonly-used alternatives to HFCs and HCFCs, the relevant information may be included in customs training manuals and be delivered during customs trainings so the customs will be aware of the possibility that HFCs, HCFCs and HFC-containing or HCFC-containing blends may be shipped under the names of HFOs and HFO-containing blends as well as under the names of HCs.



Advantages / impact / benefits

The availability of appropriately trained customs and environment officers is a pre-condition for effective control and monitoring of HFC-related trade including products/equipment. Such training would also strengthen the links between enforcement bodies and environmental authorities. The training, if well designed, will provide all necessary information regarding HFCs and their alternatives and the issues related to identification of HFCs and possible illegal trade both in bulk HFCs and in products and equipment containing or relying on HFCs.



Disadvantages / efforts / costs

There is no disadvantage of conducting customs officers trainings. 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 projects financed by the Multilateral Fund. It may not be necessary to organize a separate training devoted only to HFC monitoring and control. It would be much more economical to supplement the current customs and environmental officers training programmes focused on HCFCs with information on HFCs (and HFOs/HCs).



Support measures required for effective implementation

An important support measure would be publication of an updated manual for customs and environmental officers in national language where all aspects of new legislation involving HFCs will be covered. Other effective support measures include the organization of workshops for stakeholders directly involved in the process of HFC phase-down, i.e. for importers, exporters, dealers and users of HFCs – see also “Awareness raising of stakeholders” option on p. 73 - or the participation inter-regional initiatives such as the informal Prior Informed Consent (iPIC) mechanism⁴⁰.

Since so far all HFCs are classified under one HS code together with some other chemicals (2903.39)⁴¹ and HFC-containing mixtures have only one code in HS system (3824.78) a very effective measure which will help the customs to monitor and control imports and exports of HFCs and HFC-containing mixtures would be establishment of separate 8 or 10 digits customs codes for the most commonly used HFCs and mixtures in the national customs classification system. The example of customs classification of HFCs and HFC-containing mixtures where specific 8 digits customs codes have been assigned to HFCs and HFC-containing mixtures is CN system mandatory in the EU – see Annex 5 for details.



© Ezra Clark

⁴⁰ <http://www.unep.org/ozonaction/resources/informal-prior-informed-consent-mechanism>

⁴¹ The World Customs Organization (WCO) is planning to introduce individual 6 digits HS codes for some most common HFCs and HFC-containing blends but this change in HS system can only enter into force in 2022.



Criteria to define the 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 sessions may require the purchase of refrigerant identifiers able to detect HFCs and related blends. A significant number of customs and environmental officers should be trained before the introduction of trade restrictions which may coincide with the HFC freeze in 2024 or earlier with a possible ban of new HFC installations or HFC 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 p. 73.



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 HFCs would work well without refresher trainings, they may wish not to prioritize these. If the country's competent authorities are confident that the monitoring and control of HFCs and HFC-containing products/equipment and the enforcement of HFC-related legislation, licensing system, quotas and bans are already covered by current 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. Otherwise, organization of training courses having programmes designed for monitoring and control of HFCs or training courses devoted mainly to HCFCs, but supplemented with information on HFCs should be considered as one of substantial tools which would facilitate smooth and effective HFC phase-down.



Status of implementation in selected countries

Customs training focused specifically on HFCs have not yet (2017) been conducted in Article 5 countries, but some information on HFCs was delivered during train-the-trainers customs workshops focused on monitoring and control of trade in HCFCs, e.g. in Albania, Turkey, Uzbekistan or Moldova. In Turkey, Uzbekistan and Moldova the participants had to pass the test in order to receive the participation certificate. Interesting approach taken in Turkey's customs train-the-trainer workshop was that at that workshop four local customs trainers were selected who one day later delivered similar, but much shortened training to the group of customs officers at the training course organized back-to-back with that workshop. The international Consultant who conducted the main train-the-trainers workshop was also present at that training course acting as a resource person. With that approach it was possible for the local trainers to test their teaching skills and for the International Consultant to evaluate their capability to become good customs trainers.

Since in the European Union trade in HCFCs and products/equipment containing or relying on HCFCs is banned and the F-gas legislation is mandatory to follow, the customs trainings on monitoring and control of HFCs have already been organized and the relevant Customs Training Manuals have been developed in some EU Member States – Poland can be an example of such Member State. The EU has also introduced individual customs codes for the most commonly used HFCs and HFC-containing mixtures and RAC&HP equipment pre-charged with HFCs in its customs classification system – see Annexes 5 and 6 for details.



Links and resources

- Training Manual for Customs and Enforcement Officers (third edition) which contains some information on HFCs is available from UN Environment OzonAction website on <http://www.unep.org/ozonaction/what-we-do/customs-enforcement>
- Customs Quick Tool for Screening ODS which contains some information on HFCs and HFC-containing blends and can also be used as a poster is available from UN Environment OzonAction website <http://www.unep.org/ozonaction/what-we-do/customs-enforcement>

- Access to on-line customs training course on monitoring and control of ODS (e-learning module) flyer and other brochures published by UN Environment related to combating illegal trade in ODS can be obtained through <http://www.unep.org/ozonaction/what-we-do/customs-enforcement>
- CN customs classification of goods mandatory in the EU can be found on <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:294:FULL&from=EN>
- Information on Green Customs Initiative is available on <http://www.greencustoms.org>



6.2

Training and certification of refrigeration technicians



General description

So far training and certification of refrigeration technicians conducted in Article 5 countries has focused on containment of CFCs and HCFCs and retro-fitting with HFCs as their primary replacement. Natural refrigerants (including ammonia, hydrocarbons, carbon dioxide) or low GWP unsaturated HFCs (HFOs) were only presented at a general level since the focus of refrigerant management plans (RMPs), terminal phase-out management plans (TPMPs) and HCFC Phase-out Management Plans was first on CFCs phase-out and later on HCFCs phase-out, so proper management of those two groups of refrigerants was essential.

Once the HFC phase-down schedules for Article 5 countries were introduced in 2016 through the Kigali Amendment, the situation changed and new training and certification programmes need to be designed as part of HFC phase-down related projects in order to train refrigeration technicians on using alternative technologies as well as on HFC containment. Only a few Article 5 countries have started the process of adjusting national legislation according to the new Montreal Protocol provisions related to HFCs and adopting relevant administrative, legal and institutional measures accordingly. Appropriate training of refrigeration technicians will ensure the proper management of HFC alternatives and HFC 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 HFC replacement technologies in the local training system curriculum and in technical school teaching programmes.

Similar to the previous training programmes conducted, the HFC-related training may consist of a train-the-trainers programme and a subsequent train-the-technicians programme. In terms of technology choice to replace HFCs, the energy efficiency and climate benefits of "natural" refrigerants and low-GWP unsaturated HFCs (HFOs) 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 p. 72). 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. Only technicians who have successfully passed the examination should be registered and receive a certificate, so participation in training course may not be a pre-condition for the technician to be certified, though it is recommended that the technicians attend the course before undertaking an examination. Furthermore, it needs to be decided by the competent authorities whether only stationary or both stationary and mobile equipment will be included in the training programmes. Important topic to be covered by such training programmes or teaching curricula in schools should be standards (international or local, if in place in the country) related to the management of alternative refrigerants, specifically highly flammable hydrocarbons and moderately flammable lower GWP HFCs and HFOs.



Advantages / impact / benefits

The availability of trained and certified technicians is a pre-condition for the market introduction of new technologies including installation, servicing, repair, etc. and thus will contribute to the sustainable development of the refrigeration and air-conditioning sector and enhance competitiveness. It will also reduce the demand for HFCs through improving containment and thus reducing leakages.



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 implementation of projects financed through Multilateral Fund or other sources.



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-HFC alternatives and HFC containment will be described. Development of appropriate examination and certification procedures (including selection of local examination and certification bodies) is necessary if not just participation in a training course, but passing the examination will be required to receive certificate (see p. 72). Certification of servicing companies which employ certified technicians and can prove that procedures and tools needed for conducting installation, servicing or maintenance, leakage checking, repair and decommissioning of the equipment are in place is a very useful support measure. Then, it should be specified in the country's legislation that only certified technicians and certified companies can be allowed to conduct those activities with HFCs. 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 HFC-containing equipment. – see also "Awareness raising of stakeholders" option on p. 73.



Criteria to define the 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 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 HFC installations or HFC use bans (see Chapter 3). Since such bans could already be envisaged for the freeze years of 2024/2028, these training programmes should be initiated as early as possible.



Criteria for decision making to implement / not to implement

If the country's competent authorities are confident that the management of non-HFC refrigerants and the containment of HFCs was already included in 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. Otherwise, implementation of training and certification scheme for refrigeration technicians that will focus on management of HFCs and alternative refrigerants is absolutely necessary if the country wishes to follow the HFC phase-down smoothly and effectively.



Status of implementation in selected countries

In the United States, training and certification requirements apply to technicians who deal with HFCs refrigerants. Canada introduced best practices for minimizing emissions of all ozone-depleting substance and HFC refrigerants when operating and servicing equipment. In Australia, specific equipment-oriented certificates are required in order to receive a license to servicing equipment with HCFC or HFC refrigerants. Japan requires that only registered undertakings perform the recovery of CFCs, HCFCs and HFCs from commercial refrigerators and air-conditioners at the time of maintenance and disposal.

