

Report

main activities of Ozone Center of Kyrgyzstan in 2019 on realization of HCFC phase out management plan (phase II) in the Kyrgyz Republic for 2015-2020

The program on phase-out of ozone depleting substances for 2016-2020 (Phase 2) is aimed at meeting the requirements of the Montreal Protocol on Substances, that Deplete the Ozone Layer. The Kyrgyz Republic is a party of the Protocol in accordance with the Law of the Kyrgyz Republic "On the Ratification of the Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol on Substances, that Deplete the Ozone Layer". The program provides complete phase out of consumption (production, export and import) of all ozone depleting substances (ODS) in the territory of the Kyrgyz Republic by 2020. The program includes the following activities:

Action Plan for realization of the Program

No	Actions	Schedule	Responsible actors
1.	Improvement of the legal and regulatory framework for ODS control	2016-2020	State Inspectorate for Environmental and Technical Safety (SIETS) State Agency on Environment Protection and Forestry (SAEPF)
2.	Raising public awareness	Constantly	Ministry of Education and Science (MES), Ministry of Health (MH), SAEPF
3.	Monitoring of ODS handling	2016-2020	SAEPF
4.	Training of representatives of authorized state bodies (customs and border services, financial police and ecological and technical inspectorate)	2016-2020	SAEPF, State Custom Service (SCS), State Border Service (SBS), State Service Against Economic Crimes (SSAEC), State Inspectorate for Environmental and Technical Safety (SIETS)
5.	Training and certification of technicians on maintenance of refrigeration equipment	2016-2020	SIETS, MES, SAEPF
6.	Training of students from universities and educational organizations of secondary and primary education to prepare specialists for refrigeration and treatment industries	2016-2020	MES
7.	Recovery and recycling of refrigerants	2016-2020	SIETS, SAEPF
8.	Support local industrial sector in reducing the use of HCFCs	2016-2020	SIETS, SAEPF

9.	Regular reporting on the management of ODS to the Secretariat of the Montreal Protocol, the Multilateral Fund for the Montreal Protocol, UNEP, UNDP	Annually	SAEPF
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Improvement of the legal and regulatory framework for ODS control

In May 2019, the draft decree “On Amendments and Additions to the Decree of the Government of the Kyrgyz Republic of September 19, 2009 N 594 “On the Approval of Provision on State Regulation of Import and Export of Ozone-Depleting Substances and Products Containing Them” was developed and submitted for consideration to the Government of the Kyrgyz Republic.

In October 2019, a package of normative legal acts “Safety Rules for Ammonia Refrigeration Units and Systems” and the draft Provision of the Government of the Kyrgyz Republic were developed, and sent for consideration to the State Committee for Industry, Energy and Subsoil Use of the Kyrgyz Republic.

On November 13, 2019, the Jogorku Kenesh of the Kyrgyz Republic adopted the law “On the ratification of protocol on accession of the Kyrgyz Republic to this agreement on movement of ozone-depleting substances and products containing them, and accounting of ozone-depleting substances when implementing mutual trade between Eurasian Economic Union Member States from May 29, 2015, signed on August 12, 2016 in the Sochi city”.

On December 3, 2019, the draft Decree of the government of Kyrgyz Republic “On ratification of the amendment to the Montreal Protocol on substances that deplete the ozone layer adopted in the city of Kigali, Republic of Rwanda on October 15, 2016” was adopted, Decree of the government of Kyrgyz Republic No November 2019.

In August 2019, the Ozone Center developed a report on the consumption of HFCs and ODS in Kyrgyzstan for period of 2001-2018 for the Fourth National Communication for the implementation of the obligations under the United Nations Framework Convention for Climate Change (UNFCCC).

During the reporting period, following materials were printed and distributed:

1. Manual on energy efficiency of refrigeration equipment, air conditioners and heat pumps– 200 copies
2. Brochure “Ratification of the Kigali Amendment. Information note” - 100 copies in Russian and Kyrgyz languages
3. Fact sheet “Amendments to the Montreal Protocol on Substances, that Deplete the Ozone Layer Decision XXVIII/1: Additional amendments to the Montreal Protocol» - 100 copies in Russian language
4. Fact sheet “Amendments to the Montreal Protocol on Substances, that Deplete the Ozone Layer Decision XXVIII/1: Additional amendments to the Montreal Protocol» - 100 copies in Kyrgyz language
5. Information note to the draft Law of the Kyrgyz Republic “On ratification of the Kigali Amendment to the Montreal Protocol” -100 copies in Russian language
6. Information note to the draft Law of the Kyrgyz Republic “On ratification of the Kigali Amendment to the Montreal Protocol” -100 copies in Kyrgyz language

7. List of ozone-safe HFC substances and their mixtures with relevant national customs codes
8. Guide Green refrigeration technologies on CO2 - 100 copies
9. Brochure Safe Use of HFC Alternatives – 200 copies
10. Brochure Real HFC Alternatives – 100 copies
11. Poster “Appropriate Dismantling of Air Conditioners” - 50 copies
12. Poster “Appropriate Dismantling of refrigerators” - 50 copies
13. Poster “Code of Practices for RAC System Servicing” - 50 copies

Training and certification of technicians on maintenance of refrigeration equipment

During the reporting period 9 workshops was conducted for experts of refrigeration sector in the framework of the implementation of HCFC Phase Out Management Plan (HPMP).

No.	Place	Date	Number of participants
1.	Bishkek, Chuy oblast	30 th of March 2019	28
2.	Bulan-Sogottu village, Issyk-Kul oblast	18-19 th of April 2019	42
3.	Osh, Osh oblast	21 st of May 2019	28
4.	Bishkek, Chuy oblast	23 rd of July 2019	24
5.	Bishkek, Chuy oblast	7 th of September 2019	21
6.	Bishkek, Chuy oblast	18 th of September 2019	46
7.	Cholpon-Ata, Issyk-Kul oblast	9 th of October 2019	30
8.	Osh, Osh oblast	24 th of October 2019	29
9.	Osh, Osh oblast	28 th of November 2019	35

On March 30, 2019, a training workshop on refrigerant recovery and recycling and best practices for safe maintenance of refrigeration equipment in the Kyrgyz Republic. The following topics were discussed at the workshop: Montreal Protocol on substances that deplete the ozone layer. The Kigali Amendment to the Montreal Protocol and energy efficiency issues in the RAC&HP sector. Climate change and the Kigali Amendment. Certification system for experts and organizations working at refrigeration and air conditioning sector were presented and discussed. Refrigerant recovery and recycling methods, tools and equipment for maintenance and repair of RAC, safe handling of HCFC/HFC refrigerants, good practices of servicing RAC were presented. How to handle contaminated refrigerant and use digital refrigerant analyzer; Maintenance of the vacuum pump and charging station; Maintenance of refrigerant recovery and recycling machines, the economic benefits of refrigerant recovery and best service practices were presented during the workshop. During practical session, participants learnt how to use modern recovery machine to recover refrigerant in liquid and gas phases. 11 refrigerant recovery and recycling machines were distributed among organizations and private entrepreneurs who are engaged in service, repair and installation of refrigeration and air-conditioning equipment.

On April 18-19, 2019, in Bulan-Sogottu village, a workshop on the recovery and recycling of refrigerants and best practices for the safe maintenance of refrigeration equipment in the Kyrgyz Republic was held. The following topics were addressed at this workshop: The Kigali Amendment

to the Montreal Protocol and energy efficiency in RAC; Climate change problem and its effects to the Environment of Kyrgyzstan; Certification of Experts and Organizations of RAC sector; Tools and equipment for maintenance and repair of RAC equipment. How to determine contamination level with digital refrigerant analyzer, Work and maintenance of refrigerant recovery and recycling machines. Energy efficiency of hydrocarbons as refrigerants in commercial RAC sector, examples of successful introduction of natural refrigerants. Alternative technologies for HCFC and HFC. Application of green technologies in refrigeration equipment and air conditioners sectors; Retrofit of existing systems for alternative low-GWP refrigerants; Requirements and specifics of Interstate Standard EN 378 Refrigerating systems and heat pumps. Safety and environmental requirements its features and requirements.

