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HCFC Phase Out Strategy of the Republic of Belarus until 2020

**CHAPTER 1**

**GENERAL PROVISIONS**

HCFC Phase Out Strategy of the Republic of Belarus until 2020 (hereinafter - Strategy) has been developed on the basis of clause 12 of the Set of measures for effective use of natural resources and enhancement of the role played by MNREP in coordination of activities of state and local authorities approved by the decision of MNREP Board No. 132-P dated 27.12.2011 and in compliance with the Law of the Republic of Belarus of November 12, 2001 "On Protection of the Ozone Layer", the Law of the Republic of Belarus of November 14, 2005 "On Approval of the Domestic and Foreign Policy Guidelines of the Republic of Belarus", Decree of the President of the Republic of Belarus of July 22, 2010 No. 378 "On Approval of Priority Areas of Scientific and Technological Activities in the Republic of Belarus for 2011 – 2015", Montreal Protocol on Substances that Deplete the Ozone Layer of September 16, 1987, Agreement on Creation of a Single Customs Territory and Formation of the Customs Union ratified by the Law of the Republic of Belarus of July 9, 2008 as well as other laws, regulations and international treaties addressing the problem of ozone layer protection.

The Strategy is designed to ensure the ozone layer protection by taking preventive measures aimed at sustainable consumption of ozone depleting substances in order to fully meet the commitments of the Republic of Belarus in compliance with Decision XIX/6 of the meeting of Montreal Protocol Parties on ozone depleting substances and accelerated HCFC phase out. The ultimate goal of this initiative is to stop the consumption of ozone depleting substances by 2020 followed by collection and storage of ozone depleting substances extracted from mechanisms, equipment, containers and other devices in the course of their technical maintenance or prior to their disposal (hereinafter - reclaimed ozone depleting substances), processing of ozone depleting substances through primary treatment for recycling purposes at ozone depleting substance disposal sites (hereinafter - recycled ozone depleting substances), reprocessing and enhancement of properties of reclaimed ozone depleting substances through filtration, drying, distillation and chemical treatment in order to make their characteristics compliant with the requirements of relevant technical laws and regulations (hereinafter - recovered ozone depleting substances).

The Strategy contains a detailed description of:

the existing system of regulation and special measures to control hydrochlorofluorocarbons (hereinafter - HCFC);

actual HCFC consumption data based on the information provided by economic agents regarding their use of ozone depleting substances;

HCFC consumption records, available equipment and products manufactured using HCFC;

HCFC consumption and distribution data with a per-sector breakdown;

ozone layer protection goals until 2020 and objectives that need to be accomplished to reach them;

HCFC phase out priorities;

expected results to be achieved by implementing the Strategy.

**CHAPTER 2**

**Grounds for regulating the use of ozone depleting substances**

Atmospheric ozone plays a critical role in the existence of life on the Earth. Modern research methods register its presence at heights of up to 100 km from the Earth surface. The bulk of it spread within the range of 10 to 50 km, and the maximum concentration is reached in stratosphere at the height of 19-23 km. It is this part of ozone that forms the so called ozone layer.

The state of the stratospheric ozone layer has been closely monitored by scientists from all over the world since early 20th century. Late 1970s saw the discovery that ozone contained in the stratosphere and constantly generated and destroyed in conditions of dynamic equilibrium achieved by natural photochemical reactions started steadily dwindling at the rate of 0.4-0.5 % a year.

This resulted in increased exposure of the Earth surface to ultraviolet radiation that caused global impact on the course of biological processes and particularly human health. The main culprit was massive contamination of the upper layers of the atmosphere with chlorine and bromine containing chemicals that are generally known as ozone depleting substances (hereinafter – ODS). Their ability to destroy the ozone layer is characterized by the so-called ozone depleting potential (hereinafter – ODP). The ODP of the most common chlorofluorocarbon (CFC-11) was taken as a base unit (1.0). The ODP of all other substances was calculated based on CFC-11 ODP with the highest ODP assigned to the most ozone damaging substance. In addition, each ODS has the so-called global warming potential – a ratio that defines the degree of ODS [global warming](http://ru.wikipedia.org/wiki/%D0%93%D0%BB%D0%BE%D0%B1%D0%B0%D0%BB%D1%8C%D0%BD%D0%BE%D0%B5_%D0%BF%D0%BE%D1%82%D0%B5%D0%BF%D0%BB%D0%B5%D0%BD%D0%B8%D0%B5) impact over a period of time. Global warming potential of the most common [carbon dioxide](http://ru.wikipedia.org/wiki/%D0%9E%D0%BA%D1%81%D0%B8%D0%B4_%D1%83%D0%B3%D0%BB%D0%B5%D1%80%D0%BE%D0%B4%D0%B0%28IV%29)  (CO2) was taken as a base unit (1.0).

Vienna Convention for the Protection of the Ozone Layer of March 22, 1985 that came into force for the Republic of Belarus on September 22, 1988 is the international document that contains measures to protect the ozone layer. The next step in the ozone layer protection was made by enactment of the Montreal Protocol on Substances that Deplete the Ozone Layer of September 16, 1987 (hereinafter – Montreal Protocol). Since by that time the destructive effect of chlorine and bromine was already supported by substantial evidence, the appendices to the Montreal Protocol were supplemented with a list of ODS subject to regulation by all Signatories.

