

Report
on activities of Ozone Center of Kyrgyzstan in 2021.

In 2021, the Ozone Center of Kyrgyzstan carried out activities to coordinate the implementation of the final part of the Program on phase out of ozone-depleting substances in the Kyrgyz Republic.

**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

Improvement of the legal and regulatory framework for ODS control

Decision No. 30 of March 16, 2021 of the Board of the Eurasian Economic Commission on the inclusion of hydrofluorocarbons in the Unified List of Goods to which non-tariff regulation measures are applied in trade with third countries, approved by the Decision of the Board of the Eurasian Economic Commission No. 30 dated April 21, 2015, was adopted.

A draft of the state educational standard for primary vocational education on specialty 7233 "Mechanic for commercial refrigeration equipment" has been developed. Further, the Ministry of Education and Science of the Kyrgyz Republic will approve it. Developed standard is based on the

standards EN 378 Refrigeration systems and heat pumps. Safety and environmental requirements and EN 13313 Refrigeration systems and heat pumps. Competence of personnel and includes special sections devoted to the use of natural refrigerants and their safe handling.

On April 19, 2021, a licensing system for the import and export of HFCs was introduced in the Kyrgyz Republic. Trade with countries that have not ratified the Kigali Amendment will be prohibited from January 1, 2033.

Training of technicians on maintenance of refrigeration equipment

During the reporting period, as part of the implementation of the HCFC Phase-out Management Plan (HPMP), the following training workshops were held for refrigeration industry specialists.

No.	Place	Data	Number of participants
1.	Osh	9 of February 2021	23
2.	Cholpon-Ata	2-3 of April 2021	48
3.	Bishkek	18 of may 2021	24
4.	Bishkek	27 of May 2021	32
5.	Naryn	10 of June 2021	10
6.	Bishkek	15 of June 2021	25
7.	Naryn	23 of September 2021	24
8.	Karakol	26 of September 2021	19
9.	Cholpon-Ata	27 of September 2021	22
10.	Jalal-Abad	6 of October 2021	20
11.	Osh	8 of October 2021	22
12.	Osh	22 of October 2021	25
13.	Jalal-Abad	24 October 2021	25
14.	Bishkek	24 of November 2021	40
15.	Osh	1 of December 2021	25
16.	Cholpon-Ata	14 of December 2021	25

On February 9, 2021 in Osh city, a workshop on the implementation of best practices for safe servicing of refrigeration equipment in the Kyrgyz Republic was held. The workshop covered topics such as Climate Change and the Kigali Amendment to the Montreal Protocol, Alternatives for HCFC and HFC refrigerants. Application of energy efficient green technologies in the refrigeration sector. Participants were told about the requirements of the interstate standard EN 378. The best practice in the repair, installation and maintenance of refrigeration equipment was described in detail, as well as what tools a refrigeration technician should have when working with refrigeration equipment. 23 people attended the workshop.

On April 2-3, 2021 in Cholpon-Ata city, a workshop "Modern and energy efficient technologies in RAC sector of Kyrgyzstan" was held. At the workshop, it was told about the Kigali Amendment to the Montreal Protocol and the problem of climate change, and the issues of improving the energy efficiency of RAC systems were discussed. Alternative technologies to HCFC and HFC refrigerants were presented. The participants learnt about the technology selection among RAC equipment, taking into account energy efficiency indicators, ODP and GWP, and about the automation and operation of RAC equipment. The influence of impurities in refrigerant on operation of refrigeration equipment was

discussed in detail and recommendations were given for the maintenance of small refrigeration units and air conditioning systems.