Practical session included working with refrigerant recovery machines, participants learnt how to operate and make connection to the RAC system and cylinders and recovery of refrigerant in its gas and liquid phases. Second practical session included determining a type of refrigerant using a digital refrigerant analyzer. At the workshop, organizations from different regions were given refrigerant recovery machines and sets of special equipment for refrigeration technicians.

On May 21, 2019 in Osh, a training workshop on the recovery and recycling of refrigerants and best practices for maintenance of refrigeration equipment in the Kyrgyz Republic was held. The following topics were covered at the workshop: The state program on phasing out of ODS in the Kyrgyz Republic for the period of 2016–2020. The legislation of Customs Union Countries on regulation of ODS was presented and it was told what changes have occurred in the legislation and what changes are foreseen in the import and export of ODS and ODS containing products. Global climate change and its effects and how the Kigali Amendment can help in fighting with the climate change. Certification system of experts and organizations of refrigeration sector - the basic rules and requirements were discussed. Refrigerant recovery and recycling methods were described in detail. The workshop participants learned about safe working practices when servicing RAC systems and safe handling of HCFC/HFC refrigerants, maintenance of a vacuum pump and refrigerant recovery machine and cost-benefits of refrigerant recovery and reuse.

At the practical class, participants learnt how to use modern refrigerant recovery machines to recover refrigerants in liquid and gas phases. There was a demonstration of how to connect the recovery machine to the RAC system using different schemes and then participant repeated the schemes. At the workshop, Ozone Center distributed modern refrigerant recovery machines to organizations that serve, install and repair RAC systems in the southern regions of Kyrgyzstan. 29 people attended the workshop.

On July 23, 2019, in Bishkek, a workshop for specialists in ammonia refrigeration units on the topic “Introduction of natural refrigerants and the best practices for servicing ammonia refrigeration equipment in the Kyrgyz Republic” was held. An engineer from Mayekawa/Mycom Dmitry Krasov, Russia, was invited to the workshop. He spoke about modern ammonia industrial and commercial equipment produced by the company, and their technical features, energy efficiency and COP. Detailed information about alternative natural refrigerants, their safety, effectiveness and examples of best practices was given. Participants learned in detail about the end-user incentive program for the commercial and industrial refrigeration sector and were encouraged to apply. 24 people attended the workshop.

On September 7, 2019 in Bishkek, a training workshop was held on the recovery and recycling of refrigerants and best practices of maintenance of refrigeration equipment in the Kyrgyz Republic. The following topics were discussed at the workshop: State program of the Kyrgyz Republic on phase out of ODS 2016-2020; the legislation of the Customs Union on control of ODS and what changes to expect in the legislation import and export of ODS and ODS-containing products. Global climate change and its implications and how the Kigali amendment can contribute to combat the climate change; Certification of specialists and enterprises of refrigeration equipment; Refrigerants recovery methods were explained; Safe handling of HCFC/HFC refrigerants; Maintenance of the vacuum pump and machine for the recovery and recycling of refrigerants; Cost-effective recovery of refrigerants and reuse. At a practical lesson, machine for the recovery and recycling of refrigerants was taught, how it connects to cylinders and the system. At the workshop, contracts were signed between the Ozone Center and organizations for the transfer of equipment and conditions were agreed. The workshop was attended by 21 people.

On September 18, 2019 in Bishkek, the workshop "Implementation of alternatives to HCFCs and new technologies in the refrigeration sector of Kyrgyzstan" was held, there were 46 participants. The following topics were discussed at the workshop: The protective role of stratospheric ozone; Changes in the legislation of the Kyrgyz Republic on protection of the ozone layer in connection with entry into the Customs Union and expected Ratification of the Kigali Amendment; The minimum requirements for a certification of refrigeration technicians and organizations; Interstate standard "Refrigerating systems and heat pumps. Safety and environmental requirements."; Overview of the main areas of HFCs use; Domestic refrigeration equipment; Commercial refrigeration equipment; Industrial refrigeration equipment; Mobile refrigeration systems; Independent low-capacity air conditioning equipment. A practical lesson on the methods of recovery, recharge and recycling of refrigerants using a modern recovery machine was held.

On October 9, 2019, in Cholpon-Ata, a training workshop was held on the recovery and recycling of refrigerants and best practices for the safe maintenance of refrigeration equipment in the Kyrgyz Republic. The following topics were discussed at the workshop: Montreal Protocol on Substances that Deplete the Ozone Layer. The Kigali Amendment to the Montreal Protocol and energy efficiency issues in the RAC&HP sector and described what changes are expected in the import and export of ODS and ODS-containing products. Other topics of the workshop: Global climate change and its implications and how the Kigali amendment can contribute to combat the climate change; Climate-friendly refrigerants with low global warming potential (GWP) in refrigeration and air conditioning; Methods for the recovery and recycling of refrigerants; Refrigerant recovery economics and service best practices; Safe handling of HCFC/HFC refrigerants; Maintenance of the vacuum pump and the machine for the recovery and recycling of refrigerants. A practical lesson was held where the participants learned how to use a machine for recovery and recycling refrigerants. Then participants practiced in using the machine under the supervision of lecturer. 30 technicians attended the workshop.

On October 24, 2019 in Osh city, a training workshop on the recovery and recycling of refrigerants and best practices for the safe maintenance of refrigeration equipment in the Kyrgyz Republic was held. The following topics were discussed at the workshop: the Kigali Amendment and energy efficiency of RAC&HP. The lecturer told about changes in the legislation and what

changes are expected in the import and export of ODS and ODS products in 2020. Other topics discussed at the workshop are: Climate change and its implications for the world and Kyrgyzstan, How Kigali Amendment can help combat global warming. It was described in detail about the characteristics of modern and climate-friendly refrigerants with a low global warming potential (GWP), Methods for the recovery and recycling of refrigerants, Economics of refrigerant recovery. The maintenance of vacuum pump and the machine for the recovery and recycling of refrigerants, tools for the maintenance and repair of RAC were explained. A practical lesson was held where the workshop participants learned how to use a machine for recycling and recovery refrigerants in the liquid and gas phase. The participants practiced in use of the machine. 29 technicians took part at the workshop.

On November 28, 2019, in Osh city, a training workshop was held on the introduction of natural refrigerants and best practices for the safe maintenance of refrigeration equipment in the Kyrgyz Republic. The following topics were discussed at the workshop: The protective role of stratospheric ozone and the environmental impact of refrigerants and dangers and benefits of UV radiation. HCFC alternatives and their main features were described; Kigali Amendment to the Montreal Protocol, climate change and RAC Sector; State records of ODS consumption in the country and how to keep a log-book of refrigerants. The interstate standard EN 378 and certification of specialists and enterprises of the country's refrigeration industry was discussed. The methods for recovery and recycling of refrigerants have been explained in detail; It was told in detail about the handling of HCFC and HFC refrigerants and hydrocarbon refrigerants and the specifics of servicing air conditioners on HCFCs, HFCs and hydrocarbons. A practical lesson was held where the workshop participants learned how to use a machine for recycling and recovery of refrigerants from systems. It was shown how the equipment for pumping is connected to cylinders and the system. 29 technicians took part at the workshop.

Workshops for end-users

In 2019, 5 workshops were held for owners of retail stores, hotels and other organizations using refrigeration equipment, with the aim of giving them information about the possibility of introducing new equipment working on natural refrigerants, instead of on HCFCs. For these projects, 36 refrigeration units operating on propane were purchased. At the moment, negotiations with end users are underway and the terms of the contract are discussed. List of workshops held:

No.	Place	Date	Number of participants
1.	Bishkek, Chuy oblast	9 th of April 2019	25
2.	Osh, Osh oblast	22 nd of May 2019	19
3.	Cholpon-Ata, Issy-Kul oblast	10 th of October 2019	32
4.	Jalalabad, Jalalabad oblast	22 nd of October 2019	29
5.	Osh, Osh oblast	25 th of October 2019	32

On April 9, 2019, in Bishkek a workshop on “Stimulating of end users to introduce natural refrigerants in the commercial refrigeration sector of the Kyrgyz Republic” was held. The workshop covered such topics as the Montreal Protocol on Substances that Deplete the Ozone Layer and Energy Efficiency Issues in the RAC Sector. Climate change and the Kigali Amendment, Climate-friendly refrigerants with low global warming potential (GWP) in

refrigeration and air conditioning sectors, Energy efficiency of HC as refrigerants in commercial refrigerators. Examples of successful use of HC as a refrigerant. The program for stimulation of end-user of the commercial and industrial cooling equipment sector; Safe handling of HC refrigerants and good practices when servicing RAC systems. Comparing the parameters of the cooling cycle and the characteristics of propane with R-22; Certification system for specialists and refrigeration equipment enterprises. During the workshop the demonstration of the chiller on R290 (propane) and refrigerators of a grocery store operating on R290 (propane) were conducted.