Later years saw the adoption of a number of amendments to the Montreal Protocol that introduced additional stringent requirements for regulation of reduction in ODS consumption: London Amendment (June 1990), Copenhagen Amendment (November 1992), Montreal Amendment (September 1997) and Beijing Amendment (December 1999).

Initially, London amendment started the process of phasing out the most common and hazardous ODS known as chlorofluorocarbons (hereinafter – CFC), halons (Annex A to the Montreal Protocol), tetrachloromethane (Annex B to the Montreal Protocol) and many other chlorinated chemicals. Later amendments, and particularly Copenhagen Amendment, called for phase out of other chemical substances, such as methyl bromide, as well as a class of "transitional" ODS known as hydrochlorofluorocarbons. They were used as refrigerants, blowing agents, fire suppressants, and solvents and, in case of methyl bromide, decontaminating agents for quarantined facilities and quarantined products.

Consistent with the global experience, the CFC replacement technology was largely based on transitional refrigerants (mainly HCFC-22 in new refrigeration equipment) and mixture substitutes CFC-12 based on HCFC-22 in obsolete refrigeration equipment a substantial part of which is still operational. HCFC-141b became widely used in production of blowing agents as a CFC substitute.

HCFC have a relatively low ODP. The most common HCFC-22, HCFC-141b, and HCFC-142b have ODP of 0.055, 0.11, and 0.065 respectively. Due to official agreement to use the above substances as substitutes for CFC and other ODS with a high ODP, their phase out requirements imposed under the Copenhagen Amendment were relatively soft, particularly for developing countries. However, in 2007, when the phase out of ODS specified in Annexes A and B of the Montreal Protocol was nearing completion globally, the Parties to the Montreal Protocol at their 19th meeting agreed to accelerate the HCFC phase out phase under Decision XIX/6. The rapidly growing use of HCFC and their considerable contribution to the global warming became the primary reason for adopting Decision XIX/6.

**CHAPTER 3**

**Analysis of Montreal Protocol compliance in the Republic of Belarus**

The Republic of Belarus was among the first countries to sign the Vienna Convention and the Montreal Protocol on Substances that Deplete the Ozone Layer. By signing the Montreal Protocol on January 22, 1988 (it came into force for the Republic of Belarus on January 1, 1989), Belarus undertook to reduce and phase out the consumption of ODS. Later, with the ratification of the London Amendment (Decree of the Supreme Council of the Republic of Belarus of March 29, 1996 No. 150-XIII "On Ratification of Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer"), adoption of the Copenhagen, Montreal and Beijing amendments to the Montreal Protocol (under Law of the Republic of Belarus of December 18, 2006 "On Adoption of Amendments to the Montreal Protocol on Substances that Deplete the Ozone Layer"), the Republic of Belarus expanded the list of regulated ODSs and set specific conditions for ODS reduction and/or phase out for each ODS group.

Belarus is a developed country or Article 2 Party to the Montreal Protocol and all the amendments to it, and, at the present time, it is in compliance with all its obligations under this international agreement.

Historically, Republic of Belarus did not produce ODS, although like the majority of industrially developed countries it was an ODS consumer and still continues consuming HCFCs. As a result, the country’s main efforts have and continue to be aimed at reducing and eliminating the use of such substances and replacing them with non-ODS alternatives. The main historical uses of ODS have been in the manufacture of refrigeration equipment, as a blowing agent in production of heat-insulating materials, as a solvent in metal parts and electronics cleaning during manufacturing processes, and in repair and maintenance of refrigeration and air conditioning equipment.

Belarus carried out the first stage of ODS consumption reductions between 1996 and 2000. The main ODS consumption reduction phase was completed between 1996 and 2000. Thus, between 1993 and 1995, MNREP developed a National Program to end the use of ozone depleting substances in Belarus, specifically in respect to the London Amendment and the Phase out of Annex A and B substances. This Program was formally adopted by Degree of the Cabinet of Ministers No.115 dated 19.02.1996.

Implementation of ODS phase out measures at the country's enterprises enabled introduction of the latest technological equipment, phasing out of over 600 tons of ODS, significant improvement of the technical level of manufactured products, creation of a system of ODS licensing regulation introduced and operating since 1997, control over the import of ODS and ODS containing substances into the country, inclusion of rather stringent sanctions against the industrial and tertiary sectors economy for using ODS into the Administrative Violations Code of the Republic of Belarus.

Under the Vienna Convention for the Protection of the Ozone Layer, monitoring of the ozone layer has been set up over the territory of the republic and the biological activity of solar ultraviolet radiation is being studied through the National Ozone Monitoring Research & Education Center of the Belarusian State University that conducts research on the atmospheric ozone.

Overall, Belarus achieved the distinction of being the first country in the Former Soviet Union to meet its London Amendment obligations for Annex A and B ODS phase out. Fulfillment of these international obligations enabled the Republic of Belarus to be viewed as one of the most advanced countries in the region in addressing the ODS issues.

However, there are some restrictions related to the Agreement on Creation of a Single Customs Territory and Formation of the Customs Union that impede effective control over HCFC imports and movement of HCFC-containing equipment and products within the Customs Union. Therefore, the Republic of Belarus employs the HCFC control and consumption assessment methodology for HCFC end users based on HCFC consumption limits specified in licensing documents issued for activities that affect the environment through use of ozone depleting substances. This approach was used for preparation and submission of reports to the Secretariat of the Montreal Protocol during 2009-2011, as well as for development of this strategy.