On May 18, 2021, a workshop on state registry of ODS, HFCs and equipment containing ODS and HFCs for refrigerants importers was held in Bishkek. At the workshop, the general rules for the import and export of ODS/HFCs and ODS/HFCs containing equipment within the Customs Union were described in detail. Participants discussed the general rules for licensing HFCs and HFC-containing products, and were told about providing data on imports and exports of HFCs, including data on importers and exporters, for reporting to the Secretariat of the Montreal Protocol. Following topics were discussed in detail: Decision No. 30 of the Eurasian Economic Commission, a permit documents, and guidelines for filling out a unified conclusion form for the import, export and transit of certain goods. The Provision on the import into the customs territory of the Eurasian Economic Union and export from the customs territory of the Eurasian Economic Union of HFCs and products containing HFCs were presented to participants.

May 27, 2021 a workshop on state HFC registry and reporting was held in Bishkek. At the workshop, Decision No. 30 of the Eurasian Economic Commission on the introduction of licensing of HFCs was explained. The participants were explained the rules for HFCs licensing in Kyrgyzstan. They talked about electronic reporting of HFCs and equipment containing HFCs. Demonstrated how to fill out HFC registry forms and that reporting is needed to calculate HFC emissions in the country. It was told about the recycling and recovery of waste refrigerants and said that centers for the collection of contaminated refrigerants would be set up. The provisions of the Kigali Amendment and the schedule for phasing down of HFCs were discussed in detail.

On June 10, 2021, a workshop on state registry of ODS, HFCs and equipment containing ODS and HFCs for refrigeration technicians was held in Naryn city. The participants learnt that the Kigali Amendment had come into force and began to regulate HFCs import/exports and about the rules for the import and export of ODS/HFCs and ODS/HFCs containing equipment within the Customs Union. The participants learnt about the provision of data on imports and exports of HFCs to the Secretariat of the Montreal Protocol. The electronic registry of the refrigerants consumption and equipment containing refrigerants was discussed in detail. Participants were told and clearly shown how to fill out an electronic and printed form for registry of refrigeration equipment. During the workshop, refrigeration technicians were assisted in completing electronic reporting forms.

On June 15, 2021, a workshop “Climate Change and Energy Efficiency of Refrigeration and Air Conditioning” dedicated to World Refrigeration Day was held. At the workshop, the participants learnt about the Kigali Amendment to the Montreal Protocol and the problem of climate change, energy efficiency of RAC equipment and the introduction of natural refrigerants. There was a detailed discussion of the cold chain, the challenges and solutions for creation of a sustainable cold chain, as well as the relationship between the SDGs and the provision of the cold chain in the world. The thermodynamic properties and advantages of natural refrigerants were explained to participants.

On September 23, 2021, a workshop on the use of special refrigeration equipment in the Kyrgyz Republic was held in Naryn town. The workshop was attended by refrigeration technicians from Naryn city and nearby settlements, where they learned about the Montreal Protocol, the problem of ozone depletion and global warming, as well as the Kigali Amendment and the regulation of HFCs in the world and Kyrgyzstan. They were given detailed information about alternatives to HCFC and HFC, refrigerant recovery and retrofitting of existing systems. Practical exercises were held on the use of special

refrigeration equipment and the introduction of best practices for servicing refrigeration equipment, and sets of special technical equipment were handed over to refrigeration technicians.

On September 26, 2021, a training workshop on the use of special refrigeration equipment in the Kyrgyz Republic was held in Karakol town. At the workshop, the participants were told about the Montreal Protocol and the Kigali Amendment, their goals and objectives, and the regulation of the import and consumption of HFCs in Kyrgyzstan. The participants learned about the features of the use of natural refrigerants, the recovery of used refrigerants and the retrofit of existing systems. Practical exercises were held on the application of modern refrigeration equipment and the implementation of best practices for servicing refrigeration equipment, and the prevention of possible refrigerant emissions. At the end of the workshop, sets of special technical equipment were handed over to refrigeration technicians.