On May 22, 2019, in Osh, a workshop on “Stimulating of end users to introduce natural refrigerants in the commercial refrigeration sector of the Kyrgyz Republic” was held. The workshop covered such topics as the Montreal Protocol on Substances that Deplete the Ozone Layer and Energy Efficiency Issues in RAC Sector, the main goals of the Montreal Protocol and the Kigali Amendment, how to replace equipment with more energy efficient and running on natural refrigerants. Participants learnt about modern and climate-friendly refrigerants with low global warming potential (GWP) in refrigeration and air conditioning sector and successful projects on introduction of natural refrigerants. It was described in detail the benefits of the transition to green cooling technology for trade organizations. The end-user stimulation program for the commercial cooling equipment sector was introduced and requirements and eligibility for application were discussed with the participants. Comparisons of propane and R22 in cooling cycle and their performance characteristics were made and operating pros and cons of commercial refrigerators on R290 (propane) and CO₂ were described; 29 people participated the workshop.

On October 10, 2019, in Cholpon-Ata city, a seminar “Stimulation of end users on the introduction of natural refrigerants in the sector of commercial refrigeration equipment of the Kyrgyz Republic” was held. The seminar covered topics such as the Montreal Protocol on Substances that Deplete the Ozone Layer and energy efficiency issues in RAC&HP sector⁶ Main objectives of the Montreal Protocol and the Kigali Amendment were discussed. How it is possible to replace old equipment on HCFC with more energy-efficient and working on natural refrigerants in the framework of the project was explained; Other topics covered within the workshop: Modern refrigerants with low global warming potential (GWP) in refrigeration and air conditioning; Energy efficiency of hydrocarbons as refrigerants. The speaker spoke in detail about the benefits of switching to green refrigeration technology for trade companies and gave information of implemented projects. The program for stimulating the end users of the sector of commercial cooling equipment was described in detail. It was explained what equipment will be considered for replacement and how to fill in application form. 32 participants attended the workshop.

On October 22, 2019, in the city of Jalalabad, a seminar “Stimulation of end users on the introduction of natural refrigerants in the sector of commercial refrigeration of the Kyrgyz Republic” was organized and conducted. The following topics were discussed at the seminar: Kigali Amendment to the Montreal Protocol and energy efficiency issues in RAC sector. Aims of Montreal Protocol and Kigali Amendment; An opportunity to replace obsolete equipment with more energy efficient and working on propane; It was described in detail about modern refrigerants with low global warming potential, used in refrigeration and air conditioning and use of hydrocarbons as refrigerants. The speaker spoke in detail about the benefits of switching to green refrigeration technology for commercial companies and presented implemented projects in other countries. The program for stimulating end users in the sector of commercial and industrial refrigeration was described in detail. The workshop was attended by 29 participants.

On October 25, 2019, in Osh city, a seminar “Stimulation of end users on the introduction of natural refrigerants in the sector of commercial refrigeration of the Kyrgyz Republic” was held. The following topics were discussed at the seminar: Montreal Protocol on Substances that Deplete the Ozone Layer. The presentation described the purpose of the Montreal Protocol and the Kigali Amendment. It was described about modern refrigerants, their indicators of global warming potential, properties and characteristics when used in refrigeration equipment and air conditioners; the use of hydrocarbons and CO₂ as refrigerants. The speaker spoke in detail about the benefits of switching to modern refrigeration technology and gave examples of successful projects. It was described in detail about the program for stimulating end users in the sector of commercial refrigeration. The information on what equipment will be considered for replacement and how to apply was given. 32 participants attended the seminar.

Conducting workshops on building energy efficiency for architects and designers

During the reporting period, 2 training workshops for architects and designers were held as part of the implementation of the HCFC phase-out management plan (HPMP).

No.	Place	Date	Number of participants
1	Osh	29 th of October 2019	63
2	Bishkek	31 st of October 2019	55

On October 29, 2019 in Osh and on October 31, 2019 in Bishkek, a workshop “Innovations for energy-efficient buildings: modern practices abroad and in Kyrgyzstan” was held. The following topics were covered at the workshop: Legislation of Kyrgyzstan in the field of regulation of energy efficiency in buildings: energy certification of buildings; Energy Efficiency in RAC sector and the Kigali Amendment to the Montreal Protocol; Comprehensive assessment of energy efficiency at construction sites. Energy-saving and passive houses; Solutions for buildings: green roofs and facades, photovoltaic panels on the roof. Swiss green building experience; Use of solar panels for power supply and solar collectors for heat and domestic hot water supply; Design of engineering systems in energy-efficient buildings. Presentations about construction of energy-efficient buildings in Kyrgyzstan were made. Foreign experts Anatoly Necheporchuk, Ph.D., leading expert on energy efficiency, member of the Association of Experts in the Construction Industry, Sedak Denis, certified architect, city planner, chief project architect, member of the National Union of Architects of Ukraine and Alexey Pilipenko, Ph.D., Associate Professor, National University of Food Technologies, Ukraine, were invited to the workshop. Andreas Dreisiebner, Solar Spar Association, Member of the Board of Directors, Project Manager and Max Roth, Research Engineer, Switzerland were invited to the workshop. 63 participants from south and 55 participants from north regions of the country attended the workshops. Based on the results of the workshop, an appeal to the Government of the Kyrgyz Republic was developed. It aims to facilitate the further implementation of the Law of the Kyrgyz Republic "On the energy efficiency in buildings."

Training of representatives of authorized state bodies (customs and border services, financial police and ecological and technical inspectorate)

In the **period from 1st of January to 31st of December 2019**, seven workshops on regulation of import/export/transit of ODS and ODS-containing equipment and on compliance with the provisions of international environmental conventions in the Kyrgyz Republic within the framework of HPMP project (HCFC Phase-Out Management Plan) and the State program for ODS phase-out in the Kyrgyz Republic for officers of authorized state bodies.

No.	Place	Date	Number of participants
1	Leninskoe village, Chuy oblast	25 th of January 2019	38
2	Osh, Osh oblast	29 th of January 2019	40
3	Bishkek, Chuy oblast	28 th of February 2019	35
4	Naryn, Naryn oblast	3 rd of May 2019	33
5	Novopokrovka village, Chuy oblast	12 th of November 2019	31
6	Bulan-Sogottu village, Issyj-k-Kul village	22 nd of November 2019	31
7	Osh, Osh oblast	29 th of November 2019	33

On January 25, 2019, in the village of Leninskoye, NOU officers conducted a training workshop on the regulation of the import/export/transit of ODS (ozone-depleting substances) and ODS containing equipment for customs officers. The following topics were included in the workshop agenda: The protective role of stratospheric ozone; International agreements and national legislation in the field of ozone layer protection and changes in the legislation of the Kyrgyz Republic in ozone layer protection in connection with entry into the Customs Union. New Code of the Kyrgyz Republic; State program to phase out the use of ODS in the Kyrgyz Republic; Identification of ODS and equipment containing ODS; General trade names for ODS and mixtures containing ODS; Labelling, CAS/ASHRAE/UN numbers, and color-codes, etc.; Cases of ODS smuggling in Kyrgyzstan. 38 custom officers attended the workshop. Manuals on ODS for customs and law enforcement officers were distributed to all workshop participants. Also during the workshop, a practical lesson on the use of a refrigerant identifier (gas analyzer) to determine the type of refrigerant was held and safety rules when handling refrigerants and pressure vessels was explained.