In the European Union the EU Regulation on F-gases (Regulation 517/2014) requires not only certification of refrigeration technicians performing specific activities (leakage checking, recovery, installation, servicing or maintenance, repair and decommissioning of stationary RAC&HP equipment and large refrigerated trucks and trailers), but also certification of companies performing installation and servicing or maintenance of that equipment. It is mandatory to pass the relevant examination in order to receive the certificate. The relevant implementing act (Regulation 2067/2015) 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. Furthermore, based on the implementing Commission Regulation 307/2008 completion of a training course is required for technicians who service mobile air conditioning equipment installed in passenger cars.

In the EU also technicians and servicing companies who service the fire protection equipment which contains HFCs and technicians who service equipment containing HFCs as solvents are obliged to hold a certificate.



Links and resources

- Information on training and certification requirements related to technicians dealing with HFCs in different countries can be found in the Ozone Secretariat document UNEP/OzL.Pro.28/11 <http://conf.montreal-protocol.org/meeting/mop/mop-28/presession/English/MOP-28-11E.pdf>
- Information on new refrigerants and their designations can be found in UN Environment OzonAction Factsheets : "Update on New Refrigerants Designations and Safety Classifications", <http://www.unep.fr/ozonaction/information/mmcfiles/7769-e-FactsheetASHRAENewRefrigerants.pdf> and "Commonly Used Non-ODS Substitute Refrigerants", <http://www.unep.fr/ozonaction/information/mmcfiles/7782-e-CommonlyUsedNon-ODSSubstituteRefrigerants.pdf>
- Information on certification schemes for refrigeration and air conditioning technicians can be found in UNEP brochure : "National certification schemes for refrigeration and air conditioning service technicians", <http://www.unep.org/ozonaction/what-we-do/certification>
- Detailed information on the EU legislation laying down the requirements for personal certificates for refrigeration technicians conducting various activities and the relevant examination and training programmes (regulations 2067/2015, 304/2008, 306/2008 and 307/2008) can be found on https://ec.europa.eu/policies/f-gas_en



Awareness raising of stakeholders



General description

Awareness raising of stakeholders should be part of any HFC phase-down 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 HFCs 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 HCFC phase-out programmes, the awareness raising activities related to HFCs phase-down may initially target the same specific stakeholder groups (i.e. importers, exporters, dealers and users of HFCs, servicing companies, equipment owners and producers/importers/exporters of HFCs-containing products or equipment). These groups should be made aware of the HFC phase-down schedule and any upcoming 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. Well-designed awareness raising communication can improve preparedness of stakeholders to appreciate the value of training on alternatives and good practices that can follow.

Consumers/public who purchase products and equipment containing HFCs with high GWP should be educated about avoiding such transactions. This will ensure their well-informed participation in collective efforts and awareness that such environmental issues directly influence quality of their lives. They can be guided to also demand efficient servicing with all preventive measures. Servicing centres can display certificates / commendations about their compliance with the phase down demands to inspire confidence in their consumers.

The following instruments could be considered:

1. Media releases

a) Press releases - in the case of HFCs 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. A much-needed news wire service can assist journalists / bloggers and online communication for rapid and consistent messaging. This is to highlight the immediacy of the HFC phase-down challenge and the opportunity to change over to the alternatives at the earliest. News media institutions can also be supported in a focus manner with precise and substantiated news inputs. These can be carried forward by the news papers.

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 separately for:

a) importers, exporters and dealers

b) servicing companies operating in refrigeration sector

c) HFC end users in each sector, specifically those who exploit (i.e. the operators of) RAC&HP, fire protection and solvent equipment.

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 stake-holder consultations – those could be organized in the form of sponsored events, such as expert panel discussions in the presence of major stakeholders.

4. Making the best use of social media tools through downloadable applications in smart phones. This will ensure pointed and rapid messaging.

In all of those awareness raising activities the important role of HFC phase-down in overall reduction of greenhouse gases emission and consequently in achieving measurable local and global environmental benefits should be emphasized.

How is awareness raising to be organized and managed? If the National Ozone Unit is not in a position to conduct it, the competent authority (usually the Ministry of Environment) may invite the participation of institutions engaged in science / technology communication in the other ministries. Typically, these could be part of the Ministry of Science & Technology or of Industries etc. They are likely to serve the mandate of science popularization from a science and society perspective, that is important for stakeholder engagement in the phase down context. Another option is to 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.



Advantages / impact / benefits

The advantage of launching the awareness raising activities targeting the major stakeholders will ensure they are provided with information at an early stage and would encourage the involvement of stakeholders and increase stakeholder support. This will help reduce the growth curve in HFC consumption and encourage key HFC-using industries to get involved in the HFC phase-down process. Raising awareness of company owners will enable them to take informed investment decisions and contribute to an effective phase-down of HFCs.



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. HFC-related awareness raising activities in developing countries could be financed from the country's Institutional Strengthening projects or from private sector co-financing.



Support measures required for effective implementation

A useful support measure would be creation of a HFC-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 for the example of such a website created by the UK government).



Criteria to define the most suitable implementation schedule

Relevant stakeholders should be informed at an early stage to ensure their involvement and support. Awareness should therefore be seen as a strategically important forerunner to training to improve preparedness of stakeholders. They should be made aware of the country's HFC phase-down schedule resulting from the Kigali Amendment and any upcoming policy and legislative measures in the country. Once the Kigali Amendment has been ratified and legislation on HFCs has been adopted, awareness raising activities should be intensified to reach out the message.



Criteria for decision making to implement / not to implement

If the country has made significant progress in HFC phase-down and already established HFC-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.



Status of implementation in selected countries

In the United States, the main programme on raising awareness on alternatives to HCFCs and HFCs is EPA's Significant New Alternatives Policy (SNAP) and findings of that programme are made available to the general public on the USEPA webpage. USEPA conducts outreach to stakeholders, including government and non-governmental organizations, industry, the military, research and testing institutes and national and international standards-setting organizations, in an effort to gain support for a transition to alternatives. 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 there is a very well designed guidance on the practical aspects of implementation of the EU F-gas regulations designated to reach to all relevant stakeholders in the UK which is available on the website of UK Ministry of Environment (DEFRA) and which may be recommended to be taken as good example of how the awareness raising can be implemented.

In Article 5 countries, awareness raising related to HFCs has not yet been started, though it can be planned in the projects submitted to Multilateral Fund by individual countries. Useful information on alternatives to HCFCs and HFCs can be found on the HCFC Help Centre website created by UN Environment. TEAP reports on technologies alternative to HFCs, publication entitled "Primer on HFCs" (IGSD, August 2015), and an Ozone Secretariat document UNEP/OzL.Pro.28/11 based on the submissions of the Parties on implementation of decision XIX/6 which provides information on measures taken in various countries with regard to HFC phase-down can also be very useful sources of information and can be utilized in any awareness raising campaign.



Links and resources

- Information on the USEPA SNAP programme and GreenChill initiative can be found on <https://www.epa.gov/snap/overview-snap> and <https://www.epa.gov/greenchill> websites, respectively.
- Guidance to the UK stakeholders on HFCs and other F-gases can be found on www.defra.gov.uk/fgas
- "Primer on HFCs" publication can be downloaded from <http://www.igsd.org/wp-content/uploads/2015/10/HFC-Primer-18October2016.pdf>
- Extended information on alternatives to HCFCs and HFCs can be found in TEAP reports available at Ozone Secretariat website and also in B. Zeiger, B. Gschrey, W. Schwarz: "Alternatives to HCFCs/HFCs in developing countries with a focus on high ambient temperatures" which can be downloaded from : https://ec.europa.eu/clima/sites/clima/files/f-gas/legislation/docs/alternatives_high_gwp_en.pdf

CONCLUSIONS

HFC phase-down schedules contained in the Kigali Amendment agreed by the Parties to the Montreal Protocol in 2016 will have to be followed by the Article 5 countries once they ratify the Amendment. Early implementation of a basket of specific legislative and policy measures contained in this booklet will allow for smooth and effective phase down and will facilitate compliance. While each country can decide on the set of options they would prefer to include in their HFC phase-down strategy and then to implement and on the most realistic implementation schedule, the timeline proposed below may help in taking that decision.

It is recommended that each country considers carefully pros and cons of each option and include the provisions related to the selected solutions in the draft HFC legislation. The date the particular option will enter into force should be consulted with the stakeholders before it is established in that legislation and the date of a review of the HFC legislation should be determined in order to take into account experiences in implementation of the new measures in practice.

It is also recommended that a relevant country-specific Road-map is drafted where the actions to be conducted, the proposed schedule of implementation of all selected measures and the responsible institutions would be listed.