On September 27, 2021, in Cholpon-Ata town, a workshop on the use of special refrigeration equipment in the Kyrgyz Republic was held. The following topics were considered at the workshop: Montreal Protocol on Substances that Deplete the Ozone Layer, Kigali Amendment and regulation of HFCs in Kyrgyzstan, global problems of ozone layer depletion and climate change. The best practices for servicing RAC what refrigeration technicians need to know to introduce vest practice were described in detail. At the workshop, a practical lesson on the use of special refrigeration equipment was held and the features of work when servicing refrigeration equipment were shown. The sets of special technical equipment were handed over to refrigeration technicians.

On October 6, 2021, a workshop on state registry of ODS, HFCs and equipment containing ODS and HFCs for refrigeration technicians was held in the Jalal-Abad town. The workshop participants learned about the HFC licensing in Kyrgyzstan. It was told about the Kigali Amendment and the registry of HFC consumption to determine the consumption of HFCs in Kyrgyzstan. The schedule for phasing down of HFCs was discussed in detail. Online registry on HFCs and other refrigerants consumption and equipment containing refrigerants were presented. Participants were shown how to fill out an electronic and printed form for registry of refrigeration equipment, and participants filled out the forms on their own.

On October 8, 2021, a workshop on state registry of ODS, HFCs and equipment containing ODS and HFCs for refrigeration technicians was held in Osh city. The ratification of the Kigali Amendment and the introduction of a licensing system for HFCs were discussed. A schedule of HFC phase down was presented and information on the forthcoming freeze in HFC consumption in the country was given. It was also explained why it is so important to provide information on the consumption of HFCs in refrigeration sector and on the import of HFCs. Participants were told how to fill out an electronic and printed registry form for recording refrigeration equipment and HFC/ODS consumption. During the workshop, refrigeration technicians were assisted in completing electronic reporting forms on refrigerant consumption.

On October 22, 2021, in Osh city a workshop on the recovery and recycling of refrigerants in the Kyrgyz Republic was held. Topics covered at the workshop: Global Climate Change and the Kigali Amendment to the Montreal Protocol, System of certification of specialists and enterprises working with refrigeration equipment. Detailed information was provided on refrigerant recovery methods and safety handling of HCFC, HC and HFC refrigerants, vacuum pump maintenance, filling station and refrigerant recovery and recycling machine. During practical lesson, participants learnt how to use a modern refrigerant recovery and recovery machine. It was clearly shown how the equipment is

connected to the cylinders and RAC system. Sets of special technical equipment for refrigeration technicians were handed out at the workshop.

On October 24, 2021, in Jalal-Abad city a workshop on the recovery and recycling of refrigerants in the Kyrgyz Republic for refrigeration technicians was held. The workshop covered the following topics: Protection of the ozone layer, Kigali Amendment and HFC Phase down in Kyrgyzstan. It was explained about correct installation, testing and adjustment of refrigeration equipment, passive recovery of refrigerants, overflow method, accelerated recovery using system compressor, Active recovery using recovery machines and using an oil separator. Technical recommendations on refrigerant recycling and recovery were presented. At the end of the workshop, sets of special technical equipment were handed out to refrigeration technicians.

On November 24, 2021 in Bishkek, a workshop on the state program "Final phase out of HCFCs in the Kyrgyz Republic (HPMP)" was held. This workshop addressed the impact of HFCs on climate change and how the Kigali Amendment contributes to the fight against climate change. The participants were told about the achievements and lessons learned during the implementation of the state program to phase out HCFCs. It was said that a ban on the import of HCFCs was introduced in 2020, and from April 2021 the import, export and transit of HFCs are subject to licensing on the territory of the Eurasian Economic Community. The participants discussed an action plan and measures to reduce the consumption of HFCs in Kyrgyzstan and issues related to licensing of HFCs. The issues of energy efficiency in the RAC sector were considered.