On January 29 2019, in Osh, a training workshop on the regulation of the import/export/transit of ODS and ODS containing equipment for customs officers was held. The workshop addressed the following topics: The role of ozone layer for health of human and other species and ozone depletion problem; Introduction to Ozone depleting substances; International agreements and national legislation in the field of the preservation of the ozone layer and changes in the legislation due to Kyrgyzstan's entry into the Customs Union. New Code of the Kyrgyz Republic, The state program on phasing out of ODS in the Kyrgyz Republic, its schedules and activities. Determination of ODS and equipment containing ODS, Common trade names for ODS and its blends, ODS detection methods; Labelling, CAS/ASHRAE/UN numbers, sample labels for ODS and color codes, etc. Cases of smuggling of ODS in Kyrgyzstan. 40 customs officers

participated in the workshop. All participants were given special manuals on ODS for customs and law enforcement officers. The workshop included a practical lesson, during which participants learnt how to use a refrigerant identifier (gas analyzer) to determine the type of refrigerant and learnt how to safely handle refrigerants and vessels under the pressure.

On February 28, 2019, State Agency on Environmental Protection and Forestry and ozone Center of Kyrgyzstan organized joint workshop on Implementation of State Environmental Control in Compliance with the Provisions of International Environmental Conventions in the Kyrgyz Republic for inspectors of State Inspectorate on Environmental and Technical Safety. There were 35 participants. They are state environmental inspectors from Bishkek and Talas cities and other regions of Talas and Chuy oblasts. It was told about functions of inspectors in controlling of consumption and prevention of ODS emissions, providing verification on certificates of refrigeration technicians and legal entities of refrigeration industry. The role and functions of inspectors in implementing Stockholm, Basel, Rotterdam and CITES conventions was discussed. Legislative frameworks for implementation of conventions were presented. The workshop included a practical session, where participants were trained how to use a digital gas analyzer to determine refrigerants type, learnt about safe handling and storing of refrigerants and which personal protective equipment should be used when handling refrigerants.

On May 3, 2019, in Naryn, a training workshop on the regulation of the import/export/transit of ODS and ODS containing equipment for customs officers of the Naryn region was held. The workshop described in detail the role of stratospheric ozone in protecting against UV radiation and the effect of UV radiation on human health. The Montreal Protocol and the regulation of ODS and national legislation in protection of the ozone layer and changes in this legislation in connection with the entry into the Customs Union were described. It was told about the State Program on phasing out of ODS in the Kyrgyz Republic and the schedule for reducing the consumption of HCFCs and other ODS. Customs officers learnt in detail the definition of ODS and equipment containing ODS, trade names of ODS and their blends, labeling, CAS/ASHRAE/UN codes and color codes. They learnt about ODS smuggling methods and methods for detecting incorrectly labeled containers, cases of ODS smuggling in Kyrgyzstan. 33 officers attended the workshop. All participants of the workshop were given manuals on ODS for customs and law enforcement officers. During the workshop, a practical lesson on the use of refrigerant identifier (gas analyzer) to determine the type of refrigerant was held and the safety precautions for handling refrigerants and vessels under the pressure and the necessary personal protective equipment were discussed. There was also a discussion on how to improve the work of the Torugart customs unit.

On November 12, 2019, in the village of Novopokrovka, NOU representatives held training workshop for border officers on the regulation of the import/export/transit of ODS and ODS containing equipment in Kyrgyzstan. The workshop included the following topics: The function of stratospheric ozone and an impact of UV on human health; State program on phase out of ODS in the Kyrgyz Republic; Identification of ODS and equipment containing ODS. Names of ODS and their blends, labelling, CAS/ASHRAE/UN numbers and color codes; Sectors using HCFCs; Ban of ODS-containing products in connection with the entry of Kyrgyzstan into the Customs Union. ODS smuggling methods and cases of ODS smuggling in Kyrgyzstan. 31 customs officers from the northern regions attended the workshop. The workshop included a practical

lesson on the use of a refrigerant identifier (gas analyzer) to determine the type of refrigerant and the safety rules for handling refrigerants and pressure vessels and the necessary personal protective equipment were described.

On November 22, 2019, a joint workshop of the SAEPF and NOU on state environmental control in compliance with the provisions of international environmental conventions in the Kyrgyz Republic was held for employees of the State Inspectorate of Environmental and Technical Safety of the Issyk-Kul and Naryn Oblasts in the village of Bulan-Sogottu, Issyk-Kul Oblast. The workshop was attended by 31 participants. Speakers described the functions of inspectors in the control of ODS handling and ODS emissions, checking of certificates existence of refrigeration technicians and organizations in the refrigeration industry, the role and functions of inspectors in the implementation of the Stockholm, Basel, Rotterdam and CITES conventions. In a practical lesson, participants learned how to use a refrigerant identifier to determine the type of refrigerant, safety rules were described, and what personal protective equipment should be used when handling refrigerants.

On November 29, 2019, a training workshop was held in Osh for border officers on the import/export/transit of ODS and ODS containing equipment in Kyrgyzstan. The workshop included the following topics: The role of stratospheric ozone and the impact of UV on human health; Sectors using HCFCs; State program on phase out of ODS in the Kyrgyz Republic; The regulation of import and export of ODS and ODS containing equipment in Kyrgyzstan and Customs Union. Identification of ODS and equipment containing ODS and the names of ODS and their blends, labelling, CAS/ASHRAE UN numbers and color codes; Cases of ODS smuggling in Kyrgyzstan. 33 participants attended the workshop from the southern regions. ODS training manuals for customs and law enforcement agencies were distributed to all workshop participants. During the workshop, a practical lesson was held on the use of a refrigerant identifier (gas analyzer) to determine the type of refrigerant. Safety rules for handling refrigerants and pressure vessels and the necessary personal protective equipment were described.

For distribution among authorized state bodies, following literature were developed and printed:

- Recommendations for the implementation of state control of import/export of ODS and products containing them for customs and environmental officers.
- Legislative options to phase down of hydrofluorocarbons in the Kyrgyz Republic
- Interstate standards. Refrigeration Systems and heat pumps. Safety and environmental requirements
- Manual on ODS for customs and law enforcement officers
- Guidance on the use of propane as an alternative to HCFC-22 in refrigeration and air conditioning
- Alternatives to ozone-depleting substances
- Real alternatives to HFCs and HCFCs
- Green cooling technologies on CO₂
- Poster “Quick tool for ODS screening”
- Poster “Frequently Used Refrigerants”

Monitoring of ODS handling

In 2019, letters were sent to organizations using ODS, HFCs and natural refrigerants requesting reports on use of refrigerants in 2018. According to the results of the survey, a report was drawn up on the consumption of ODS, HFCs and natural refrigerants in Kyrgyzstan.

Recovery and recycling of refrigerants

At the end of 2019, data collection on the recycling and recovery of refrigerants was carried out. According to the monitoring results, the amount of HCFC-22 recovered was 1015 kg, including 109 kg purified. For the entire period of the project, the extracted CFC-12 (HCFC-22) 20803 (9142) kg, 6885 (818) kg were purified. The table below summarizes the results of recovery and recycling of refrigerants for the entire period of Ozone Center operation.

Years	Recovered (kg)		Recycled (kg)	
	CFC-12	HCFC-22	CFC-12	HCFC -22
2003	750	0	0	0
2004	2864,6	0	1101,9	0
2005	3930,8	0	1501,4	0
2006	1569,8	0	1013,7	0
2007	1900	0	588	0
2008	2142,8	0	700	0
2009	2734	0	843	0
2010	1939	0	707	0
2011	896	0	187	0
2012	721	1109	83	162
2013	588	1517	54	228
2014	325	1158	45	78
2015	158	1255	27	50
2016	123	1420	22	69
2017	61	1004	12	52
2018	58	964	0	70
2019	0	1015	0	109
Total	20803	8127	6885	709

Support local industrial sector in reducing the use of HCFCs

Within the framework of the UNDP project on the phase-out of HCFCs in the Kyrgyz Republic (Phase 2), purchase of tools and equipment for refrigeration technicians, training centers and professional lyceums was conducted. The main purposes of purchasing tools and equipment were:

- Educational capacity building of professional lyceums for improvement of training of refrigeration technicians;

- Educational and technical capacity building of training centers for the training of refrigeration technicians;
- Capacity building of refrigerating technicians in order to be able to switch to alternative ozone-safe technologies.