Implementation of measures to phase out CFCs was accompanied by a minor increase in HCFC consumption during refrigeration equipment maintenance (HCFC-22), manufacturing of heat-insulating materials, foam material and solvents (HCFC-141b). In early 2000th, implementation of anti-CFC measures triggered an increase in HCFC consumption related to the modernization efforts and development of new infrastructure that requires more refrigeration and introduction of air conditioning equipment. Modernization of buildings, development of the consumer goods manufacturing market and a public catering system as well as multiple increase in the use of home air conditioners that became affordable to wider population – all these factors caused a major boost in HCFC consumption.

In compliance with undertaken commitments (Article 2F: hydrochlorofluorocarbons of the Montreal Protocol and Decision XIX/6 "Amendments to the Montreal Protocol with regard to the substances included into group I of Annex C (hydrochlorofluorocarbons)" the Republic of Belarus is obliged to reduce the HCFC consumption at the following rate:

for the period of 12 months effective January 1, 2004 and for each consecutive 12-months period until January 1, 2010 the annual expected HCFC consumption level cannot exceed sixty five percent of the baseline consumption level[[1]](#footnote-1), i.e. the consumption level [[2]](#footnote-2) of 2004 must drop by 35% to the baseline level (by 17,821 MT ODP to the level of 33,096 МТ ODP);

for the period of 12 months effective January 1, 2010 and for each consecutive 12-months period until January 1, 2015 the annual expected HCFC consumption level cannot exceed twenty five percent of the baseline consumption level, i.e. the consumption level of 2010 must drop by 75% to the baseline level (by 38,188 MT ODP to the level of 12,729 МТ ODP);

for the period of 12 months effective January 1, 2015 and for each consecutive 12-months period until January 1, 2020 the annual expected HCFC consumption level cannot exceed twenty five percent of the baseline consumption level, i.e. the consumption level of 2015 must drop by 90% to the baseline level (by 45,825 MT ODP to the level of 5,092 МТ ODP);

for the period of 12 months effective January 1, 2015 and for each consecutive 12-months period until January 1, 2020 the annual expected HCFC consumption level cannot exceed twenty five percent of the baseline consumption level, i.e. the consumption level of 2015 must drop by 99,5% to the baseline level (by 50,912 MT ODP to the level of 0,005 MT ODP), with the expected HCFC consumption during 2020-2030 to be at the level of 0,5 percent of the baseline level for equipment maintenance (or 0,005 MT ODP annually).

HCFC consumption in the Republic of Belarus for 2010, calculated based on reports submitted by economic agents, amounted to 10,002 MT ODP, which is lower than the target value of 12,729 MT ODP set in compliance with the obligations under the Montreal Protocol. The table below provides detailed information about the actual HCFC consumption in the Republic of Belarus during 1989-2011.

Table. HCFC consumption trends in the Republic of Belarus

| Year | ODS consumption, MT | Total HCFC consumption,MT | Total HCFC consumption,MT ODP  | Consumption limit,MT ODP |
| --- | --- | --- | --- | --- |
| CFC | Halons | HCFC-22 | HCFC-21[[3]](#footnote-3) | HCFC-141b[[4]](#footnote-4) | HCFC-142b\* |
| 1989 | 2510.9 | 278.4 | 54.5 | - | - | - | 54.5 | 3.0 | 50,917 BCL |
| 1991 | 1679.6 | 321.2 | 55.0 | - | - | 0.9 | 56.1 | 3.1 | n/a |
| 1992 | 1185.4 | 236.4 | 29.5 | - | - | 0.9 | 30.7 | 1.7 | n/a |
| 1996 | 914.2 | 220.8 | 18.4 | - | - | 0.6 | 57.0 | 5.3 | n/a |
| 2000 | 523.5 | 23.9 | 217.6 | 16.2 | 1.92 | 51.1 | 286.82 | 16.149 | n/a |
| 2004 | 0.0 | 0.0 | 556.8 | 1.512 | 9.6 | 15.14 | 583.052 | 32.725 | 33.096 |
| 2010 | 0.0 | 0.0 | 138.78 | 3.635 | 7.33 | 21.813 | 171.558 | 10.002 | 12.729 |
| 2011 | 0.0 | 0.0 | 123.067 | 3.403 | 7.16 | 20.416 | 154.046 | 9.019 | 12.729 |

In 2010, the consumption of mixture substitutes based on HCFC-22/HCFC-21/HCFC-142b reached 42%, whereas the consumption of pure HCFC-22 amounted to 54%. This implies that a considerable amount of obsolete equipment based on CFC-12 technology continues operating.

HCFCs are used in all regions of the country with the highest consumption levels in the city of Minsk as well as Brest and Minsk regions. Given the services sector dominance, the HCFC use related to refrigeration equipment maintenance constitutes 70% and 26% for air conditioning equipment.

HCFC consumption is distributed among many economic sectors with agricultural production and food production topping the list (30% each) followed by industrial enterprises (up to 19%) and enterprises of the Belarusian railways (up to 11%).

At the moment one can observe a steady increase in the use of ODS alternatives, primarily in the refrigeration sector. There are some non-ODS substances available in the country's market. These are largely hydrofluorocarbons (HFC) and particularly HFC-134a and HFC-404a.