On December 1, 2021, in Osh city, a workshop on the state program "Final phase-out of HCFCs in the Kyrgyz Republic (HPMP)" was held. At this workshop, the participants were told about the completion of the state program, it was told about the components of the state program and what tasks were completed, as well as what tasks still have to be solved in the future. The impact of HFCs and ODSs on climate change and how the implementation of the Kigali Amendment will help reduce GWP emissions and combat global warming were discussed. The participants were explained about the licensing of HFCs, which types of HFCs were included in the list and how they can obtain licenses for the import of HFCs. The participants discussed measures to reduce the consumption of HFCs in Kyrgyzstan and the collection of contaminated refrigerant in the south of the republic. They talked about the importance of introducing natural refrigerants and improving the energy efficiency of RAC equipment.

On December 14, 2021, in Cholpon-Ata city, a workshop on the state program "Final phase-out of HCFCs in the Kyrgyz Republic (HPMP)" was held. The participants were told about the completion of the state program on the final phase out of HCFCs in the Kyrgyz Republic and about the main conclusions made during the implementation of the program. The workshop addressed the climatic implications of hydrofluorocarbon (HFC) emissions following the implementation of the Kigali Amendment and the Kigali Amendment Action Plan for Kyrgyzstan. The participants were told about the rules of import and export of HFCs to/from the customs territory of the Eurasian Economic Union. A review of modern and energy-efficient alternatives to HFCs with low GWP for the RAC sector was carried out, a retrofit of existing systems for natural refrigerants and the specifics of the selection of refrigeration and air conditioning equipment, taking into account energy efficiency indicators, were described.

Implementation of international standards for training specialists of RAC sector

On May 26, 2021, a round table was held to discuss the working version of the State educational

standard for primary vocational education on specialty 7233 "Mechanic for commercial refrigeration equipment". Speakers told about the standard and its content, which modules are included and how many hours are allocated for each module. Representatives of professional lyceums and the Republican Scientific and Methodological Center discussed the standard and modules. The participants expressed their recommendations and comments on this standard, and recommended the standard for approval by the Republican Scientific and Methodological Center and the Ministry of Education and Science of the Kyrgyz Republic.

Training of representatives of authorized state bodies
(Customs and border services and ecological and technical inspectorate)

During the reporting period, as part of the implementation of the HCFC Phase-out Management Plan (HPMP), the following training seminars were held for border and customs officers:

No.	Place	Data	Number of participants
1	Leninskoe village	16 of February 2021	27
2	Novopokrovka village	19 of February 2021	25
3	Osh	25 of February 2021	30
4	Osh	27 of February 2021	30
5	Checkpoint "Madaniyat"	31 of May 2021	7
6	Custom office “Djalal-Abad”	1 of June 2021	20
7	Checkpoint "Erkeshtam"	2 of June 2021	18
8	Custom office “Osh”	3 of June 2021	28
9	Employees of checkpoints "Dostuk", "Bor-Dobo", "Karamyk"	4 of June 2021	20
10	Custom office “Naryn”	8 of June 2021	21
11	Checkpoint "Torugart"	9 of June 2021	12
12	Leninskoe village	16 of June 2021	32
13	Custom office «Batken»	12 of October 2021	44
14	Custom office «Batken» checkpoints	13 of October 2021	20

On February 16, 2021, in Leninskoe village, the representatives of the Ozone Center held a training workshop on State regulation of import/export/transit of ODS, HFCs and equipment containing ODS and HFCs for customs officers. The participants were told about the Montreal Protocol on Substances that Deplete the Ozone Layer, the Kigali Amendment and climate change, as well as the State Program on phase out of ODS in the Kyrgyz Republic. Topics covered were the definition of ODS/HFCs and equipment containing ODS/HFCs, trade names for ODS/HFCs and their mixtures, labeling, CAS/ASHRAE/UN numbers and color codes. The participants learned how to find incorrectly labeled containers and refrigerant cylinders. They discussed about cases of ODS smuggling in Kyrgyzstan. 27 customs officers attended the workshop. Also during the workshop, practical lesson on the use of a refrigerant identifier (gas analyzer) to determine the type of refrigerant was conducted and the basics of safety when handling refrigerants and pressure vessels were explained.