Recommended schedule of implementation of policy and legislative options

Kigali Amendment (KA) HFC consumption and production phase-down regime

HFC consumption and production phase-down schedule and other important dates	Recommended action to be undertaken by A5 country
15 Oct 2016 KA is agreed upon	2016/2017 all A5 → awareness raising of all stakeholder groups (e.g. importers, exporters, end users) of the need of HFC phase-down
	2017 all A5 → start of drafting the HFC legislation that will include all measures deemed necessary to follow HFC phase-down schedules
	2018 all A5 → completion of HFC inventories, establishment of mandatory reporting and emission control measures and ratification of KA
1 Jan 2019 KA enters into force ⁴²	1 Jan 2019 all A5 → establishment of HFC import/export licensing system è mandatory based on KA ⁴³
	2020 all A5 → establishment of mandatory labeling of HFC containers (and equipment)
2022 technology review	2021 all A5 → completion of customs training and establishment of refrigeration technicians certification system for HFC management
	2022 A5 Group 1 → establishment of restrictions on placing on the market of products and equipment containing or relying on HFCs
	2023 A5 Group 1 → establishment of country's baseline and setting up country's annual HFC consumption quota
1 Jan 2024 freeze date for A5 Group 1	2024 A5 Group 1 → establishment of ban on new HFC installations and setting up HFC logbooks and HFC equipment logbooks
2025 technology review - compliance deferral of 2 years for A5 Group 2 (?)	
	2026 A5 Group 2 → establishment of restrictions on placing on the market of products and equipment containing or relying on HFCs
2027 technology review	2027 A5 Group 2 → establishment of country's baseline and setting up HFC consumption quotas; HAT countries è identification of exemptions
1 Jan 2028 freeze date for A5 Group 2 (possible compliance deferral of two years)	2028 A5 Group 2 → establishment of ban on new HFC installations and of HFC logbooks and HFC equipment logbooks
1 Jan 2029 10% reduction for A5 Group 1	2029 A5 Group 1 → establishment of permits for each HFC shipment, proof of origin for HFC shipments and permits for HFC transit
2029 possible agreement on exemptions	2030 all A5 countries → establishment of non-HAT exemptions – if agreed upon in 2029
1 Jan 2032 10% reduction for A5 Group 2	2032 A5 Group 2 → establishment of permits for each HFC shipment, proof of origin for HFC shipments and permits for HFC transit
2032 technology review	1 Jan 2033 all A5 → establishment of ban on trade with non-Parties to the Kigali Amendment → resulting from the Kigali Amendment
	2034 A5 Group 1 → establishment of ban on non-refillable HFC containers, HFC use bans and fees for HFC imports/placing on the market
1 Jan 2035 30% reduction for A5 Group I	
	2036 A5 Group 2 → establishment of ban on non-refillable HFC containers, HFC use bans and fees for HFC imports/placing on the market
1 Jan 2037 20% reduction for A5 Group II	
2037 technology review	
1 Jan 2040 50% reduction for A5 Group I	2040 all A5 → establishment of electronically operated licensing system for HFCs
1 Jan 2042 30% reduction for A5 Group II	
2042 technology review	
1 Jan 2045 80% reduction for A5 Group I	
1 Jan 2047 85% reduction for A5 Group II	
2047 technology review	

42 Provided that it is ratified by at least 20 Parties to the Montreal Protocol (or 90 days after ratification by the 20th Party).

43 Any Party operating under paragraph 1 of Article 5 that decides it is not in a position to establish and implement such a system by 1 January 2019 may delay taking those actions until 1 January 2021.





ANNEXES

Annex 1.

The text of the Kigali Amendment to the Montreal Protocol as agreed upon by the Parties in Kigali (Rwanda) in October 2016. Annex F contains the list of HFCs to be phased down 80

Annex 2.

Phase-down schedules set up in the Kigali Amendment for Article 5 and non-Article 5 countries 87

Annex 3.

Decision XXVIII/2 of the Parties setting up, *inter alia*, the conditions for granting HAT exemption and the list of Article 5 countries eligible for that exemption 88

Annex 4.

Recommended format for HFC equipment logbook 94

Annex 5.

Customs codes for HFCs, PFCs, HFOs and HFC/PFC/HFO-containing blends introduced in the European Union customs classification system (CN) within HS sub-heading 2903 39 95

Annex 6.

Customs classification of RAC&HP equipment containing or relying on HFCs 96

ANNEX 1

Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer

Article I: Amendment

Article 1, paragraph 4

In paragraph 4 of Article 1 of the Protocol, for the words: "Annex C or Annex E" there shall be substituted: "Annex C, Annex E or Annex F"

Article 2, paragraph 5

In paragraph 5 of Article 2 of the Protocol, for the words: "and Article 2H" there shall be substituted: "Articles 2H and 2J"

Article 2, paragraphs 8 (a), 9 (a) and 11

In paragraphs 8 (a) and 11 of Article 2 of the Protocol, for the words: "Articles 2A to 2I" there shall be substituted: "Articles 2A to 2J"

The following words shall be added at the end of subparagraph (a) of paragraph 8 of Article 2 of the Protocol: "Any such agreement may be extended to include obligations respecting consumption or production under Article 2J provided that the total combined calculated level of consumption or production of the Parties concerned does not exceed the levels required by Article 2J."

In subparagraph (a) (i) of paragraph 9 of Article 2 of the Protocol, after the second use of the words: "should be;" there shall be deleted: "and" Subparagraph (a) (ii) of paragraph 9 of Article 2 of the Protocol shall be renumbered as subparagraph (a) (iii).

The following shall be added as subparagraph (a) (ii) after subparagraph (a) (i) of paragraph 9 of Article 2 of the Protocol: "Adjustments to the global warming potentials specified in Group I of Annex A, Annex C and Annex F should be made and, if so, what the adjustments should be; and"

Article 2J

The following Article shall be inserted after Article 2I of the Protocol:

"Article 2J: Hydrofluorocarbons

1. Each Party shall ensure that for the twelve-month period commencing on 1 January 2019, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Annex F, expressed in CO₂ equivalents, does not exceed the percentage, set out for the respective range of years specified in subparagraphs (a) to (e) below, of the annual average of its calculated levels of consumption of Annex F controlled substances for the years 2011, 2012 and 2013, plus fifteen per cent of its calculated level of consumption of Annex C, Group I, controlled substances as set out in paragraph 1 of Article 2F, expressed in CO₂ equivalents:
 - (a) 2019 to 2023: 90 per cent
 - (b) 2024 to 2028: 60 per cent
 - (c) 2029 to 2033: 30 per cent
 - (d) 2034 to 2035: 20 per cent
 - (e) 2036 and thereafter: 15 per cent
2. Notwithstanding paragraph 1 of this Article, the Parties may decide that a Party shall ensure that, for the twelve-month period commencing on 1 January 2020, and in each twelve-month period thereafter, its calculated level of consumption of the controlled substances in Annex F, expressed in CO₂ equivalents, does not exceed the percentage, set out for the respective range of years specified in subparagraphs (a) to (e) below, of the annual average of its calculated levels of consumption of Annex F controlled substances for the years 2011, 2012 and 2013, plus twenty-five per cent of its calculated level of consumption of Annex C, Group I, controlled substances as set out in paragraph 1 of Article 2F, expressed in CO₂ equivalents:

- (a) 2020 to 2024: 95 per cent
- (b) 2025 to 2028: 65 per cent
- (c) 2029 to 2033: 30 per cent
- (d) 2034 to 2035: 20 per cent
- (e) 2036 and thereafter: 15 per cent

3. Each Party producing the controlled substances in Annex F shall ensure that for the twelve-month period commencing on 1 January 2019, and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Annex F, expressed in CO₂ equivalents, does not exceed the percentage, set out for the respective range of years specified in subparagraphs (a) to (e) below, of the annual average of its calculated levels of production of Annex F controlled substances for the years 2011, 2012 and 2013, plus fifteen per cent of its calculated level of production of Annex C, Group I, controlled substances as set out in paragraph 2 of Article 2F, expressed in CO₂ equivalents:

- (a) 2019 to 2023: 90 per cent
- (b) 2024 to 2028: 60 per cent
- (c) 2029 to 2033: 30 per cent
- (d) 2034 to 2035: 20 per cent
- (e) 2036 and thereafter: 15 per cent

4. Notwithstanding paragraph 3 of this Article, the Parties may decide that a Party producing the controlled substances in Annex F shall ensure that for the twelve-month period commencing on 1 January 2020, and in each twelve-month period thereafter, its calculated level of production of the controlled substances in Annex F, expressed in CO₂ equivalents, does not exceed the percentage, set out for the respective range of years specified in subparagraphs (a) to (e) below, of the annual average of its calculated levels of production of Annex F controlled substances for the years 2011, 2012 and 2013, plus twenty-five per cent of its calculated level of production of Annex C, Group I, controlled substances as set out in paragraph 2 of Article 2F, expressed in CO₂ equivalents:

- (a) 2020 to 2024: 95 per cent
- (b) 2025 to 2028: 65 per cent
- (c) 2029 to 2033: 30 per cent
- (d) 2034 to 2035: 20 per cent
- (e) 2036 and thereafter: 15 per cent

Paragraphs 1 to 4 of this Article will apply save to the extent that the Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by the Parties to be exempted uses.

Each Party manufacturing Annex C, Group I, or Annex F substances shall ensure that for the twelve-month period commencing on 1 January 2020, and in each twelve-month period thereafter, its emissions of Annex F, Group II, substances generated in each production facility that manufactures Annex C, Group I, or Annex F substances are destroyed to the extent practicable using technology approved by the Parties in the same twelve-month period.

Each Party shall ensure that any destruction of Annex F, Group II, substances generated by facilities that produce Annex C, Group I, or Annex F substances shall occur only by technologies approved by the Parties.

Article 3

The preamble to Article 3 of the Protocol should be replaced with the following:

"1. For the purposes of Articles 2, 2A to 2J and 5, each Party shall, for each group of substances in Annex A, Annex B, Annex C, Annex E or Annex F, determine its calculated levels of:"

For the final semi-colon of subparagraph (a) (i) of Article 3 of the Protocol there shall be substituted:", except as otherwise specified in paragraph 2;"The following text shall be added to the end of Article 3 of the Protocol:"; and

(d) Emissions of Annex F, Group II, substances generated in each facility that generates Annex C, Group I, or Annex F substances by including, among other things, amounts emitted from equipment leaks, process vents and destruction devices, but excluding amounts captured for use, destruction or storage.