The Republic of Belarus does not have production facilities capable of manufacturing HCFC-consuming equipment (except air conditioners and thermal pumps). At present, HCFC-consuming products with competitive prices can only be found in the split systems and air conditioning sector. As far as alternative HCFC substitutes are concerned, all major HCFC applications in Belarus have affordable alternatives that are freely available both: in the European Union and in the local and Russian markets. The country already uses the majority of these alternatives. Hence, there are no significant barriers to HCFC replacement and the main technological problem is to choose between cheaper equipment and its more affordable baseline option with HFC. As for introduction of latest equipment with natural refrigerants featuring low global warming potential, they are also well represented on the market.

**CHAPTER 4**

**Goals and objectives of the Strategy**

The strategic goal in the field of ozone layer protection is to end HCFC consumption, ensure unconditional fulfillment of Belarus' commitments under Decision XIX/6 "Amendments to the Montreal Protocol with regard to the substances included into group I of Annex C (hydrochlorofluorocarbons)" taking into account the minimization of impact produced by HCFC alternatives on the climate change and consequent use of reclaimed, recycled and recovered ozone depleting substances.

To meet the targets specified in the Strategy and fulfill the commitments of the Republic of Belarus for reduction of HCFC consumption (annex to the Strategy) one will need to apply a comprehensive approach to the solution of organizational, legal, financial, and economic problems in view of the following objectives:

identifying effective ways of phasing out the use of HCFCs;

replacing HCFCs with their modern alternatives;

maximizing the use of alternative HCFCs that involve the least climate change impact consistent with relevant global climate agreements;

introducing equipment designed for disposal, recycling and recovery of ozone depleting substances;

enhancing the competitiveness and efficiency of Belarus by achieving modern standards of manufacture and use associated with refrigerants, blowing agents and solvents such that exports are not affected by trade restrictions;

ensuring the delivery of required results with optimal costs related to introduction of non-ODS technologies as well as HCFC recycling, recovery and decontamination technologies;

updating legislative and reporting capacity to accurately monitor and control HCFC circulation in accordance with the requirements of the Montreal Protocol;

ensure accurate reporting of HCFC consumption to the Secretariat of the Montreal Protocol.

Preparation and implementation of measures to end HCFC consumption require certain amendments and addenda to existing laws and regulations and creation of new economic mechanisms designed to ensure the accomplishment of objectives listed above. Thus, as far as licensing and HCFC consumption limits are concerned, the country still does not impose any restrictions on the imports of HCFCs and HCFC-containing equipment in spite of the fact that Decision XIX/6 "Amendments to the Montreal Protocol with regard to the substances included into group I of Annex C (hydrochlorofluorocarbons)" dictates the need to change the system of ODS amount restriction in licenses for activities negatively affecting the environment. This impact is largely associated with ODS use and primarily concerns economic agents that maintain and repair equipment containing HCFCs.

Conversion of production processes and equipment to non-ODS substances is nominally viewed as one the priorities in the legislation. However, until now it has had a very limited application mainly due to the high cost of such technologies and lack of accessible information about HCFC-using alternatives to the existing technologies. Introduction of any new production facility utilizing non-ODS technologies is largely achieved by prohibiting the use of HCFC-containing equipment. The main factor restraining the conversion to non-ODS technologies is the lack of a detailed registry of HCFC-containing equipment that could become the basis for a conversion plan. The MNREP has already started working in this area. MNREP's have developed reporting forms No. 2-OS (ozone depleting substances), conducted research titled "Report on production processes and equipment involving ozone depleting substances and (or) their substitutes" that should become the foundation for further research and creation of a system designed to keep records of the equipment used in the country. The registration system employed in the EU to manage HFCs could be used for these purposes.

In terms of import licensing and customs control, starting from 2010, there have been certain problems with customs control in the Customs Union. Due to absence of necessary legal acts in the Russian Federation and Kazakhstan the provisions of the Agreement on licensing rules in foreign trade in goods are not fully observed in the Customs Union, which lowers the level of control over ODS imports from the Russian Federation and Kazakhstan. There are also problems related to the use of customs codes for HCFC identification, including identification of HCFCs contained in imported products, as well as problems connected with analytical control of ODS content in products transported across borders.

Given the active use of HFC as an alternative to HCFC as well as efforts of certain countries to lobby the amendment of the Montreal Protocol, and specifically its provisions that govern the regulation of HFCs with a high global warming potential, one needs to start regulating the HFC imports.

**CHAPTER 5**

**HCFC phase out priorities**

Belarus has significant but relatively easily manageable HCFC consumption in terms of undertaking its orderly phase out. While consumption continues to be sustained in refrigeration servicing and at a modest level in manufacturing, there is a consistent trend of progressive reduction in actual HCFC consumption. This performance is generally superior to any other country of the former Soviet Union and many countries of article 5 of the Montreal Protocol that have a higher GDP level. It is largely attributable to the adoption of progressive regulatory measures that initiated the change in technology from HCFCs to non-ODS alternatives. It is also reflective of a forward-looking view by Belarusian consumers in technology selection by opting for the most modern and efficient technologies as opposed to what might be cheapest at the time.

To sustain the good progress toward eliminating HCFC consumption, a range of actions on the part of MNREP and economic agents need to be taken. They will help form the basis for accomplishment of objectives set forth in the Strategy and these are:

***Enhancing the ability to control imports:*** Due to creation of the Customs Union, Belarus presently has limited ability to control HCFC imports. One needs to develop and adopt a trilateral agreement (between the Republic of Belarus, the Russian Federation and Kazakhstan) on movement and keeping records of ozone depleting substances and products that contain them in the course of mutual trade between the Customs Union member states.