At present, the distributed equipment and tools are used for their intended purpose, for training and certification of refrigeration technicians, safe servicing, installation and maintenance of refrigeration equipment. Employees of the Ozone Center regularly monitor the use of distributed equipment and tools. The equipment should provide a significant incentive for the development of the refrigeration technicians, which, in addition will be familiar with the requirements of the Montreal Protocol on Substances that Deplete the Ozone Layer. This will contribute to achieve positive results in phasing out of HCFC consumption in the Kyrgyz Republic.

In 2019, in the framework of the HPMP program of Kyrgyzstan, 40 sets of special tools for young refrigeration technicians were purchased. The purchased sets of tools were handed out to young refrigeration technicians from different regions of Kyrgyzstan.

Tool set for beginner refrigeration technicians

No	Name of instruments	Amount
1.	Tool box 18'	1
2.	Vacuum pump VE115N	1
3.	Manifold in the box Value	1
4.	MAPP Gas	1
5.	Burner for MAPP Gas	1
6.	Flanging tool in the box Value	1
7.	Metal Tube expander	1
8.	Set of adapters	1
9.	Universal valve	1
10.	"Harris" solder	28
11.	Tester	1

The main purpose of distributing tools and equipment to refrigeration technicians is to encourage best practices in RAC sector and safe handling of refrigerants with no emissions to the environment.

In April 2019, 30 refrigerant recovery and recycling machines were purchased. These equipment were distributed to service companies working with refrigeration and climate equipment in the different regions of Kyrgyzstan.

Equipment for refrigeration technicians and service centers

No.	Name	Amount
1	Recovery and recycling machines Value VRR12L	30

List of organizations and private enterprises received the refrigerant recovery and recycling machines

1.	LLC "Magnus Company"	Organization, servicing RAC systems	Bishkek city, Chuy oblast
2.	LLC "Climate312"	Organization, servicing RAC systems	Bishkek city, Chuy oblast
3.	CJSC Coca Cola Bishkek Bottlers	Organization, servicing refrigeration systems and equipment	Bishkek city, Chuy oblast
4.	Center "Karakol"	Private enterprise, servicing RAC systems	Karakol town, Issy-Kul oblast
5.	LLC "Snezhnyy bars"	Organization, servicing RAC systems	Bishkek city, Chuy oblast
6.	LLC «GREE SERVICE»	Organization, servicing RAC systems	Bishkek city, Chuy oblast
7.	LLC «Nurtelecom»	Organization, servicing RAC systems	Bishkek city, Chuy oblast
8.	Trading house Frunze and Asia Moll	Organization, servicing RAC systems	Bishkek city, Chuy oblast
9.	OJSC "Shoro"	Organization, servicing refrigeration systems and equipment	Bishkek city, Chuy oblast
10.	LLC "Arto"	Organization, servicing RAC systems	Bishkek city, Chuy oblast
11.	LLC "Teploinvest"	Organization, servicing RAC systems	Bishkek city, Chuy oblast
12.	Hasanbaev Sozam	Private enterprise, servicing RAC systems	Aravan town, Osh oblast
13.	Yuldashev Rustambek	Private enterprise, servicing RAC systems	Jalalabad city, Jalalabad oblast
14.	Begimkulov Kudratillo	Private enterprise, servicing RAC systems	Jalalabad city, Jalalabad oblast
15.	Gulamzhanov Zhanybai	Private enterprise, servicing RAC systems	Batken town, Batken oblast
16.	Begishev Ilia	Private enterprise, servicing RAC systems	Osh city, Osh oblast
17.	Mamadzhanov Bahadir	Private enterprise, servicing RAC systems	Osh city, Osh oblast
18.	Sultanov Alizhan	Private enterprise, servicing RAC systems	Osh city, Osh oblast
19.	OJSC "Oshtorgmontazh"	Organization, servicing RAC systems	Osh city, Osh oblast
20.	OJSC "Rembyttekhnikha"	Organization, servicing RAC systems	Osh city, Osh oblast

21.	Saidumarov Ravshanbek	Private enterprise, servicing RAC systems	Uzgen city, Osh oblast
22.	Baimatov Abduvani	Private enterprise, servicing RAC systems	Jalalabad city, Jalalabad oblast
23.	Kimsanov Chyngyz	Private enterprise, servicing RAC systems	Kara-Kul town, Jalalabad oblast
24.	Streltsov Artem Mikhailovich dairy plant LLC Talas daamy and the dairy plant LLC Emilia	Organization, servicing RAC systems	Talas city, Talas oblast
25.	Karelin Evgeny Arkadevich	Cold storage	Bishkek city, Chuy oblast
26.	Akimenko Vladimir Nikolaevich	Private enterprise, servicing RAC systems	Bishkek city, Chuy oblast
27.	Gerasimenko Sergey Evgenievich	Private enterprise, servicing RAC systems	Bishkek city, Chuy oblast
28.	Ismanov Daniel Ruslanovich	Private enterprise, servicing RAC systems	Bishkek city, Chuy oblast
29.	Abdyrasakov Ruslan Belekovich	ЧП, сервисное обслуживание ХОКВ	Bishkek city, Chuy oblast
30.	Рысбеков Руслан Белекович	ЧП, сервисное обслуживание ХОКВ	г. Бишкек, Чуйская область

The main goal of transferring tools and equipment to refrigeration technicians is to encourage them to work competently and in safe manner for the environment and to introduce best practices for servicing refrigeration equipment in Kyrgyzstan.

In August 2019, in the framework of the project on stimulating end users to transition to HCFC alternatives, 30 refrigeration units working on propane, a natural refrigerant, were purchased. Propane does not destroy the ozone layer and its GWP=3. These units will be distributed among end users for practical demonstration projects on usage of natural refrigerants in the commercial sector.

Refrigeration units for end users stimulating projects

No.	Name	Pieces	Amount
1	Compressor V=15/16 cub.sm., T ₀ =-15C°, Q ₀ =887/1128 Wt	pc.	30
2	Condenser FN 4,4 – 2,9 (delta – 15)	pc.	30
3	Fine filter BCL -032S	pc.	30
4	Capillary tube	m.	60
5	Copper pipe 1/4"	m.	69
6	Schroder valve BC- AV – 04	pc.	30
7	Solder L Ag 5 P	pc.	60
8	Refrigerant R 290	kg.	4,5
9	Copper pipe 1/2	m.	15
10	Pipe insulation K- FLEX 9*12	m.	15

In September 2019, the purchase of special devices was carried out: pressure gauges for monitoring pressure inside refrigerators and during recharging and recovery, and thermal imagers for checking the tightness of refrigerators and freezers. These devices contribute to improve the performance of refrigeration equipment service centers.

Name of devises	Number
Testo 550 Kit - Digital Manifold Gauge	5
Thermal imager Testo 865	2
Smart probe kit for refrigeration systems	5

In November 2019, as part of the demonstration projects on the introduction of HCFC alternatives 3 refrigeration units with increased capacity working on propane and 3 refrigeration storages (containers) were purchased. Work on the installation of refrigeration storages and refrigeration units are planned. Finished refrigeration storages will be demonstrated to refrigeration technicians, representatives of the refrigeration industry and educational institutions of Kyrgyzstan to further support the introduction of natural refrigerants in the country.

Equipment for demonstration projects

No.	Name	Pieces	Amount
1	Compressor Q=1400-1600 Wt	pc.	6
2	Condenser	pc.	6
3	TRV	pc.	6
4	Dehumidifier filter	pc.	6
5	Control Panel NAK320	pc.	3
6	Refrigerant R290	kg.	6
7	Coper pipes	m.	18
8	Solder LCr P6	pc.	18
9	Schrodder valve	pc.	6
10	Pressure switch	pc.	6
11	Air cooler	pc.	6
12	Containers (refrigeration storage)	pc.	3

On April 20-21, 2019, under the support of Ozone Center of Kyrgyzstan the XIII Annual Congress of the Republican Public Association (RPA) "Ecoholod" was held in Bulan-Sogottu village. Representatives of Rival-T, Mayekawa Mycom and EVCO from Russia and Kingspan from Kazakhstan, leading refrigeration experts, representatives of training, government and other interested organizations from Kyrgyzstan took part in the congress. The congress was held with the support of the Ozone Center of Kyrgyzstan.