2. When calculating levels, expressed in CO₂ equivalents, of production, consumption, imports, exports and emissions of Annex F and Annex C, Group I, substances for the purposes of Article 2J, paragraph

5 *bis* of Article 2 and paragraph 1 (d) of Article 3, each Party shall use the global warming potentials of those substances specified in Group I of Annex A, Annex C and Annex F.”

Article 4, paragraph 1 sept

The following paragraph shall be inserted after paragraph 1 *sex* of Article 4 of the Protocol: “1 *sept*. Upon entry into force of this paragraph, each Party shall ban the import of the controlled substances in Annex F from any State not Party to this Protocol.”

Article 4, paragraph 2 sept

The following paragraph shall be inserted after paragraph 2 *sex* of Article 4 of the Protocol: “2 *sept*. Upon entry into force of this paragraph, each Party shall ban the export of the controlled substances in Annex F to any State not Party to this Protocol.”

Article 4, paragraphs 5, 6 and 7

In paragraphs 5, 6 and 7 of Article 4 of the Protocol, for the words: “Annexes A, B, C and E” there shall be substituted: “Annexes A, B, C, E and F”

Article 4, paragraphs 8

In paragraph 8 of Article 4 of the Protocol, for the words: “Articles 2A to 2I” there shall be substituted: “Articles 2A to 2J”

Article 4B

The following paragraph shall be inserted after paragraph 2 of Article 4B of the Protocol:

“2 *bis*. Each Party shall, by 1 January 2019 or within three months of the date of entry into force of this paragraph for it, whichever is later, establish and implement a system for licensing the import and export of new, used, recycled and reclaimed controlled substances in Annex F. Any Party operating under paragraph 1 of Article 5 that decides it is not in a position to establish and implement such a system by 1 January 2019 may delay taking those actions until 1 January 2021.”

Article 5

In paragraph 4 of Article 5 of the Protocol, for the word: “2I” there shall be substituted: “2J”

In paragraphs 5 and 6 of Article 5 of the Protocol, for the words: “Article 2I” there shall be substituted: “Articles 2I and 2J”

In paragraph 5 of Article 5 of the Protocol, before the words: “any control measures” there shall be inserted: “with”

The following paragraph shall be inserted after paragraph 8 *ter* of Article 5 of the Protocol: “8 *qua*

(a) Each Party operating under paragraph 1 of this Article, subject to any adjustments made to the control measures in Article 2J in accordance with paragraph 9 of Article 2, shall be entitled to delay its compliance with the control measures set out in subparagraphs (a) to (e) of paragraph 1 of Article 2J and subparagraphs (a) to (e) of paragraph 3 of Article 2J and modify those measures as follows:

(b) Notwithstanding subparagraph (a) above, the Parties may decide that a Party operating under paragraph 1 of this Article, subject to any adjustments made to the control measures in Article 2J in accordance with paragraph 9 of Article 2, shall be entitled to delay its compliance with the control measures set out in subparagraphs (a) to (e) of paragraph 1 of Article 2J and subparagraphs (a) to (e) of paragraph 3 of Article 2J and modify those measures as follows:

- (i) 2028 to 2031: 100 per cent
- (ii) 2032 to 2036: 90 per cent
 - (i) 2024 to 2028: 100 per cent
 - (ii) 2029 to 2034: 90 per cent
 - (iii) 2035 to 2039: 70 per cent
 - (iv) 2040 to 2044: 50 per cent
 - (v) 2045 and thereafter: 20 per cent

- (iii) 2037 to 2041: 80 per cent
- (iv) 2042 to 2046: 70 per cent
- (v) 2047 and thereafter: 15 per cent

(c) Each Party operating under paragraph 1 of this Article, for the purposes of calculating its consumption baseline under Article 2J, shall be entitled to use the average of its calculated levels of consumption of Annex F controlled substances for the years 2020, 2021 and 2022, plus sixty-five per cent of its baseline consumption of Annex C, Group I, controlled substances as set out in paragraph 8 *ter* of this Article.

(d) Notwithstanding subparagraph (c) above, the Parties may decide that a Party operating under paragraph 1 of this Article, for the purposes of calculating its consumption baseline under Article 2J, shall be entitled to use the average of its calculated levels of consumption of Annex F controlled substances for the years 2024, 2025 and 2026, plus sixty-five per cent of its baseline consumption of Annex C, Group I, controlled substances as set out in paragraph 8 *ter* of this Article.

(e) Each Party operating under paragraph 1 of this Article and producing the controlled substances in Annex F, for the purposes of calculating its production baseline under Article 2J, shall be entitled to use the average of its calculated levels of production of Annex F controlled substances for the years 2020, 2021 and 2022, plus sixty-five per cent of its baseline production of Annex C, Group I, controlled substances as set out in paragraph 8 *ter* of this Article.

(f) Notwithstanding subparagraph (e) above, the Parties may decide that a Party operating under paragraph 1 of this Article and producing the controlled substances in Annex F, for the purposes of calculating its production baseline under Article 2J, shall be entitled to use the average of its calculated levels of production of Annex F controlled substances for the years 2024, 2025 and 2026, plus sixty-five per cent of its baseline production of Annex C, Group I, controlled substances as set out in paragraph 8 *ter* of this Article.

(g) Subparagraphs (a) to (f) of this paragraph will apply to calculated levels of production and consumption save to the extent that a high-ambient-temperature exemption applies based on criteria decided by the Parties."

Article 6

In Article 6 of the Protocol, for the words: "Articles 2A to 2I" there shall be substituted: "Articles 2A to 2J"

Article 7, paragraphs 2, 3 and 3 *ter*

The following line shall be inserted after the line that reads "– in Annex E, for the year 1991," in paragraph 2 of Article 7 of the Protocol:

"– in Annex F, for the years 2011 to 2013, except that Parties operating under paragraph 1 of Article 5 shall provide such data for the years 2020 to 2022, but those Parties operating under paragraph 1 of Article 5 to which subparagraphs (d) and (f) of paragraph 8 *qua* of Article 5 applies shall provide such data for the years 2024 to 2026;"

In paragraphs 2 and 3 of Article 7 of the Protocol, for the words: "C and E" there shall be substituted: "C, E and F"

The following paragraph shall be added to Article 7 of the Protocol after paragraph 3 *bis*:

"3 *ter*. Each Party shall provide to the Secretariat statistical data on its annual emissions of Annex F, Group II, controlled substances per facility in accordance with paragraph 1 (d) of Article 3 of the Protocol."

Article 7, paragraph 4

In paragraph 4 of Article 7, after the words: "statistical data on" and "provides data on" there shall be added: "production,"

Article 10, paragraph 1

In paragraph 1 of Article 10 of the Protocol, for the words: "and Article 2I" There shall be substituted: ", Article 2I and Article 2J"

The following shall be inserted at the end of paragraph 1 of Article 10 of the Protocol:

“Where a Party operating under paragraph 1 of Article 5 chooses to avail itself of funding from any other financial mechanism that could result in meeting any part of its agreed incremental costs, that part shall not be met by the financial mechanism under Article 10 of this Protocol.”

Article 17

In Article 17 of the Protocol, for the words: “Articles 2A to 2I” there shall be substituted: “Articles 2A to 2J”

Annex A

The following table shall replace the table for Group I in Annex A to the Protocol:

Group	Substance	Ozone-Depleting Potential*	100-Year Global Warming Potential	
Group I				
	CFCI ₃	(CFC-11)	1.0	4,750
	CF ₂ Cl ₂	(CFC-12)	1.0	10,900
	C ₂ F ₃ Cl ₃	(CFC-113)	0.8	6,130
	C ₂ F ₄ Cl ₂	(CFC-114)	1.0	10,000
	C ₂ F ₅ Cl	(CFC-115)	0.6	7,370

Annex C and Annex F

The following table shall replace the table for Group I in Annex C to the Protocol:

Group	Substance	Number of isomers	Ozone-Depleting Potential*	100-Year Global Warming Potential***	
Group I					
	CHFCl ₂	(HCFC-21)**	1	0.04	151
	CHF ₂ Cl	(HCFC-22)**	1	0.055	1810
	CH ₂ FCl	(HCFC-31)	1	0.02	
	C ₂ HFCI ₄	(HCFC-121)	2	0.01–0.04	
	C ₂ HF ₂ Cl ₃	(HCFC-122)	3	0.02–0.08	
	C ₂ HF ₃ Cl ₂	(HCFC-123)	3	0.02–0.06	77
	CHCl ₂ CF ₃	(HCFC-123)**	–	0.02	
	C ₂ HF ₄ Cl	(HCFC-124)	2	0.02–0.04	609
	CHFClCF ₃	(HCFC-124)**	–	0.022	
	C ₂ H ₂ FCl ₃	(HCFC-131)	3	0.007–0.05	
	C ₂ H ₂ F ₂ Cl ₂	(HCFC-132)	4	0.008–0.05	
	C ₂ H ₂ F ₃ Cl	(HCFC-133)	3	0.02–0.06	
	C ₂ H ₃ FCl ₂	(HCFC-141)	3	0.005–0.07	
	CH ₃ CFCl ₂	(HCFC-141b)**	–	0.11	725
	C ₂ H ₃ F ₂ Cl	(HCFC-142)	3	0.008–0.07	
	CH ₃ CF ₂ Cl	(HCFC-142b)**	–	0.065	2310
	C ₂ H ₄ FCl	(HCFC-151)	2	0.003–0.005	
	C ₃ HFCI ₆	(HCFC-221)	5	0.015–0.07	
	C ₃ HF ₂ Cl ₅	(HCFC-222)	9	0.01–0.09	
	C ₃ HF ₃ Cl ₄	(HCFC-223)	12	0.01–0.08	
	C ₃ HF ₄ Cl ₃	(HCFC-224)	12	0.01–0.09	
	C ₃ HF ₅ Cl ₂	(HCFC-225)	9	0.02–0.07	
	CF ₃ CF ₂ CHCl ₂	(HCFC-225ca)**	–	0.025	122
	CF ₂ ClCF ₂ CHClF	(HCFC-225cb)**	–	0.033	595
	C ₃ HF ₆ Cl	(HCFC-226)	5	0.02–0.10	