***Imposing limitations in regulation of HCFC consumption:*** The currently existing system of indicating ODS sales/purchase amounts in licensing documents proved to be effective not only in foreign trade but also in HCFC distribution and use inside the country. To enable HCFC management and collection of accurate and detailed HCFC consumption data, one needs to enhance and expand this ability by set-by-step long-term quantitative reduction of ODS amounts in licenses for activities affecting the environment, and namely ODS consumption, issued to economic agents that own HCFC-containing equipment and economic agents involved in technical maintenance and repairs of HCFC-containing equipment.

Previous stock taking of ODS-using equipment was carried out in 2004 and in order to take informed managerial decisions one needs to create a database of currently operating equipment that contains HCFCs so that it could be phased out later.

***Enhancing technical, education and institutional potential:*** A steady trend for ODS phase out in Belarus requires constant support of its historically strong institutional potential in the field that has somewhat degraded lately. This can pose a serious risk for further ODS phase out promotion. One needs to perform a detailed assessment of the law enforcement practice in the ozone layer protection field in order to prepare by 2013 a set of amendments to the Law of the Republic of Belarus of November 12, 2001 "On the Ozone Layer Protection".

At present, border crossings in the Republic of Belarus do not have equipment to identify HCFCs, including those contained in imported products. Given the constantly decreasing HCFC consumption, this can lead to the situation when these substances will be imported to the Republic of Belarus disguised as non-ODS substances. Therefore, one needs to provide border crossings of the Republic of Belarus with equipment capable of HCFC identification and teach customs personnel how to identify HCFC content in goods imported to the Republic of Belarus from third countries.

Particular attention should be paid to boosting the potential of the refrigeration industry, integration of components designed to increase the energy efficiency and cut greenhouse gas emissions, development of information materials, curriculum modules, training of national instructors (trainers), refrigeration technicians specializing on HCFCs and their substitutes, instruction in the matters of energy saving and reduction of greenhouse gas emissions, integration of educational programs into the professional development programs for the Belarusian teaching staff.

***Complete HCFC phase out in the production sector:***  Application of obsolete technologies in the industrial sector coupled with residual use of HCFCs degrades the product competitiveness and reduces the chances of reaching foreign markets in the future. Nowadays, HCFC-141b is used as a blowing agent. Technological options include a number options involving direct replacement of the blowing agent. This procedure is associated with relatively low capital expenditures but in the long run it may entail significantly higher operating costs due to rather high prices on alternative chemicals – HFC-134a, HFC-245fa and HFC-365mfc. These blowing agents, however, have a relatively high global warming potential. More recent developments are formulations based on hydrofluoroolefins (HFO). They are now widely available offering low GWP and zero ODP. Another recent prospective option is methyl formate that has negligible global warming potential but to date only has limited availability in Europe. The most commonly used blowing agent in larger scale operations is hydrocarbon technology based on cyclopentane and which has extensive use in Belarus (Atlant). The limitation of this technology is the high capital cost of the conversion due to its flammable properties and required additional infrastructure and safety measures.

Thus, there is a wide range of technological options for HCFC-141b replacement that requires a detailed analysis of costs and benefits as well as an expert evaluation of the applicability of this or that technology at existing production facilities. On needs to conduct a detailed analysis of possible measures to retrofit the HCFC-based production processes by introducing non-ODS technologies.

While Belarus is effectively introducing non-ODS alternatives in the form of HFC based technology, there is limited penetration of newer low global warming potential technology except in domestic refrigeration (hydrocarbons) and a few large industrial refrigeration applications (ammonia). This technology will increasingly be the international standard in markets in which Belarus will compete. State authorities and economic agents that own HCFC-containing equipment must therefore develop an incentive program for owners of industrial and commercial refrigeration equipment, including the system of equipment retrofitting/replacement as well as demonstration and promotion of low global warming potential technologies.

***Creating and improving the refrigerants (HCFC) management (handling) system:*** Given that refrigeration equipment maintenance remains the dominant technological application of HCFCs, one needs to support and tighten the control over refrigerants in the country in a bid to ensure their maximum recovery and reuse as well as ability to implement alternative technologies and ultimately destroy completely used up refrigerants that are no longer fit for further use.

***Developing measures to reduce the use of ozone depleting substances for one's own needs:***  Due to the fact that licenses for activities affecting the environment through ODS consumption are issued to economic agents (owners of HCFC-containing equipment) for a 5-year term and by 2015 the ODS consumption must be reduced from 12,729 МТ ODP to 5,092 МТ ODP, the licenses issued since 2009 have a requirement to approve and conduct measures aimed at reduction of ODS consumption by 25% by 2015. However, the data on actual ODS consumption in 2010 and 2011 reveals insufficiency of such reduction. Therefore, one must review the HCFC use reduction requirements during the period until 2020.

***Reducing the use of ozone depleting substances during technical maintenance and repairs:***  Licenses for activities affecting the environment, and specifically ODS consumption, issued to economic agents involved in technical maintenance and repairing of HCFC-containing equipment do not set any particular requirements and conditions for the reduction of ODS consumption. Due to the fact that in compliance with Decision XIX/6 of the meeting of Parties to the Montreal Protocol after January 1, 2020 HCFC import to the Republic of Belarus will be banned, one will have to specify (for equipment maintenance and repair purposes) the requirements for the reduction of ODSs that might be used during maintenance and repairing of HCFC-containing equipment as well as ensure maximum use of reclaimed, recycled and recovered ozone depleting substances.