On February 19, 2021, in Novopokrovka village a workshop on State regulation of import/export/transit of ODS, HFCs and equipment containing ODS and HFCs for officers of the State Border Service was held. The workshop considered such topics as the definition of HFCs and equipment

containing HFCs, mixtures of HFCs. The participants were given recommendations on the implementation of state regulation of the import/export of ODS, HFCs and products containing them. It was told about the regulation of import/export of HFCs and HFC-containing products in connection with the ratification of the Kigali Amendment by the Kyrgyz Republic. Cases of ODS smuggling in Kyrgyzstan and general methods of smuggling ODS and ODS-containing equipment were described. During the workshop, a practical exercise was given on the use of the refrigerant identifier to identify the type of refrigerant and the safety measures for handling refrigerants and pressure vessels and the necessary personal protective equipment were explained.

On February 25, 2021, in Osh city a training workshop on State regulation of import/export/transit of ODS, HFCs and equipment containing ODS and HFCs for customs officers of the southern region was held. The workshop covered topics like the Montreal Protocol, ODS regulation and national legislation in the field of ozone layer protection. It was told in detail about the State Program on phase out of ODS. The customs officers were told in detail about the definition of ODS and equipment containing ODS and HFCs, trade names of ODS/HFCs and their mixtures, labeling, CAS/ASHRAE/UN number, and color codes. The methods of smuggling ODS and HFCs, methods of detecting incorrectly labeled containers, cases of smuggling ODS in Kyrgyzstan were discussed. At the end of the workshop, a practical lesson on the use of a refrigerant identifier (gas analyzer) to determine the type of refrigerant was held and safety measures when handling refrigerants and personal protective equipment were explained.

On February 27, 2021, in Osh city, a training workshop was held on State regulation of import/export/transit of ODS, HFCs and equipment containing ODS and HFCs for officers of the State Border Service of the southern region was held. The workshop covered topics such as the function of stratospheric ozone and the impact of UV radiation on human health and other organisms, it was told about the state program on phase out of ODS in the Kyrgyz Republic. The participants learnt about definition of ODS/HFC and equipment containing ODS/HFCs and the names of ODS/HFCs, labeling, CAS/ASHRAE/UN numbers and color codes. Sectors using HCFCs and HFCs, methods of ODS smuggling and cases of ODS smuggling in Kyrgyzstan were presented. During the workshop, a practical lesson on the use of a refrigerant identifier to determine the type and composition of a refrigerant was conducted, and the safety rules for handling refrigerants and cylinders containing HFC/ODS and HC were discussed.

On May 31 - June 4, 2021, the staff of the Ozone Center conducted training at checkpoints at the border of Kyrgyzstan for employees of the customs points Dostuk, Karamyk, Erkeshtam, Bor-Dobo and Osh and Djalal-Abad Custom Offices in Osh and Jalal-Abad oblasts. The participants were told about the legislation in the field of protection of the ozone layer and climate change, about cases of smuggling in the country and methods of ODS and HFC scanning. Participants learnt about customs codes, CAS, ASHRAE/UN numbers for refrigerants of all groups. Recommendations on the implementation of state regulation for the import/export of ODS and HFC and products containing them were given. Practical lesson on how to use the refrigerant analyzer was held and safety measures when working with the analyzer and refrigerant cylinders were explained.

On June 8-9, 2021, the Ozone Center conducted training at the checkpoints on the border of Kyrgyzstan for the employees of Torugart customs point and the officers of the Naryn Customs Office in Naryn oblast. The participants were told in detail about the law "On the protection of the ozone layer", about cases of smuggling in the country and methods of detecting smuggling and false labeling of ODS and HFCs. Customs codes, CAS/ASHRAE/UN numbers for ODS and HFCs were explained. A practical lesson on working with the refrigerant identifier was carried out, a complete algorithm for working with

the device was shown, and safety measures when working with the analyzer and refrigerants were explained.