During the work of the congress, the activities of the RPA Ecoholod for 2018 were discussed and, an action plan for the current year 2019 was developed. Representatives of foreign companies made presentations about compressor oils on the Russian market, their properties and application features, how natural refrigerants as propane, ammonia, water, air, carbon dioxide are used in various refrigeration sectors. Detailed information on controllers used to regulate the operation of RAC systems was provided. The presentation about modular approach in the construction of refrigerated storehouses, examples of the construction of fruit storage facilities, cold rooms with the use of environmentally friendly and safe foams was made.

The participants discussed the issues of training and certification of specialists and technicians in RAC sector in Kyrgyzstan, problems and needs of organizations for the maintenance and installation of refrigeration equipment, themes of future workshops were outlined. Participants actively discussed all topics. According to the results of the congress, an action plan of Ecoholod RPA for the next year was developed taking into account the needs and comments of representatives of the refrigeration sector of Kyrgyzstan.

Official website of Ecoholod RPA www.ecoholod.com.kg is updated on a regular manner, there are number of technical and special literature for refrigeration technicians are available. Under the support of Ozone Center of Kyrgyzstan, annually educational and technical books are printed for experts of refrigeration sector, which are distributed free of charge to the members of Ecoholod RPA.

Training of students from universities and educational organizations of secondary and primary educational organizations to prepare specialists for refrigeration and treatment industries

Since 2008, RPA Ecoholod together with the department Machines and Devices for Food Production at Kyrgyz State Technological University named after I. Razzakov have prepared mechanical engineers in the field of refrigeration and air conditioning. RPA Ecoholod educates electrical mechanics on refrigeration service at Professional Lyceums No.3, No.93, No.94 in Bishkek and Professional Lyceum No.1 in Jalalabad and at the training center of RPA Ecoholod. These kind of activities are carried out with the direct participation of the members of the RPA Ecoholod Association.

According to the agreement between the Ozone Center, RPA Ecoholod and faculty Applied Biotechnologies (ABT), MGU in Moscow, 65 people from Kyrgyzstan entered to the faculty "Refrigeration Engineering" at the above-mentioned Russian university during last seven years. In 2019, 6 students graduated from "Refrigeration Engineering" faculty. Currently, all entrants are studying free of charge at the expense of the Russian Federation.

Number of prepared refrigeration technicians in 2019 for the refrigeration sector of the Kyrgyz Republic

	Educational organization	Number of prepared refrigeration technicians in 2017
1	RPA Ecoholod	83 electrical mechanics
2	KSTU n.a. I.Razzakov	no graduates
3	PL №3 Bishkek	56 electrical mechanics
4	PL №93 Bishkek	43 electrical mechanics
5	PL №94 Bishkek	50 electrical mechanics
6	PL №1 Jalalabad	no graduates
7	ABT MGU in Moscow	6 mechanical engineers
8	Tehnotreningcenter LLC	no graduates
9	PL at Kyrgyz-Uzbek University, Osh	45 electrical mechanics
	Total:	283 refrigeration technicians

In 2019, the Ozone Center assisted the Kyrgyz National Agrarian University in the development of a curriculum for the preparation of students in the specialty "Technologies for the storage of agricultural products." Agreed plans for the provision of training equipment and special literature after the opening of the department for the training of engineers.

From November 3 to 8, 2019, in Osh, trainings on "Electromechanics for repair and maintenance of refrigeration and air conditioning systems" were held for refrigeration technicians. At the end of the courses a special commission took the exam, students who successfully passed the exams were given certificates. In Osh, 83 refrigeration technicians successfully completed the courses and received certificates. The course addressed the following topics:

- Basics of thermodynamics
- Environmental impact of refrigerants and related environmental regulations;
- Checking before starting the refrigeration equipment, after a long idle, after maintenance or repair, or during operation
- Checking for tightness of refrigeration equipment;
- Environmentally friendly installation, operation and service of system and refrigerant recovery;
- Installation, starting and maintenance of piston, screw and scroll compressors, and one- or two-stage systems;
- Installation and maintenance of thermostatic expansion valve and other components of refrigeration equipment
- Assembly of piping systems in a refrigeration unit

Conducting a campaign to raise public awareness

All public awareness activities on the Montreal Protocol on Substances that Deplete the Ozone Layer and the Problem of Ozone Layer Depletion took place under the motto "32 years and healing. Montreal Protocol".

July 15-21, 2019 Representatives of Ozone Center conducted the information campaign "Protection from the Sun -2019" at children camps in Issyk-Kul oblast. The objective of the campaign was to give detailed information to children, supervisors and management of children camps on depletion of ozone layer and further impact of UV radiation on human health and ways to protect oneself from UV radiation. All supervisors of children's camps and children attended a lecture on the ozone layer and measures to protect against UV.

On September 2-6, 2019, the head of the Ozone Center Mars Amanaliev and the assistant at the Ozone Center Kamilia Mukhanova participated in Asia-Pacific Climate Week. They participated in training workshops on accreditation at the Adaptation Fund and Expanding Access to Global Climate Funds in the Asia-Pacific Region. At the seminar, the participants learned about Adaptation Fund accreditation criteria and how to identify relevant supporting documents that can be submitted with the application for accreditation. The event aimed to identify best practices related to direct access accreditation with the Green Climate Fund, proposal development and programming for the Green Climate Fund and Adaptation Fund.

On September 16, 2019, at school-gymnasium No. 69, Bishkek, the seminar devoted to World Ozone day were held for schoolteachers of Pervomaiskiy region. During the seminar lecturers gave a presentations about protection of ozone layer, Montreal Protocol and Kigali amendment, Education for Sustainable development, Montreal Protocol and SDG, Green Pack: Glaciers of Central Asia, Green Steps: multimedia educational resource. A number of teacher participated the seminar was 28 teachers of Pervomaiskiy region, Bishkek, and 30 school pupils of school No.69. All teachers got certificates.

16-18, September 2019 at the Kyrgyz State University of Geology of Mining and Natural Resources named after U. Asanaliev held seminars on the theme: "September 16 - International Day for the Preservation of the Ozone Layer", dedicated to the International Ozone Day. The seminars was attended by: staff of the Department of Environmental Protection and the Economy of Subsoil Use; 3rd and 4th year students studying ecology; students of the specialties "Power Engineering and Electrical Engineering", "Physical Processes of Oil and Gas Production", "Technological Machines and Equipment", "Metallurgy", "Mining". During the seminars, reports on the following topics were presented: "The ozone layer of the Earth and its significance for life"; "September 16, International Day for the Protection of the Ozone Layer"; "Ultraviolet Radiation Index - an indicator of solar radiation on Earth"; "The level of ultraviolet radiation in the summer in the conditions of a mountain climate"; "Measures to protect the public from exposure to ultraviolet radiation." The events were attended by 9 teachers and 43 students.

On September 17, 2019, the Ozone Center of Kyrgyzstan organized a seminar at Professional Lyceum No. 93 in Bishkek, in honor of the International Day for the Protection of the Ozone Layer. Representatives of the NOU spoke about the Montreal Protocol, its history and current achievements, the Kigali Amendment to the Montreal Protocol and the issue of global climate change. Participants attended a lecture on the types of refrigerants and their impact on the environment, as well as on the environmental benefits of using natural refrigerants. The event was attended by teachers of the lyceum and 29 students.

On September 17, 2019, the Ozone Center of Kyrgyzstan and the State Agency for Environmental Protection and Forestry organized a seminar for teachers from Issyk-Ata region in a secondary school in the village Budenovka. The main topics of the seminar were "Ozone Layer Protection", "Education for Sustainable Development", "Behaviors for Sustainable Development", "Montreal Protocol and Sustainable Development Goals", "Green Pack: Glaciers of Central Asia" and "Green Steps: a multimedia educational resource ". NOU jointly with the State Agency for Environmental Protection and Forestry organized a contest among the pupils of the secondary school of the Budenovka village "The Best Poster", "The Best Picture" and "The Best Poem" on the Preservation of the Ozone Layer ". As a prize, the winners received various books and encyclopedias. There were 66 teachers from schools of Issyk-Ata region and 25 students of the secondary school Budenovka.