**CHAPTER 6**

**Deliverables**

Practical implementation of the Strategy involves the need to address specific problems by means of the following measures.

***Enhancing the ability to control imports:*** One needs to develop and adopt a trilateral agreement (between the Republic of Belarus, the Russian Federation and the Republic of Kazakhstan) on movement and keeping records of ozone depleting substances and products that contain them in the course of mutual trade between the Customs Union member states. In addition, there are plans to create an electronic tracking system for ODS imports from third countries and Customs Union member states, establish control over ODS movement and use within the Customs Union supported by an electronic database of importers, wholesalers, economic agents that own HCFC-containing equipment and economic agents involved in technical maintenance and repair of HCFC-containing equipment.

***Imposing limitations in regulation of HCFC consumption:*** There are plans to impose ODS consumption limits of up to 0.02 МТ ODP from 2013 and up to 0.01 МТ ODP from 2016 when issuing licenses to economic agents that plant to carry out activities affecting the environment through ODS consumption. It is planned to analyze the compliance of economic agents (owners of HCFC-containing equipment that already have a valid license) with special requirements and conditions in terms of measures to reduce ODS consumption and in case of failure to meet those special requirements and conditions decisions will be made to terminate such licenses.

It is expected:

to develop measures to prohibit the trade in used HCFCs and used HCFC-containing equipment on the country's wholesale and retail markets;

to impose limits on the dimensions of containers (cylinders) containing HCFCs imported to the Republic of Belarus and to ban the use of disposable cylinders in the country on the wholesale and end user levels. The efficiency of small containers stems from their ease of use for maintenance personnel. Besides, reusable containers can be refilled or replaced by distributors. Determination of the size should be subject to consultation with importers;

to revise and adapt standards that govern the handling of refrigerants as well as maintenance rules for refrigerating units. This will mainly involve registration of installations, mandatory log books being maintained detailing servicing history, banning of refrigerant venting, and qualification/certification requirements imposed on technicians servicing the equipment;

to investigate the production processes and equipment based on ozone depleting substances and (or) their substitutes.

***Enhancing technical, education and institutional potential:*** There are plans to conduct a detailed assessment of the law enforcement practice in the field of ozone layer protection and introduce in 2013 a set of amendments and addenda to the Law of the Republic of Belarus of November 12, 2001 "On the Protection of the ozone Layer", revise the Instruction for handling of ozone depleting substances approved by the Decree of the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus No. 122 dated 19.12.2008 in order to formulate more explicit rules for handling used ozone depleting substances and HCFC-containing equipment.

It is also planned to arrange workshops and trainings for customs personnel and persons involved in measurement activities in the field of environmental protection, analytical (laboratory) control in the field of environmental protection, refrigerator maintenance and repairs. In addition, a number of awareness-raising events will be conducted to familiarize their participants with requirements imposed by laws and regulations, including technical laws and regulations governing the rules (procedure) of import control, HCFC end use regulation, customs control, prevention of illegal ODS trade and incorrect marking.

Apart from that, there are plans to organize (on an ongoing basis) the training and retraining of customs personnel directly involved in customs clearance of goods at border checkpoints. Training programs for customs personnel and persons involved in measurement activities in the field of environmental protection and analytical (laboratory) control in the field of environmental protection will be included into the academic programs of vocational schools and universities (Belarusian National Technical University, Mogilev State University of Food, Polotsk Commerce and Technology College, and Pinsk State Agrarian Technological College).

Funds provided to vocational schools and universities under international technical aid projects will be used to purchase modern training equipment sets as well as sets of standard tools and devices designed to hone practical skills in equipment maintenance and repairs.

Funds provided to customs bodies and laboratories involved in measurement activities in the field of environmental protection and analytical (laboratory) control in the field of environmental protection under international technical aid projects will be used to purchase portable devices designed to detect and analyze the whole range of ODSs and HFCs that will help identify HCFCs among other imported chemical substances as well as HCFC and HFC-containing equipment/products. It is planned to prepare practical instructions for marking and labeling of regulated ODSs and information exchange procedures.

Another measure to be taken is to adapt the European standards (regulations) for present-day practice of managing the existing HCFC data bank when servicing equipment with a residual useful life to minimize the use of new refrigerants. This will help reduce leaks, improve the recovery and reuse of refrigerants and simplify the recycling or reclamation of ozone depleting substances. It will also facilitate power saving activities. The above measures will require highly qualified technicians trained to operate modern equipment and instruments. The country has suitable basis for training and retraining of refrigeration equipment maintenance and repair personnel. However, this system must be enhanced with simultaneous simplification of equipment certification requirements and enable access of experts to tutorials in modern technologies and materials. Training manuals for instructors covering such topics as regulation enforcement, customs control, expansion of licensing measures and integration of HCFC phase out activities, addressing energy efficiency issues and reducing greenhouse gas emissions will be translated into Russian.

There is a need to arrange regular consultations with stakeholders and potential users of information products related to the launch of legislative and investment activity as part of the program for retrofitting/replacement of equipment and introduction of alternative highly energy efficient technologies with a low global warming potential. Additional measures will be taken to raise the awareness about the ban on imports of HCFC-containing equipment, about the introduction of technologies (systems) designed for reclamation, recycling and recovery of ozone depleting substances and about implementation of technologies based on HCFC alternatives taking into account the minimization of impact of such alternative substances on the climate change.