On June 16, 2021, in Leninskoe village a training workshop on State regulation of import/export/transit of ODS, HFCs and equipment containing ODS and HFCs for new recruits of the Customs Service was held. The participants were told about the Montreal Protocol on Substances that Deplete the Ozone Layer, the Kigali Amendment and climate change, as well as ozone-depleting substances and hydrofluorocarbons. Definitions of ODS/HFCs and equipment containing ODS/HFCs, trade names for ODS/HFCs and their blends, labeling, CAS/ASHRAE/UN numbers and color codes were explained. The participants were explained how to find incorrectly labeled containers and refrigerant cylinders. They learnt about cases of ODS smuggling in Kyrgyzstan. 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 for handling refrigerants and pressure vessels were discussed.

On October 12-13, 2021, employees of the Ozone Center conducted workshop0020for employees of customs checkpoints in Batken region and the Customs Office “Batken”. The participants were told about the legislation in the field of protection of the ozone layer, the regulation of ODS and HFCs and cases of smuggling of ODS and HFCs in the country and methods of smuggling detection. It was told about the reporting on import and export of HFCs from the customs service. Practical exercises were held on working with the refrigerant analyzer to check the contents of refrigerant cylinders, and the safety measures when working with the analyzer and refrigerants were described.

Monitoring of ODS handling

In 2021, official letters were sent to organizations using ODS, HFCs and natural refrigerants requesting reports on use of refrigerants in 2020. According to the results of the survey, a report was drawn up on the consumption of ODS, HFCs and natural refrigerants in Kyrgyzstan for Multilateral Fund.

Recovery and recycling of refrigerants

In 2021, data were collected for the first half of this year on the recycling and recovery of refrigerants. According to the monitoring results, the amount of CFC-12 (HCFC-22) recovered was **0** (2900) kg, including 0 (153) kg of purified. Over the entire period of the project, the recovered CFC-12 (HCFC-22) amounted to **20803 (13102) kg**, purified amounted to **6885 (1086) kg**. The table below summarizes the results of the recovery and recycling of refrigerants over the entire period of operation of the Ozone Center.

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
2020	0	1060	0	115
2021	0	2900	0	153
Total	20803	13102	6885	1086

Support local industrial sector in reducing the use of HCFCs

In the framework of UNDP project phase out HCFCs in the Kyrgyz Republic (stage 2), tools and equipment were purchased for refrigeration technicians, training centers and professional lyceums. The main objectives of the purchase of tools and equipment are:

- capacity building of professional lyceums in training and education of refrigeration technicians;
- educational and technical capacity building of training centers for the training of refrigeration technicians;
- capacity building of refrigeration technicians to switch to alternative ozone-friendly technologies.

Currently, the handed out equipment and tools are used for their intended purpose, namely for training and certification of refrigeration technicians and improving the level of service, installation and repair of refrigeration equipment. The staff of the Ozone Center regularly monitors the use of handed out equipment and tools.

In 2021, special equipment was received, this equipment was purchased in 2020 by UNDP bidding for special equipment to increase the technical capacity of the refrigeration and air conditioning equipment servicing sector for a total of US \$ 90,000. The list of equipment is presented below.

No7.	Name
1.	A RESERVOIR (GAS HOLDER) FOR STORING LIQUEFIED GAS WITH A VOLUME OF 4.5 M3 OR MORE
2.	TWO STAGE VACUUM PUMP
3.	REFRIGERANTS RECYCLING AND RECOVERY UNIT
4.	KIT SPARES FOR REFRIGERANT RECOVERY UNIT
5.	PORTABLE RECOVERY STATION
6.	SPARE KITS FOR PORTABLE RECOVERY STATION
7.	CYLINDER FOR REFRIGERANT WITH OFP
8.	CYLINDER FOR RECOVERY
9.	FREE COOLING SYSTEM

In 2021, work on the installation of propane refrigeration units for cold rooms was completed. These cold rooms will be used to demonstrate the efficiency of propane refrigeration units. At the moment, these cold rooms are being tested for operation in different conditions.