Group	Substance	Number of isomers	Ozone-Depleting Potential*	100-Year Global Warming Potential***
	C ₃ H ₂ Cl ₅	(HCFC-231)	9	0.05–0.09
	C ₃ H ₂ F ₂ Cl ₄	(HCFC-232)	16	0.008–0.10
	C ₃ H ₂ F ₃ Cl ₃	(HCFC-233)	18	0.007–0.23
	C ₃ H ₂ F ₄ Cl ₂	(HCFC-234)	16	0.01–0.28
	C ₃ H ₂ F ₅ Cl	(HCFC-235)	9	0.03–0.52
	C ₃ H ₃ Cl ₄	(HCFC-241)	12	0.004–0.09
	C ₃ H ₃ F ₂ Cl ₃	(HCFC-242)	18	0.005–0.13
	C ₃ H ₃ F ₃ Cl ₂	(HCFC-243)	18	0.007–0.12
	C ₃ H ₃ F ₄ Cl	(HCFC-244)	12	0.009–0.14
	C ₃ H ₄ Cl ₃	(HCFC-251)	12	0.001–0.01
	C ₃ H ₄ F ₂ Cl ₂	(HCFC-252)	16	0.005–0.04
	C ₃ H ₄ F ₃ Cl	(HCFC-253)	12	0.003–0.03
	C ₃ H ₅ Cl ₂	(HCFC-261)	9	0.002–0.02
	C ₃ H ₅ F ₂ Cl	(HCFC-262)	9	0.002–0.02
	C ₃ H ₆ Cl	(HCFC-271)	5	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.

*** For substances for which no GWP is indicated, the default value 0 applies until a GWP value is included by means of the procedure foreseen in paragraph 9 (a) (ii) of Article 2.

The following annex shall be added to the Protocol after Annex E:

“Annex F Controlled substances

Group	Substance	100-Year Global Warming Potential	
Group I			
	CHF ₂ CHF ₂	HFC-134	1,100
	CH ₂ FCF ₃	HFC-134a	1,430
	CH ₂ FCHF ₂	HFC-143	353
	CHF ₂ CH ₂ CF ₃	HFC-245fa	1,030
	CF ₃ CH ₂ CF ₂ CH ₃	HFC-365mfc	794
	CF ₃ CHF ₂ CF ₃	HFC-227ea	3,220
	CH ₂ FCF ₂ CF ₃	HFC-236cb	1,340
	CHF ₂ CHF ₂ CF ₃	HFC-236ea	1,370
	CF ₃ CH ₂ CF ₃	HFC-236fa	9,810
	CH ₂ FCF ₂ CHF ₂	HFC-245ca	693
	CF ₃ CHFCH ₂ CF ₂ CF ₃	HFC-43-10mee	1,640
	CH ₂ F ₂	HFC-32	675
	CHF ₂ CF ₃	HFC-125	3,500
	CH ₃ CF ₃	HFC-143a	4,470
	CH ₃ F	HFC-41	92
	CH ₂ FCH ₂ F	HFC-152	53
	CH ₃ CHF ₂	HFC-152a	124
Group II			
	CHF ₃	HFC-23	14,800

Article II: Relationship to the 1999 Amendment

No State or regional economic integration organization may deposit an instrument of ratification, acceptance or approval of or accession to this Amendment unless it has previously, or simultaneously, deposited such an instrument to the Amendment adopted at the Eleventh Meeting of the Parties in Beijing, 3 December 1999.

Article III: Relationship to the United Nations Framework Convention on Climate Change and its Kyoto Protocol

This Amendment is not intended to have the effect of excepting hydrofluorocarbons from the scope of the commitments contained in Articles 4 and 12 of the United Nations Framework Convention on Climate Change or in Articles 2, 5, 7 and 10 of its Kyoto Protocol.

Article IV: Entry into force

Except as noted in paragraph 2, below, this Amendment shall enter into force on 1 January 2019, provided that at least twenty instruments of ratification, acceptance or approval of the Amendment have been deposited by States or regional economic integration organizations that are Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer. In the event that this condition has not been fulfilled by that date, the Amendment shall enter into force on the ninetieth day following the date on which it has been fulfilled.

The changes to Article 4 of the Protocol, Control of trade with non-Parties, set out in Article I of this Amendment shall enter into force on 1 January 2033, provided that at least seventy instruments of ratification, acceptance or approval of the Amendment have been deposited by States or regional economic integration organizations that are Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer. In the event that this condition has not been fulfilled by that date, the Amendment shall enter into force on the ninetieth day following the date on which it has been fulfilled.

For purposes of paragraphs 1 and 2, any such instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by member States of such organization.

After the entry into force of this Amendment, as provided under paragraphs 1 and 2, it shall enter into force for any other Party to the Protocol on the ninetieth day following the date of deposit of its instrument of ratification, acceptance or approval.

Article V: Provisional application

Any Party may, at any time before this Amendment enters into force for it, declare that it will apply provisionally any of the control measures set out in Article 2J, and the corresponding reporting obligations in Article 7, pending such entry into force.

I hereby certify that the foregoing text is a true copy of the Amendment adopted on 15 October 2016 at the Twenty-Eighth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, which was held in Kigali, Rwanda, from 10 to 15 October 2016.

For the Secretary-General, The Under-Secretary-General for Legal Affairs and United Nations Legal Counsel

Je certifie que le texte qui precede est une copie conforme de l'Amendement adopte le 15 octobre 2016 a la vingt-huitieme Reunion des Parties au Protocole de Montreal relatif a des substances qui appauvrissent la couche d'ozone, tenue a Kigali, Rwanda, du 10 au 15 octobre 2016.

Pour le Secretaire general, Le Secretaire general adjoint aux affaires juridiques et Conseiller juridique des Nations Unies

Miguel de Serpa Soares

United Nations Organisation des Nations Unies New York, 18 November 2016 New York,
le 18 novembre 2016

ANNEX 2

Phase-down schedules set up in Kigali Amendment for A5 and A2 (non-A5) countries

	A5 Group 1	A5 Group 2	A2
Baseline	2020-2022	2024-2026	2011-2013
Formula	Average HFC consumption	Average HFC consumption	Average HFC consumption
HCFC	65% baseline	65% baseline	15% baseline*
Freeze	2024	2028	-
1 st step	2029 – 10%	2032 – 10%	2019 – 10%
2 nd step	2035 – 30%	2037 – 20%	2024 – 40%
3 rd step	2040 – 50%	2042 – 30%	2029 – 70%
4 th step			2034 – 80%
Plateau	2045 – 80%	2047 – 85%	2036 – 85%

* For Belarus, Russian Federation, Kazakhstan, Tajikistan, Uzbekistan 25% HCFC component of baseline and different initial two steps (1) 5% reduction in 2020 and (2) 35% reduction in 2025

Notes:

Group 1: Article 5 parties not part of Group 2

Group 2: GCC, India, Iran, Iraq, Pakistan

Technology review in 2022 and every 5 years

Technology review 4-5 years before 2028 to consider the compliance deferral of 2 years from the freeze of 2028 of Article 5 Group 2 to address growth in relevant sectors above certain threshold.

ANNEX 3

Decision XXVIII/2 of the Parties setting up, *inter alia*, the conditions for granting HAT exemption and the list of A5 countries eligible for that exemption

Decision XXVIII/2: Decision related to the amendment phasing down hydrofluorocarbons

Recalling decision XXVIII/1, by which the Meeting of the Parties adopted the amendment to the Montreal Protocol set out in annex I to the report of the Twenty-Eighth Meeting of the Parties (hereinafter referred to as the Amendment),

1. That paragraphs 2 and 4 of Article 2J in Article I of the Amendment are applicable to Belarus, Kazakhstan, the Russian Federation, Tajikistan and Uzbekistan;
2. That subparagraphs (b), (d) and (f) of paragraph 8 qua of Article 5 in Article I of the Amendment are applicable to Bahrain, India, the Islamic Republic of Iran, Iraq, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia and the United Arab Emirates (hereinafter referred to as Article 5, group 2, parties);

Elements in paragraph 1 (a) of decision XXVI/9, including intellectual property rights issues in considering the feasibility and ways of managing hydrofluorocarbons

3. To recognize the importance of timely updating international standards for flammable low-global-warming potential (GWP) refrigerants, including IEC60335-2-40, and to support promoting actions that allow safe market introduction, as well as manufacturing, operation, maintenance and handling, of zero-GWP or low-GWP refrigerant alternatives to hydrochlorofluorocarbons and hydrofluorocarbons;
4. To request the Technology and Economic Assessment Panel to conduct periodic reviews of alternatives, using the criteria set out in paragraph 1 (a) of decision XXVI/9, in 2022 and every five years thereafter, and to provide technological and economic assessments of the latest available and emerging alternatives to hydrofluorocarbons;
5. To request the Technology and Economic Assessment Panel to conduct a technology review four or five years before 2028 to consider a compliance deferral of two years from the freeze date of 2028 for Article 5, group 2, parties to address growth above a certain threshold in relevant sectors;