***Complete HCFC phase out in the production sector:*** On needs to conduct measures to retrofit the HCFC-based production processes by introducing non-ODS technologies primarily for the following purposes:

for processes using HCFC-141b as a solvent for cleaning manufacturing equipment and component parts when manufacturing compressors for refrigeration equipment, which results in total HCFC-141b annual consumption of 7 МТ;

for processes using HCFC-141b as a blowing agent in polyolic compositions where some 56 МТ HCFC-141b are annually used during foam materials manufacturing.

Demonstrations of alternative technologies (HFC, ammonia, retrofitting/replacement of equipment) in various sectors, e.g., milk refrigeration equipment, will help lower the barriers for adoption of such technologies on the national level (efficiency, retrofitting costs, etc.) and facilitate energy saving, which will fuel the interest in alternative technologies and serve as a stimulus for massive conversion to new technologies in future when HCFC imports will be restricted. Demonstrations must be conducted at least at five enterprises subordinate to the Ministry of Agriculture and Food that use milk-cooling systems. This primarily concerns Vitebsk, Gomel and Mogilev Regions where some 16 МТ of HCFC-22 are annually consumed.

A concept of measures to incentivize industrial and commercial refrigeration equipment owners will be developed. The concept will include two key areas:

promoting the use of low global warming potential technologies in the country thus ensuring high energy efficiency at new facilities or at the existing HCFC-based facilities. The main priority will be awarded to the use of natural refrigerants featuring high efficiency and low global warming potential, and namely CO2, hydrocarbons, ammonia or cyclopentane (depending on the applicability of this or that technology in the existing production processes);

encouraging retrofitting/replacement of CFC-based equipment converted to HCFC which will lead to accelerated replacement of inefficient equipment that could have remained operational for quite a long time. Preference is given to technology options with a low global warming potential and ability to use non-ODS refrigerants.

***Creating and improving the refrigerants (HCFC) management (handling) system:*** This component is related to introduction of modern technical requirements and possibilities designed to improve the quality of refrigeration equipment maintenance. Quality refrigerant management will ultimately reduce the need for HCFCs through reclamation, recycling and recovery of ozone depleting substances as well as through destruction of unusable refrigerants. Implementation of three lines of activity described below is based on the assumption that the development of the proposed HCFC-focused refrigerant management system will cover the HFCs and also help with their recovery, leak minimization and reclamation in a bid to cut greenhouse gas emissions into the atmospheric air:

*improving refrigerant recovery and recycling practices:*  provision of qualified technical personnel with state-of-the-art equipment for reclamation, recycling and recovery of ozone depleting substances along with appropriate leak-detecting tools and equipment, application of best HCFC management practices and stimulation of collection and reuse of refrigerants will allow reducing the need to purchase new refrigerants and help cut harmful emissions into the atmosphere; strengthening of four currently operating service centers for reclamation and recycling (R&R) as well as creation of a new center for regeneration (recovery), storage and destruction of ozone depleting substances (R/R/R);

*upgrading the refrigerant distribution infrastructure:*  The EU experience suggests that compliance with the requirement for import of refrigerants in returnable containers and their subsequent use during technical maintenance and repair of equipment yields substantial benefits. This simplifies control over imports and reduces atmospheric emissions. It also helps avoid residual refrigerant loss in disposable containers and brings down foreign currency expenditure by increasing the domestic content in the added value;

*creating facilities for destruction of unusable refrigerants:* facilities designed for extraction and safe storage of refrigerants that can no longer be used, that have been extracted from dismantled equipment or have no practical use as well as refrigerants that need to be destroyed. Implementation of the above activities requires development and introduction of relevant measures to launch the economic mechanism of collection, storage and reclamation of freons. Development of facilities capable of environmentally friendly disposal of unusable ODSs must be well prepared because the implementation of this measure may be associated with significant costs for the country. This activity has a potential to attract investments through the carbon finance mechanism.

***Developing measures to reduce the use of ozone depleting substances for one's own needs:*** Licenses for activities affecting the environment through ODS consumption issued (extended) to economic agents (owners of HCFC-containing equipment) before January 1, 2014 must set special requirements and conditions for approval and arrangement of events aimed at reduction of ODS consumption by 50%[[5]](#footnote-5) to the corresponding year, whereas license issued (extended) between January 1, 2014 and January 1, 2020 must set [[6]](#footnote-6) special requirements and conditions for approval and arrangement of events aimed at reduction of ODS consumption by 70%[[7]](#footnote-7) to the corresponding year 6 with indication of the need to use only reclaimed HCFCs after January 1, 2020.

***Reducing the use of ozone depleting substances during technical maintenance and repairs:*** Prior to January 1, 2014, when deciding to issue (extend) [[8]](#footnote-8) licenses for activities affecting the environment through ODS consumption to economic agents involved in technical maintenance and repair of HCFC-containing equipment, one must indicate the need to reduce the permitted amount of ODSs by at least 50%5 of the permitted ODS amount[[9]](#footnote-9) specified in the previous license; between January 1, 2014 and January 1, 2020, when deciding to issue (extend)8 licenses, one must indicate the need to reduce the permitted amount of ODSs by at least 70%7 of the permitted ODS amount9 specified in the previous license.