On September 18, 2019, NOU organized a seminar at Professional Lyceum No. 97 in Bishkek. NOU representatives explained about the Montreal Protocol, and the regulation of ozone-depleting substances, climate change and the Kigali Amendment to the Montreal Protocol. Participants learned how to behave under the Sun to protect themselves from UV radiation. They also explained about the ozone layer, its role for humans and the impact of the depletion of the ozone layer. Lecturers spoke about sectors that use ODS and the environmental properties of natural refrigerants. The event was attended by teachers of the lyceum and about 25 students.

On September 24, 2019, a seminar was held at the Kyrgyz-Uzbek professional lyceum in Osh city. NOU representatives provided information on the Montreal Protocol and its role in the phase-out of ODS and the protection of the ozone layer. They also talked about the ozone depletion problem, the ozone-depleting chemicals and their alternatives, and the environmental properties of natural refrigerants. 35 students attended the seminar.

On September 25, 2019, a seminar dedicated to the International Ozone Day was held at the Osh Technological University named after A. Adyshev in Osh. Representatives of NOU provided information on the Montreal Protocol and its role in the phase-out of ODS. They told in which industries ozone-depleting substances are used, and about the benefits of switching to natural refrigerants. How UV affects people's health and how to protect yourself from excessive UV. 21 students attended the event.

On September 27, 2019, a special activity took place at Jalalabad State University in Jalalabad city. NOU representatives told students about the Montreal Protocol and its role in the phase-out of ODS and the protection of the ozone layer. They also talked about the problem of depletion of the ozone layer, chemicals that destroy the ozone layer, and how to protect yourself from the harmful effects of ultraviolet radiation. They gave information about ODS and its use in different sectors and about alternative natural refrigerants. 24 university students attended the event.

On November 30, 2019, the Youth Climate Forum of Kyrgyzstan was held in Bishkek, more than 350 students, high school pupils, young professionals and eco-activists from different regions of the country took part. The forum was held in order to familiarize young people with the problems of climate change and determine their role in promoting the climate agenda of the Kyrgyz Republic. In addition, participants received information on the Kigali Amendment to the Montreal Protocol and about the role of refrigeration sector in combating climate change.

On December 17, 2019, the National Climate Forum of the Kyrgyz Republic was held in Bishkek, which addressed climate change issues for Kyrgyzstan: post-Paris agreement actions and the role of civil society. The invited speakers spoke about current climate initiatives and discussed scenarios of possible actions at the national level, based on successful international practices. The forum had presentations on topics such as sustainable development prospects in Kyrgyzstan, minimizing the country's carbon footprint, developing regions and enhancing community resilience, climate change economics and private-public sector collaboration to promote a green economy.

Regular reporting on the management of ODS to the Secretariat of the Montreal Protocol, the Multilateral Fund of the Montreal Protocol, UNEP, UNDP

Data on ODS consumption in 2018 were sent to the Multilateral Fund of the Montreal Protocol in March 2019. Reports on the activities of the Ozone Center were sent to the UNEP Division of Technology, Industry and Energy in February 2019. Reports on the progress of the implementation of the HPMP in 2018 and financial reports were sent to UNDP in January 2019.

In 2019, for the first time, a report on the consumption of HFCs for 2018 in Kyrgyzstan was conducted based on information provided by importers and was sent to the UNEP Division of Technology, Industry and Energy.

Published literature for the reporting period

In 2019, the following literature was published and distributed among specialists in the refrigeration sector and representatives of various organizations and government bodies:

1. Interstate standards. Refrigeration Systems and heat pumps. Safety and environmental requirements – 200 copies
2. Guidelines on incentive project for the commercial and industrial refrigeration end-user sector – 50 copies
3. Comic book "17 goals for a better future" - 200 pieces
4. Booklet of 5 steps of a young ecologist in Russian - 400 pieces
5. Booklet of 5 steps of a young ecologist in the Kyrgyz language - 400 pieces
6. Brochure "Current state of the ozone layer" - 100 pieces
7. Brochure "Green refrigeration technologies on CO₂" - 100 pieces
8. Practical guide on certification for refrigeration and air conditioning specialists - 100 pieces
9. Recommendations for the implementation of state control on import/export of ozone-depleting substances, hydrofluorocarbons and products containing them for customs and law enforcement officers - 100 pieces
10. Manual on energy efficiency of refrigeration equipment, air conditioners and heat pumps– 200 copies
11. CD "Green Pack: Glaciers of Central Asia" and "Green Steps: a multimedia educational resource", 100 pieces
12. Brochure "Ratification of the Kigali Amendment. Information note "- 100 copies in Russian and Kyrgyz languages
13. Normative legal acts on energy efficiency of buildings of the Kyrgyz Republic - 200 pieces
14. The methodology for calculating the energy performance of buildings and determining of energy efficiency class for buildings energy certification - 200 pieces
15. Fact sheet "Amendments to the Montreal Protocol on Substances, that Deplete the Ozone Layer Decision XXVIII/1: Additional amendments to the Montreal Protocol» - 100 copies in Russian language
16. Fact sheet "Amendments to the Montreal Protocol on Substances, that Deplete the Ozone Layer Decision XXVIII/1: Additional amendments to the Montreal Protocol» - 100 copies in Kyrgyz language
17. Information note to the draft Law of the Kyrgyz Republic "On ratification of the Kigali Amendment to the Montreal Protocol" -100 copies in Russian language
18. Information note to the draft Law of the Kyrgyz Republic "On ratification of the Kigali Amendment to the Montreal Protocol" -100 copies in Kyrgyz language

Posters

1. Poster "Appropriate Dismantling of Air Conditioners" - 50 copies
2. Poster "Appropriate Dismantling of refrigerators" - 50 copies
3. Poster "Code of Practices for RAC System Servicing" - 50 copies
4. Poster "World Day for the Protection of the Ozone Layer 2019" -10 pieces
5. Poster "Sustainable consumption for sustainable development" - 20 pieces

6. Poster "Combating plastic pollution" - 20 pieces
7. Poster "The circular economy" - 20 pieces
8. Poster "Quick tool for ODS screening" - 50 pieces
9. Roll-up "World Ozone Layer Protection Day 2019" - 1 copy
10. Roll-up "Ozone Center of Kyrgyzstan" - 1 copy

Developed new literature in 2019

1. Guidelines on incentive project for the commercial and industrial refrigeration end-user sector
2. Brochure "Current state of the ozone layer"
3. Brochure "Green refrigeration technologies on CO₂"
4. Poster "Sustainable consumption for sustainable development"
5. Poster "Combating plastic pollution"
6. Poster "The circular economy"
7. Poster "Quick tool for ODS screening"
8. Normative legal acts on energy efficiency of buildings of the Kyrgyz Republic
9. The methodology for calculating the energy performance of buildings and determining of energy efficiency class for buildings energy certification
10. Poster "Appropriate Dismantling of Air Conditioners" - 50 copies
11. Poster "Appropriate Dismantling of refrigerators" - 50 copies
12. Poster "Code of Practices for RAC System Servicing" - 50 copies

List of official letters for the reporting period

1. Letter of the SAEPF to the Ministry of Economy and the State Customs Service on quotas for the import of ozone-depleting substances into the territory of the Kyrgyz Republic for 2019.
2. Letter to the State Customs Service on reporting on the import of HCFC, HFCs substitutes and natural refrigerants for 2017-2018. A list of HCFC substitutes and natural refrigerants was attached to the letter.
3. Letters to organizations Buudan LLC, PE Storzhenko, PE Ovsyannikova, PE Podkopaev, Promholod LLC, KaribeUg LLC, CJSC Shoro, SamsungService LLC, OJSC Rembyttekhnika and Rempromholod LLC on reporting on the import of HFCs and natural refrigerants for 2017-2018. A list of HCFC substitutes and natural refrigerants was attached to the letter.
4. Letters to organizations using blowing agents and other products containing ODS and their substitutes for reporting on the import of HFCs, HCFCs and natural refrigerants for 2017-2018, NTEK LLC, BISTAL LLC, Teplomir LLC, Biast LLC, Creacon LLC, Riman Company LLC, Teplopena LLC and Ecopena LLC.
5. Letters to the State Customs Service, the State Border Service and the State Inspectorate for Environmental and Technical Safety about organization of regular workshops as part of the State Program for the Reduction of ODS Consumption in Kyrgyzstan.