Relationship with the HCFC phase-out

6. To acknowledge the linkage between the hydrofluorocarbon and hydrochlorofluorocarbon reduction schedules relevant to sectors and the preference to avoid transitions from hydrochlorofluorocarbons to high-GWP hydrofluorocarbons and to provide flexibility if no other technically proven and economically viable alternatives are available;
7. To also acknowledge these linkages with respect to certain sectors, in particular industrial process refrigeration, and the preference to avoid transitions from hydrochlorofluorocarbons to high-GWP hydrofluorocarbons and to be willing to provide flexibility, if no other alternatives are available, in cases where:
 - (a) hydrochlorofluorocarbon supply may be unavailable from existing allowable consumption, stocks as well as recovered/recycled material, and
 - (b) it would allow for a direct transition at a later date from hydrochlorofluorocarbons to low-GWP or zero-GWP alternatives;
8. To provide, prior to the commencement of the Article 5 hydrofluorocarbon freeze and in the light of the acknowledgement in paragraph 7 above, flexibility measures in relation to the hydrochlorofluorocarbon phase-out relevant to certain sectors, in particular the industrial process refrigeration subsector, in order to avoid double conversions;

Financial issues**Overarching principles and timelines**

9. To recognize that the Amendment maintains the Multilateral Fund for the Implementation of the Montreal Protocol as the financial mechanism and that sufficient additional financial resources will be provided by parties not operating under paragraph 1 of Article 5 to offset costs arising out of hydrofluorocarbon obligations for parties operating under paragraph 1 of Article 5 under the Amendment;
10. To request the Executive Committee to develop, within two years of the adoption of the Amendment, guidelines for financing the phase-down of hydrofluorocarbon consumption and production, including cost-effectiveness thresholds, and to present those guidelines to the Meeting of the Parties for the parties' views and inputs before their finalization by the Executive Committee;
11. To request the Chair of the Executive Committee to report back to the Meeting of the Parties on the progress made in accordance with this decision, including on cases where Executive Committee deliberations have resulted in a change in a national strategy or a national technology choice submitted to the Executive Committee;
12. To request the Executive Committee to revise the rules of procedure of the Executive Committee with a view to building in more flexibility for parties operating under paragraph 1 of Article 5;

Flexibility in implementation that enables parties to select their own strategies and priorities in sectors and technologies

13. That parties operating under paragraph 1 of Article 5 will have flexibility to prioritize hydrofluorocarbons, define sectors, select technologies and alternatives and elaborate and implement their strategies to meet agreed hydrofluorocarbon obligations, based on their specific needs and national circumstances, following a country-driven approach;
14. To request the Executive Committee of the Multilateral Fund to incorporate the principle referred to in paragraph 13 above into relevant funding guidelines for the phase-down of hydrofluorocarbons and in its decision-making process;

Guidance to the Executive Committee of the Multilateral Fund with respect to the consumption, production and servicing sectors

15. To request the Executive Committee, in developing new guidelines on methodologies and cost calculations, to make the following categories of costs eligible and to include them in the cost calculation:
 - (a) For the consumption manufacturing sector:
 - (i) Incremental capital costs;
 - (ii) Incremental operating costs for a duration to be determined by the Executive Committee;
 - (iii) Technical assistance activities;
 - (iv) Research and development, when required to adapt and optimize low-GWP or zero-GWP alternatives to hydrofluorocarbons;
 - (v) Costs of patents and designs, and incremental costs of royalties, when necessary and cost-effective;
 - (vi) Costs of the safe introduction of flammable and toxic alternatives;
 - (b) For the production sector:
 - (i) Lost profit due to the shutdown/closure of production facilities as well as production reduction;
 - (ii) Compensation to displaced workers;
 - (iii) Dismantling of production facilities;
 - (iv) Technical assistance activities;
 - (v) Research and development related to the production of low-GWP or zero-GWP alternatives to hydrofluorocarbons with a view to lowering the costs of alternatives;
 - (vi) Costs of patents and designs or incremental costs of royalties;
 - (vii) Costs of converting facilities to produce low-GWP or zero-GWP alternatives to hydrofluorocarbons when technically feasible and cost-effective;

- (viii) Costs of reducing emissions of HFC-23, a by-product from the production process of HCFC-22, by reducing its emission rate in the process, destroying it from the off-gas, or by collecting and converting it to other environmentally safe chemicals. Such costs should be funded by the Multilateral Fund to meet the obligations of Parties operating under paragraph 1 of Article 5 specified under the Amendment;
- (c) For the servicing sector:
 - (i) Public-awareness activities;
 - (ii) Policy development and implementation;
 - (iii) Certification programmes and training of technicians on safe handling, good practice and safety in respect of alternatives, including training equipment;
 - (iv) Training of customs officers;
 - (v) Prevention of illegal trade of hydrofluorocarbons;
 - (vi) Servicing tools;
 - (vii) Refrigerant testing equipment for the refrigeration and air-conditioning sector;
 - (viii) Recycling and recovery of hydrofluorocarbons;
16. To request the Executive Committee to increase in relation to the servicing sector the funding available under Executive Committee Decision 74/50 above the amounts listed in that decision for parties with total hydrochlorofluorocarbon baseline consumption up to 360 metric tonnes when needed for the introduction of alternatives to hydrochlorofluorocarbons with low-GWP and zero-GWP alternatives to hydrofluorocarbons and maintaining energy efficiency also in the servicing/end-user sector;

Cut-off date for eligible capacity

17. That the cut-off date for eligible capacity is 1 January 2020 for those parties with baseline years from 2020 to 2022 and 1 January 2024 for those parties with baseline years from 2024 to 2026;

Second and third conversions

18. To request the Executive Committee to incorporate the following principles relating to second and third conversions into funding guidelines:
- (a) First conversions, in the context of a phase-down of hydrofluorocarbons, are defined as conversions to low-GWP or zero-GWP alternatives of enterprises that have never received any direct or indirect support, in part or in full, from the Multilateral Fund, including enterprises that converted to hydrofluorocarbons with their own resources;
 - (b) Enterprises that have already converted to hydrofluorocarbons in phasing out chlorofluorocarbons and/or hydrochlorofluorocarbons will be eligible to receive funding from the Multilateral Fund to meet agreed incremental costs in the same manner as enterprises eligible for first conversions;
 - (c) Enterprises that convert from hydrochlorofluorocarbons to high-GWP hydrofluorocarbons, after the date of adoption of the Amendment, under hydrochlorofluorocarbon phase-out management plans already approved by the Executive Committee will be eligible to receive funding from the Multilateral Fund for a subsequent conversion to low-GWP or zero-GWP alternatives to meet agreed incremental costs in the same manner as enterprises eligible for first conversions;
 - (d) Enterprises that convert from hydrochlorofluorocarbons to high-GWP hydrofluorocarbons with their own resources before 2025 under the Amendment will be eligible to receive funding from the Multilateral Fund to meet agreed incremental costs in the same manner as enterprises eligible for first conversions;
 - (e) Enterprises that convert from hydrofluorocarbons to lower-GWP hydrofluorocarbons with Multilateral Fund support when no other alternatives are available will be eligible to receive funding from the Multilateral Fund for a subsequent conversion to low-GWP or zero-GWP alternatives if necessary to meet the final hydrofluorocarbon phase-down step;



Sustained aggregate reductions

19. To request the Executive Committee to incorporate the following principle related to sustained aggregate reductions into Multilateral Fund policies: remaining eligible consumption for funding in tonnage will be determined on the basis of the starting point of national aggregate consumption less the amount funded by previously approved projects in future multi-year agreement templates for hydrofluorocarbon phase-down plans, consistent with Executive Committee decision 35/57;

Enabling activities

20. To request the Executive Committee to include the following enabling activities to be funded in relation to the hydrofluorocarbon phase-down under the Amendment:
 - (a) Capacity-building and training for the handling of hydrofluorocarbon alternatives in the servicing, manufacturing and production sectors;
 - (b) Institutional strengthening;
 - (c) Article 4B licensing;
 - (d) Reporting;
 - (e) Demonstration projects; and
 - (f) Development of national strategies;

Institutional strengthening

21. To direct the Executive Committee to increase institutional strengthening support in light of the new commitments related to hydrofluorocarbons under the Amendment;

Energy efficiency

22. To request the Executive Committee to develop cost guidance associated with maintaining and/or enhancing the energy efficiency of low-GWP or zero-GWP replacement technologies and equipment, when phasing down hydrofluorocarbons, while taking note of the role of other institutions addressing energy efficiency, when appropriate;

Capacity-building to address safety

23. To request the Executive Committee to prioritize technical assistance and capacity-building to address safety issues associated with low-GWP or zero-GWP alternatives;

Disposal

24. To request the Executive Committee to consider funding the cost-effective management of stockpiles of used or unwanted controlled substances, including destruction;

Other costs

25. That the parties may identify other cost items to be added to the indicative list of incremental costs emanating as a result of the conversion to low-GWP alternatives;

Exemption for high-ambient-temperature parties

26. To make available an exemption for parties with high ambient temperature conditions where suitable alternatives do not exist for the specific sub-sector of use, as described below;
27. To distinguish and separate this exemption from the essential-use and critical-use exemptions under the Montreal Protocol;
28. To make this exemption effective and available as of the hydrofluorocarbon freeze date, with an initial duration of four years;