In May and June 2021, 56 sets of refrigeration servicing equipment and tools were purchased for refrigeration technicians. This equipment helps refrigeration technicians, organizations and educational

institutions to conduct their activities at the proper level and implement best practices for servicing RAC equipment. All sets of equipment were distributed to refrigeration technicians and educational institutions that train personnel for the refrigeration sector.

No.	Name	Quantity
1.	Vacuum pump VE115N	56
2.	Manifolding on the case	56
3.	MAPP Gas	56
4.	Burner for MAPP Gas	56
5.	Flanging tool in the box by Value with tube cutter	56
6.	Metal Tube expander 6-22	56

In 2021, in the framework of the project stimulation of end users to switch to alternatives for HCFCs and HFCs, negotiations were held with end users to replace refrigeration units operating on R22 with units, working on propane. Propane does not deplete the ozone layer and it’s GWP = 3. These units were handed over to end users for practical demonstration of the use of natural refrigerants in the commercial sector.

List of distribution of condensing units operating on R290 (propane)

№	Name	Quantity	Work Place	Place and date of equipment distribution
1.	Isabekov Talgat Botobekovich	2 pc.	PE, Isfana town	Bishkek, 5 April 2021.
2.	Baymatov Abdigani Tursunovich	1 pc.	PE, Kyzyl-Kiya town	Bishkek, 5 April 2021.

In April 2021, “Nurtelecom” LLC received 8 FREE COOLING systems from Barantech, Turkey. This system monitors the load of the air conditioning system and helps to reduce electricity consumption in mobile stations. This equipment was installed as demonstration projects to show the energy and cost benefits of these systems to the specialists of mobile companies.

In September 2021, 2 tanks were purchased for the collection and storage of contaminated refrigerant. These tanks were installed as collection points for refrigerants in the cities of Osh and Jalal-Abad.

In November and December 2021, 3 refrigeration units and 3 refrigeration chambers were purchased for the dissemination of modern technologies through demonstration projects and subsequent seminars for end users and refrigeration technicians. A container was purchased to store the equipment.

No.	Name	Quantity	Price, Som
1	Container 20 feet	1	123 760
2	Refrigerating chamber KXH-3.86	3	414 000
3	Refrigeration unit MB109S (monoblock)	3	308 400

In November 2021, refrigerated display cases were purchased for demonstration projects on replacement of compressor units with propane units. Propane as a refrigerant has good technical characteristics, but is an explosive gas, so these units will be used to demonstrate the safe handling of propane as a refrigerant for refrigeration technicians and end users.

No.	Name	Quantity	Price, Som
1	Refrigerated display cases Nova BXC-1,0	6	294 000

List of recipients of refrigeration service equipment and tools for refrigeration technicians in 2021