The international cooperation

- 1. 17-20 February 2019**, the head of NOU Mars Amanaliev participated in Meeting of National Ozone Officers for Europe and Central Asia (ECA) in Paris, France, organized by UNEP; Representatives of the parties shared their experiences and achievements, and also discussed the needs. Participants discussed needs and ways to support the ratification of the Kigali Amendment to the Montreal Protocol. The reports of the national ozone offices of Europe and Central Asia were presented. National strategies and components for RAC servicing sector to support phase down of HFCs. The issues of alternatives selection, safety standards and energy efficiency of RAC systems and the prevention of illegal trade and transport of ODS were considered. Representatives from different countries shared their experience in the field of ODS phase out and HFCs phase down.
- 2. 20-21 February 2019**, national consultant of NOU Zholdoshbek Zhumaliev took part in the IX International Scientific and Technical Conference “KAZAKHSTAN-HOLOD 2019”, Almaty, Kazakhstan. The conference was attended by more than 150 experts from Kazakhstan, Russia, Ukraine, Germany, Austria, Belarus, Holland, Switzerland and Uzbekistan, experts from many leading companies were invited, including Bitzer CIS, Danfoss, GEA, Guntner, Thermofin, Criotec, Systems Control, Heat Cool. At the conference topics such as “Modern energy-efficient chillers, devices, refrigeration and air conditioning systems”, “Scientifically-based and cost-effective applied technologies for cooling, freezing, storage and conservation” and “Environmentally friendly and energy-efficient cryogenic technologies and liquefaction natural gas” were discussed.
- 3. 4-7 March 2019**, national consultant of NOU Zholdoshbek Zhumaliev took part in the international exhibition “CLIMATE WORLD - 2019” in Moscow, Russia. The following topics were discussed at the exhibition: Practical application of innovative energy-efficient technologies in construction. Energy-saving technologies for the urban environment. The use of innovative and energy-efficient technologies in the renovation of the buildings; The role of standardization in improving energy efficiency; The use of energy-efficient materials and energy-saving technologies. Zholdoshbek Zhumaliev established contacts with experts in the Russian refrigeration industry, and representatives of Russian companies participated in the congress of RAC Association of Kyrgyzstan "Ecoholod" RPA and in a special workshop on ammonia refrigeration units.
- 4. 5-9 May 2019**, an assistant of NOU Kamilia Mukhanova attended training “COOL Training. The use of natural refrigerants in refrigeration and air conditioning for employees of the National Ozone Units” organized by GIZ Proklima Program in conjunction with the Bundesfachschule Kalte-Klima-Technik. The purpose of the training was to support the implementation of the Kigali Amendment to the Montreal Protocol and to teach the theory and practice of using natural refrigerants (propane, ammonia and carbon dioxide) in the commercial refrigeration sector. The training included a political session, a theoretical and practical part, where participants learned about the Kigali Amendment, energy efficiency, Paris Agreement and the Sustainable Development Goals, the theory of the use of propane and CO₂ as refrigerants. During practical exercises the use of a tester for leakage of flammable gases and fluorinated gases and welding of copper pipes using silver and phosphorus solder were demonstrated.
- 5. 6-9 June 2019**, the head of Ozone Center Mars Amanaliev participated in a meeting of the working group of the Eurasian Economic Commission to discuss the ratification of the

Kigali Amendment to the Montreal Protocol. At the meeting the provisions on the import and export of ODS and ODS-containing products and the implementation of the provisions of the Kigali Amendment in the legislation of the EAEU countries were discussed.

6. **1-7 July 2019**, the head of Ozone Center Mars Amanaliev attended the 41st meeting of the open-ended working group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, Bangkok, Thailand. The topics discussed at the meeting were: unforeseen emissions of CFC-11, Safety Standards for natural refrigerants, the four-year assessment of Ozone Depletion in 2018, the Report of the Technology and Economic Assessment Panel for 2019 and the status of ratification of the Kigali Amendment to the Montreal Protocol.
7. **23-28 September 2019**, the head of the Ozone Center of Kyrgyzstan Mars Amanaliev and Yevgeny Pak, deputy head of the Customs Administration, took part in Europe and Central Asia Network Meeting, Kiev, Ukraine. The meeting focused on policy issues and problems in the ECA region, reporting requirements under the Montreal Protocol, measures to facilitate the ratification of the Kigali Amendment, ODS and HFC quotas, and import/export licensing systems. Participants presented reports on the celebration of World Ozone Day and World Refrigerator Day, and on the status of ratification of the Kigali Amendment to the Montreal Protocol.
8. **4-8 November 2019**, the head of Ozone Center of Kyrgyzstan Mars Amanaliev attended the 31st meeting of the parties to the Montreal Protocol in Rome, Italy. At the meeting reports following issues were discussed: budget of the Trust Fund for the Montreal Protocol and financial; the Problem of Unexpected CFC-11 Emissions; Issues of using methyl bromide; Access to energy-efficient technologies in the sectors of refrigeration equipment, air conditioning systems and heat pumps; Safety standards; Status of ratification of the Kigali Amendment to the Montreal Protocol.
9. **13-15 October 2019**, the national consultant of the ozone center Zholdoshbek Zhumaliev and Rinat Idiatulin, the senior engineer of Nur-Telecom LLC, visited telecommunication offices in Dushanbe, Tajikistan. The aim of visit was to study the results of the project on replacement of equipment on HCFC-22 with alternative technologies in the field of telecommunication and to transit their positive experience to Kyrgyzstan. They obtained specific data and inspected cooling equipment in the telecommunications system of Tajikistan.
Based on the results of the visit, it was decided to purchase a similar technology from Turkey and introduce it on the territory of Kyrgyzstan with the participation of the country's mobile operators on the conditions of stimulating the introduction of alternative technologies. Currently, contacts with suppliers are being made for initiation of tender procedures for the equipment purchase.
10. **3-7 December 2019**, the assistant of the Ozone Center Kamilia Mukhanova and the national consultant Zholdoshbek Zhumaliev participated in Europe and Central Asia (ECA) Ozone2Climate meeting with Montreal Protocol Officers and RAC associations/experts and in SMEITS/KGH'S 50th international HVAC&R congress and exhibition in Belgrade, Serbia. Following topics were discussed at the meeting: Activities of RAC associations, training and certification of refrigeration technicians, accepted safety standards, extraction and recycling of refrigerants, and energy efficiency measures in each country. The congress presented achievements in the field of refrigeration systems and

machines in Serbia and other European Countries. Presentations on the use of heat pumps for heating and hot water were made, and policy issues on the use of HFCs were discussed.

11. In July 2019, the Ozone Secretariat approved a project on transition of special equipment Brewer spectrophotometer for monitoring the ozone layer to a research station in the Issyk-Kul region of Kyrgyzstan. The secretariat has allocated a special grant for the transportation of equipment from Canada, the calibration and training of personnel at the research station.

In 2019 www.climate.kg; www.ozonecenter.kg; www.ecoholod.com.kg; www.climate.kg. were regularly updated with new information.

All activities carried out within the framework of the project were covered in the main mass media of the country:

<https://eco.akipress.org/news:1454381>
<http://ekois.net/xii-ezhegodnyj-sezd-spetsialistov-holodilnoj-otrasli-kyrgyzskoj-respubliki/>
<http://www.ecoholod.com.kg/>
<http://www.ozonecenter.kg/>
<http://www.climate.kg/>
<http://www.customs.kg/index.php/ru/component/content/article/1-latest-news/2381-2019-05-08-10-26-05>
<https://www.mir-klimata.info/event/1715/>
<https://eco.akipress.org/news:1548627/>
<http://ekois.net/parizhskoe-soglashenie-po-izmeneniyu-klimata-i-monrealskij-protokol-dlya-kyrgyzskoj-respubliki/#more-30203>
<http://kabar.kg/news/v-bishkeke-i-oshe-sostoitsia-mezhdunarodnyi-seminar-po-energoeffektivnosti-zdaniy/>
<https://www.kyrseff.kg/2019/10/17/3868/>
<https://maralfm.kg/archives/388981>
<http://gosstroy.gov.kg/ru/v-gorodakh-osh-i-bishkek-sostoyatsya-semina/>
<http://ecoschool.kg/2019/09/14/декада-защиты-озонового-слоя/>
<http://eco.akipress.org/news:1585753?from=portal&place=last&b=1>

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