To apply this exemption for sub-sectors, contained in Appendix I of this decision, in parties with an average of at least two months per year over ten consecutive years with a peak monthly average temperature above 35 degrees Celsius, where the party listed in Appendix II has formally notified the Secretariat of its

intent to use this exemption no later than one year before the hydrofluorocarbon freeze date, and every four years thereafter should it wish to extend the exemption;^{1,2}

That any party operating under this high-ambient-temperature exemption will report separately its production and consumption data for the sub-sectors to which the exemption applies;

That any transfer of production and consumption allowances for this high-ambient-temperature exemption will be reported to the Secretariat under Article 7 of the Protocol by each of the parties concerned;

That the Technology and Economic Assessment Panel and a subsidiary body of the Panel that includes outside experts on high ambient temperatures will assess the suitability of hydrofluorocarbon alternatives for use where suitable alternatives do not exist based on criteria agreed by the parties that will include, but not be limited to, the criteria listed in paragraph 1 (a) of decision XXVI/9, and recommend sub-sectors to be added to or removed from appendix I to the present decision and report this information to the Meeting of the Parties;

That the assessment referred to in paragraph 32 above will take place periodically starting four years from the hydrofluorocarbon freeze date and every four years thereafter;

To review, no later than the year following receipt of the first report of the Technology and Economic Assessment Panel on the suitability of alternatives, the need for an extension of the high-ambient-temperature exemption for a further period of up to four years, and periodically thereafter, for specific sub-sectors in parties that meet the criteria set out in paragraph 29 above, and that parties will develop an expedited process for ensuring the renewal of the exemption in a timely manner where there are no feasible alternatives, taking into account the recommendation of the Panel and its subsidiary body;

That amounts of Annex F substances that are subject to the high-ambient-temperature exemption are not eligible for funding under the Multilateral Fund while they are exempted for that party;

That the Implementation Committee under the Non-Compliance Procedure of the Montreal Protocol and the Meeting of the Parties should, for 2025 and 2026, defer consideration of the hydrochlorofluorocarbon compliance status of any party operating under a high-ambient-temperature exemption in cases where it has exceeded its allowable consumption or production levels due to its HCFC-22 consumption or production for the sub-sectors listed in appendix I to the present decision, on the condition that the party concerned is following the phase-out schedule for consumption and production of hydrochlorofluorocarbons for other sectors and has formally requested a deferral through the Secretariat;

To consider, no later than 2026, whether to extend the compliance deferral referred to in paragraph 36 for an additional period of two years and, if appropriate, to consider further deferrals thereafter, for parties operating under the high-ambient-temperature exemption;

¹ Spatially weighted average temperatures deriving the daily highest temperatures (using the Centre for Environmental Data Archival: http://browse.ceda.ac.uk/browse/badc/cru/data/cru_cy/cru_cy_3.22/data/tmx).

² As listed in Appendix II to the present decision.

**Other exemptions**

To allow for other exemptions, such as for essential uses and critical uses, for production or consumption that is necessary to satisfy uses agreed by the parties to be exempted uses;

To consider mechanisms for such exemptions in 2029, including multi-year exemption mechanisms;

To provide information and guidance to the Technology and Economic Assessment Panel for its periodic review of sectors where exemptions may be required;

Appendix I: List of exempted equipment for high ambient temperatures

- (a) Multi-split air conditioners (commercial and residential)
- (b) Split ducted air conditioners (commercial and residential)
- (c) Ducted commercial packaged (self-contained) air-conditioners

Appendix II: List of countries operating under the high-ambient-temperature exemption

Algeria, Bahrain, Benin, Burkina Faso, Central African Republic, Chad, Côte d'Ivoire, Djibouti, Egypt, Eritrea, Gambia, Ghana, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Libya, Mali, Mauritania, Niger, Nigeria, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Sudan, Syrian Arab Republic, Togo, Tunisia, Turkmenistan, United Arab Emirates.

ANNEX 4

Recommended simplified format for HFC equipment logbook (based on the format of equipment logbook designed for Central Register of Equipment Operators (CREO) established in Poland)

Equipment logbook									
Date of logbook creation, DD/MM/YYYY									
Name of person who filled out the logbook									
Name of contact person nominated by the Operator									
Phone number and e-mail address of the contact person									
Equipment data				Equipment Operator data					
ASHRAE number of HFC or HFC-containing blend contained in equipment						Operator name			
Quantity of HFC or HFC-containing blend contained in equipment, kg						Operator address			
Quantity of HFC or HFC-containing blend contained in equipment, GWP tons						Operator ID number			
Address of equipment location									
Equipment category*									
Equipment sub-category**									
Equipment name									
Equipment model									
Equipment serial number									
Equipment date of manufacturing									
History of activities									
Date, DD/MM/YYYY						Name of person who made a note on activity			
Date, DD/MM/YYYY						Name of person who made a note on activity			
Date activity started	Date activity ended	Type of activity***	Quantity of HFC, kg		Company which conducted the activity		Technician who conducted the activity		
			Recovered	Added	Name	Address	Name	Certificate No	

*Equipment categories:
 - refrigeration
 - air-conditioning
 - heat pump
 - fire protection
 - containing HFC as solvent

**Equipment sub-categories:
 - industrial
 - commercial
 - other, e.g. office/hospital/school/house

***Type of activity
 - installation
 - leakage checking
 - leakage detector installation
 - maintenance/servicing/repair
 - recovery
 - decommissioning

ANNEX 5

Classification of HFCs, PFCs and HFOs in the CN customs classification system mandatory in the European Union (within HS code 2903 39)¹

CN code	Compound (name)	Compound (common abbreviation or description)
	Fluorinated, brominated or iodinated derivatives of acyclic hydrocarbons	
2903 39	--- Other:	
	--- Bromides:	
2903 39 11	--- Bromomethane (methyl bromide)	
2903 39 15	--- Dibromomethane	
2903 39 19	--- Other	
	--- Saturated fluorides:	
2903 39 21	--- Difluoromethane	HFC-32
2903 39 23	--- Trifluoromethane	HFC-23
2903 39 24	--- Pentafluoroethane and 1,1,1-trifluoroethane	HFC-125 and HFC-143a
2903 39 25	--- 1,1-difluoroethane	HFC-152a
2903 39 26	--- 1,1,1,2-tetrafluoroethane	HFC-134a
2903 39 27	--- Pentafluoropropanes, Hexafluorofluoropropanes and Heptafluoropropanes	Includes HFC-227ea, 236cb, 236ea, 236fa, 245ca, 245fa
2903 39 28	--- Perfluorinated saturated fluorides	All PFCs
2903 39 29	--- Other saturated fluorides	All other saturated HFCs
	--- Unsaturated fluorides:	
2903 39 31	--- 2,3,3,3-tetrafluoropropene	HFC-1,2,3,4yf
2903 39 35	--- 1,3,3,3-tetrafluoropropene	HFC-1,2,3,4ze
2903 39 39	--- Other unsaturated fluorides	All other unsaturated HFCs (HFOs) and all unsaturated PFCs
2903 39 80	--- Iodides	All iodides

Classification of mixtures containing HFCs, PFCs and HFOs in the CN customs classification system mandatory in the European Union (within HS code 3824 78)

CN code	Compound (name)	Compound (common abbreviation or description)
	Mixtures containing halogenated derivatives of methane, ethane or propane	
3824 78	--- Containing perfluorocarbons (PFCs) or hydrofluorocarbons (HFCs), but not containing chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs)	
3824 78 10	--- Containing only 1,1,1-trifluoroethane and Pentafluoroethane	R-507 series
3924 78 20	--- Containing only 1,1,1-trifluoroethane, Pentafluoroethane and 1,1,1,2-tetrafluoroethane	R-404 series
3824 78 30	--- Containing only Difluoromethane and Pentafluoroethane	R-410 series
3824 78 40	--- Containing only Difluoromethane, Pentafluoroethane and 1,1,1,2-tetrafluoroethane	R-407 series
3824 78 80	--- Containing unsaturated hydrofluorocarbons	All mixtures containing unsaturated HFCs (HFOs)
3824 78 90	--- Other	All other mixtures containing perfluorocarbons (PFCs) or hydrofluorocarbons (HFCs), but not containing chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs)

¹ Methyl bromide has also been assigned an individual CN code within 2903 39

ANNEX 6

Customs classification of RAC&HP equipment containing or relying on HFCs

RAC&HP equipment containing or relying on HFCs can be classified in the following chapters of HS :

- In Chapter 84 : in 8415 10, 8415 20, 8415 81, 8415 82, 8415 90, 8418 10, 8418 21, 8418 29, 8418 30, 8418 40, 8418 50, 8418 61, 8418 69, 8418 91, 8418 99, 8419 39, 8419 60, 8419 89, 8434 20, 8438 40, 8438 50, 8438 60, 8438 80, 8438 90, 8458, 8466 93, 8479 10, 8479 60, 8479 82, 8479 89 and 8479 90
- In Chapter 85 : in 8509 80 and 8543 70
- In Chapter 86 : in 8601 10, 8601 20, 8602 10, 8602 90, 8603 10, 8603 90, 8604, 8605, 8606 10, 8606 30, 8606 91, 8606 99, 8607 91, 8607 99 and 8609
- In Chapter 87: in 8701 20, 8701 30, 8701 90, 8702 10, 8702 90, 8703 10, 8703 21, 8703 22, 8703 23, 8703 24, 8703 31, 8703 32, 8703 33, 8703 90, 8704 10, 8704 21, 8704 22, 8704 23, 8704 31, 8704 32, 8704 90, 8705 10, 8705 20, 8705 30, 8705 40, 8705 90, 8706, 8708 99, 8709 11, 8709 19, 8709 90, 8710, 8716 10, 8716 20, 8716 31, 8716 39, 8716 40, 8716 80 and 8716 90
- In Chapter 88 : in 8801, 8802 11, 8802 12, 8802 20, 8802 30, 8802 40, 8802 60, 8803 30, 8803 90, 8805 21 and 8805 29
- In Chapter 89 : in 8901 10, 8901 20, 8901 30, 8901 90, 8902, 8903 91, 8903 92, 8903 99, 8904, 8905 10, 8905 20, 8905 90, 8906 10, 8906 90, 8907 90 and 8908
- In Chapter 90 : in 9018 90, 9031 80, 9031 90, 9032 10, 9032 90 and 9033
- In Chapter 94 : in 9406

In the European Union it was decided that only the most commonly traded equipment pre-charged with HFCs will be assigned specific codes in the extended (10 digits) customs classification system (TARIC) while any other equipment containing HFCs has to be declared by the importer in the customs documentation – in box No. 44 of the Single Administrative Document (SAD) which must be filled for customs clearance.