Annex

to the HCFC Phase Out Strategy of the Republic of Belarus until 2020

Compliance targets for HCFC reduction obligations undertaken by the Republic of Belarus

Compliance targets for HCFC reduction obligations undertaken by the Republic of Belarus

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year  | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| HCFC-141b | 7.330 | 7.160 | 2.387 | 0.796 | 0.265 | 0.072 | 0 | 0 | 0 | 0 | 0 |
| Polyols | 56.100 | 25.900 | 5.180 | 0.518 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HCFC-22 | 138.780 | 123.067 | 102.556 | 85.463 | 71.219 | 61.534 | 30.767 | 10.256 | 2.564 | 0.513 | 0.085 |
| HCFC-142b | 21.813 | 20.416 | 6.805 | 2.268 | 0.756 | 0.204 | 0 | 0 | 0 | 0 | 0 |
| HCFC-21 | 3.635 | 3.403 | 1.134 | 0.378 | 0.126 | 0.034 | 0 | 0 | 0 | 0 | 0 |
| Total, МТ | 227.658 | 179.946 | 118.062 | 89.423 | 72.367 | 61.844 | 30.767 | 10.256 | 2.564 | 0.513 | 0.085 |
| Total, МТ ODP | 10.546 | 9.233 | 6.424 | 4.948 | 3.998 | 3.406 | 1.692 | 0.564 | 0.141 | 0.028 | 0.005 |
| Baseline consumption level (BCL), МТ ODP | 12.729 | 12.729 | 12.729 | 12.729 | 12.729 | 5.092 | 5.092 | 5.092 | 5.092 | 5.092 | 0.005 |
| Deviation from the BCL, % | -17.1 | -27.5 | -49.5 | -61.1 | -68.6 | -33.1 | -66.8 | -88.9 | -97.2 | -99.4 | -6.0 |

**Compliance targets for each substance, metric tons**

HCFC-21

HCFC-142b

HCFC-22

Polyols

HCFC-141b

**Compliance targets for all substances, metric tons (taking into account the ozone depleting ability)**

Actual substance consumption level, MT ODP

Basic consumption level (BCL), MT ODP

1. The expected baseline consumption level (BCLi) is calculated for each Montreal Protocol Signatory as a sum of products of substances (measured in metric tons) produced and imported by a Signatory in 1989 by the of ozone depleting capacity of these substances using the formula below:
BCLBelarus =Σ ECL1989(Annex С Group 1) + 3.1%Σ ECL1989(Annex А Group 1) = 0.055 \* 54.5t
(R22) +0.065 \* 0.71t (R142) + 0.031\* Σ (1\* ((653t(R11) +718t (R12) + 11.7t(R114)) +0.8\* 202t (R113)) =
2.998 + 0.046 +0.031\*1544.3 = 50.917 [↑](#footnote-ref-1)
2. By consumption level in the reporting year we mean the total amount of ozone depleting substances produced in the Republic of Belarus and imported from other countries with the exception of ozone depleting substances exported to other countries as well as imported or exported reclaimed, recycled and recovered ozone depleting substances calculated on the basis of reports submitted by economic agents for the reporting year [↑](#footnote-ref-2)
3. as part of CFC-12 mixture substitutes [↑](#footnote-ref-3)
4. excluding the use in polyolic compositions; in 2009, 25.8 МТ were used as polyols, 56.1 МТ in 2010, and 25.9 МТ in 2011. [↑](#footnote-ref-4)
5. The ODS use reduction ratio has been calculated using the formula 10.002-10.002\*49.09%=5.092, which means that minimum reduction of 49.09% will provide the required consumption level of 5,092 МТ ODP. With this in mind the ODS use reduction for economic agents (owners of HCFC-containing equipment) was set at 50 percent [↑](#footnote-ref-5)
6. Given that licenses are issued for a period of 5 years, before January 1, 2014 when issuing licenses to economic agents (owners of HCFC-containing equipment) the deadline for completion of ODS reduction activities must be January 1, 2018; between January 1, 2014 and January 1, 2015 the deadline must be January 1, 2019; and between January 1, 2015 and January 1, 2016 the deadline must be January 1, 2020. After that, starting from January 1, 2020 and later, one should indicate the need to use only recycled and reclaimed ODSs [↑](#footnote-ref-6)
7. The ODS use reduction ratio has been calculated using the formula (5.092-5.092\*70%)-1.518\*99.5%=0.005, which means that minimum reduction of 70% and maximum increase in the use of reclaimed, recycled and recovered ODSs up to 99.5% will provide the required consumption level of 0.005 МТ ODP. With this in mind the ODS use reduction for economic agents (owners of HCFC-containing equipment) was set at 70 percent [↑](#footnote-ref-7)
8. Licenses must be issued taking into account the provisions of the Strategy's subsection titled "Imposing restrictions in the regulation of HCFC consumption"; licenses must be extended taking into account the observance of restrictions on ODS consumption specified in such licenses [↑](#footnote-ref-8)
9. Given that licenses are issued for a period of 5 years, before January 1, 2014, when issuing licenses to economic agents involved in technical maintenance and repair of HCFC-containing equipment, the deadline for reduction of ODS consumption must be January 1, 2018; between January 1, 2014 and January 1, 2015 the deadline must be January 1, 2019; and between January 1, 2015 and January 1, 2016 the deadline must be January 1, 2020. After that, starting from January 1, 2020 and later, one should indicate the need to use only reclaimed, recycled and recovered ODSs [↑](#footnote-ref-9)