In the table below the new TARIC codes for RAC&HP equipment pre-charged with HFCs are shown in red font.

TARIC classification of RAC&HP equipment pre-charged with HFCs

Chapter 84	NUCLEAR REACTORS, BOILERS, MACHINERY AND MECHANICAL APPLIANCES; PARTS THEREOF
8415 00 00 00	Air-conditioning machines, comprising a motor-driven fan and elements for changing the temperature and humidity, including those machines in which the humidity cannot be separately regulated
8415 10 00 00	- Of a kind designed to be fixed to a window, wall ceiling or floor, self-contained or 'split-system'
8415 10 10 00	-- Self-contained
8415 10 10 10	--- Pre-charged with hydrofluorocarbons (HFCs)
8415 10 10 90	--- Other
8415 10 90 00	-- Split-system
8415 10 90 10	--- Pre-charged with hydrofluorocarbons (HFCs)
8415 10 90 90	--- Other
8415 20 00 00	- Of a kind used for persons, in motor vehicles
8415 20 00 10	-- Pre-charged with hydrofluorocarbons (HFCs)
8415 20 00 90	-- Other
	- Other
8415 81 00 00	-- Incorporating a refrigerating unit and a valve for reversal of the cooling/heat cycle (reversible heat pumps)
8415 81 00 10	--- For use in civil aircraft
	--- Other
8415 81 00 91	--- Pre-charged with hydrofluorocarbons (HFCs)
8415 00 00 99	--- Other
8415 82 00 00	-- Other, incorporating a refrigerating unit
8415 82 00 10	--- For use in civil aircraft
	--- Other
8415 82 00 91	--- Pre-charged with hydrofluorocarbons (HFCs)
8415 82 00 99	--- Other
8415 90 00 00	- Parts
	-- Other
8415 90 00 91	--- Pre-charged with hydrofluorocarbons (HFCs)
8415 90 00 99	--- Other
8418 00 00 00	Refrigerators, freezers and other refrigerating or freezing equipment, electric or other; heat pumps other than air-conditioning machines of heading 8415
8418 10 00 00	- Combined refrigerator-freezers, fitted with separate external doors
8418 10 20 00	-- Of a capacity exceeding 340 litres
8418 10 20 10	--- For use in civil aircraft
	--- Other
8418 10 20 91	--- Pre-charged with hydrofluorocarbons (HFCs)
8418 10 20 99	--- Other
8418 10 80 00	-- Other
8418 10 80 10	--- For use in civil aircraft
	--- Other
8418 10 80 91	--- Pre-charged with hydrofluorocarbons (HFCs)
8418 10 80 99	--- Other

Chapter 84

NUCLEAR REACTORS, BOILERS, MACHINERY AND MECHANICAL APPLIANCES; PARTS THEREOF

8418 21 00 00	- Refrigerators, household type
	-- Compression type
8418 21 10 00	--- Of a capacity exceeding 340 litres
8418 21 10 10	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 21 10 90	---- Other
	-- Other
8418 21 51 00	--- Table model
8418 21 51 10	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 21 51 90	---- Other
8418 21 59 00	--- Building in type
8418 21 59 10	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 21 59 90	---- Other
8418 21 91 00	--- Other, of a capacity
8418 21 91 10	---- Not exceeding 250 litres
8418 21 91 90	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 21 99 00	---- Other
8418 21 99 10	---- Exceeding 250 litres, but not exceeding 340 litres
8418 21 99 90	---- Pre-charged with hydrofluorocarbons (HFCs)
	---- Other
8418 29 00 00	-- Other
8418 29 00 10	--- Pre-charged with hydrofluorocarbons (HFCs)
8418 29 00 90	--- Other
8418 30 00 00	- Freezers of the chest type, not exceeding 800 litres capacity
8418 30 20 00	-- Of a capacity not exceeding 400 litres
8418 30 20 10	--- For use in civil aircraft
	--- Other
8418 30 20 91	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 30 20 99	---- Other
8418 30 80 00	-- Of a capacity exceeding 400 litres, but not exceeding 800 litres
8418 30 80 10	--- For use in civil aircraft
	--- Other
8418 30 80 91	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 30 80 99	---- Other
8418 40 00 00	- Freezers of the upright type, not exceeding 900 litres capacity
8418 40 20 00	-- Of a capacity not exceeding 250 litres
8418 40 20 10	--- For use in civil aircraft
	--- Other
8418 40 20 91	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 40 20 99	---- Other
8418 40 80 00	-- Of a capacity exceeding 250 litres, but not exceeding 900 litres
8418 40 80 10	--- For use in civil aircraft
	--- Other
8418 40 80 91	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 40 80 99	---- Other
8418 50 00 00	- Other furniture (chests, cabinets, display counters, showcases and the like) for storage and display, incorporating refrigerating or freezing equipment
	-- Refrigerated showcases and counters (incorporating a refrigerating unit or evaporator)
8418 50 11 00	--- For frozen food storage
8418 50 11 10	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 50 11 90	---- Other
8418 50 19 00	--- Other
8418 50 19 10	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 50 19 90	---- Other
8418 50 90 00	-- Other refrigerating furniture
8418 50 90 10	--- Pre-charged with hydrofluorocarbons (HFCs)
8418 50 90 90	--- Other
8418 61 00 00	-- Heat pumps other than air conditioning machines of heading 8415
8418 61 00 10	--- For use in civil aircraft
	--- Other
8418 61 00 91	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 61 00 99	---- Other
8418 69 00 00	-- Other
8418 69 00 10	--- For use in civil aircraft
	--- Other
8418 69 00 91	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 69 00 99	---- Other



Chapter 84

NUCLEAR REACTORS, BOILERS, MACHINERY AND MECHANICAL APPLIANCES; PARTS THEREOF

	- Parts
8418 91 00 00	-- Furniture designed to receive refrigerating or freezing equipment
8418 99 00 00	-- Other
8418 99 10 00	--- Evaporators and condensers, excluding those for refrigerators of the household type
8418 99 10 10	---- for use in certain types of aircraft
	---- Other
8418 99 10 51	----- Evaporator composed of aluminium fins and a copper coil of the kind used in refrigeration equipment
8418 99 10 59	----- Pre-charged with hydrofluorocarbons (HFCs)
	----- Other
8418 99 10 61	----- Condenser composed of two concentric copper tubes of the kind used in refrigeration equipment
8418 99 10 69	----- Pre-charged with hydrofluorocarbons (HFCs)
	----- Other
8418 99 10 81	----- Other
8418 99 10 87	----- Pre-charged with hydrofluorocarbons (HFCs)
8418 99 10 87	----- Other
8418 99 90 00	--- Other
8418 99 90 10	---- Of refrigerating equipment adapted to the air-conditioning system, for use in certain types of aircraft
	--- Other
8418 99 90 91	---- Pre-charged with hydrofluorocarbons (HFCs)
8418 99 90 99	---- Other



For more information, contact :

OzonAction
UN Environment Economy Division

1, rue Miollis, Building VII
75015 Paris, France

Tel: +33 1 44 37 14 50

Fax: +33 1 44 37 14 74

Email: ozonaction@unep.org

www.unep.org/ozonaction/

Legislative and Policy Options to Control Hydrofluorocarbons

The Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer reached an historic agreement on 15 October 2016 in Kigali, Rwanda to phase down hydrofluorocarbons (HFCs) according to an agreed schedule. To achieve this goal, the countries that belong to this multilateral environmental agreement should develop, enact and enforce different legislative and policy measures to facilitate a smooth HFC phase-down process. This booklet provides developing countries with a suite of different options that they may wish to consider, including both mandatory and voluntary approaches. The options include monitoring and controlling trade (import quotas and exemption from quotas), mandatory reporting by HFC importers and exporters, as well as different types of bans and restrictions concerning HFCs and products and equipment containing or relying on HFCs. Other parts describe HFC use restrictions, record keeping on HFCs and HFC-containing products and equipment, HFC emission control measures and capacity-building and awareness-raising options. The options are not meant to be prescriptive but rather to provide a menu of options that countries may pick and choose from depending on their national circumstances. This guide complements the previous OzonAction publication, HCFC Policy & Legislative Options: A Guide for Developing Countries (2010).