№	Name	Quantity	Work Place	Place and date of equipment distribution
1.	Kyrgyz State Technical University and named after I.Razzakov	10 pc.	Bishkek	Bishkek, September 27, 2021
2.	Kyrgyz National Agrarian University named after K.I. Skriabin	10 pc.	Bishkek	Bishkek, September 23, 2021
3.	Sekenaliev Beksultan	1 pc.	PE, Bishkek	Bishkek, June 26, 2021
4.	Sharshenbekova Venera	1 pc.	PE, Bishkek	Bishkek, June 26, 2021
5.	Dzhumalieva Elmira	1 pc.	PE, Bishkek	Bishkek, June 26, 2021
6.	Omuralieva Baktygul	1 pc.	PE, Naryn	Naryn, October 2021
7.	Sulaiman uulu Aman	1 pc.	PE, Naryn	Naryn, October 2021
8.	Toktakun uulu Bakytbek	1 pc.	PE, Naryn	Naryn, October 2021
9.	Kutmanov Adylbek	1 pc.	PE, Naryn	Naryn, October 2021
10.	Kasymov Niyazbek	1 pc.	PE, Naryn	Naryn, October 2021
11.	Duishenbiev Zhenishbek	1 pc.	PE, Naryn	Naryn, October 2021
12.	Adonin Victor	1 pc.	PE, Bishkek	Bishkek, October 2021
13.	Pobortsev Roman	1 pc.	PE, Bishkek	Bishkek, October 2021
14.	Mikhailuk Rodion	1 pc.	PE, Bishkek	Bishkek, October 2021
15.	Khidriev Magomedrasul	1 pc.	PE, Bishkek	Bishkek, October 2021
16.	Egenberdiev Edik	1 pc.	PE, Bishkek	Bishkek, October 2021
17.	Batyrbek uulu Adilet	1 pc.	PE, Cholpon-Ata	Cholpon-Ata, September 2021
18.	Pavlunin Igor	1 pc.	PE, Cholpon-Ata	Cholpon-Ata, September 2021
19.	Popov Nikolay	1 pc.	PE, Cholpon-Ata	Cholpon-Ata, September 2021

20.	Chuvichkin Alexander	1 pc.	PE, Cholpon-Ata	Cholpon-Ata, September 2021
21.	Andryushenko Petr	1 pc.	PE, Cholpon-Ata	Cholpon-Ata, September 2021
22.	Nurlanbek uulu Ruslan	1 pc.	PE, Cholpon-Ata	Cholpon-Ata, September 2021
23.	Garifulin Zarif	1 pc.	PE, Karakol	Karakol, September 2021
24.	Vitaly Neklyudov	1 pc.	PE, Karakol	Karakol, September 2021
25.	Dzhantayev Kudaibergen	1 pc.	PE, Karakol	Karakol, September 2021
26.	Boyko Alexander	1 pc.	PE, Karakol	Karakol, September 2021
27.	Zhumakadyrov Edilbek	1 pc.	PE, Karakol	Karakol, September 2021
28.	Kasymaliev Zhanybek	1 pc.	PE, Karakol	Karakol, September 2021
29.	Narkulov Bekbolot	1 pc.	PE, Karakol	Karakol, September 2021
30.	Abdurakhmanov Sultanmurodzhon	1 pc.	PE, Osh	Osh, October 2021
31.	Zakirov Kamronbek	1 pc.	PE, Osh	Osh, October 2021
32.	Muzaffarov Akbarzhon	1 pc.	PE, Osh	Osh, October 2021
33.	Usmanov Azizbek	1 pc.	PE, Osh	Osh, October 2021
34.	Khamudov Ilkhomjon	1 pc.	PE, Osh	Osh, October 2021
35.	Asrankulov Zhavlanbek	1 pc.	PE, Jalal-Abad	Jalal-Abad, October 2021
36.	Begimkulov Kudratillo	1 pc.	PE, Jalal-Abad	Jalal-Abad, October 2021
37.	Raimzhanov Zhamaldin	1 pc.	PE, Jalal-Abad	Jalal-Abad, October 2021
38.	Makhkamov Ilkhomjon	1 pc.	PE, Jalal-Abad	Jalal-Abad, October 2021
39.	Egamnazarov Khalilillo	1 pc.	PE, Jalal-Abad	Jalal-Abad, October 2021
40.	Orozbaev Kalysbek	1 pc.	PE, Cholpon-Ata	Cholpon-Ata, April 2021 г.
	Total:	58 pc.		

List of recipients of refrigerant recovery machine

	Organization	Quantity	Place and date of equipment distribution
1.	Kyrgyz National Agrarian University named after K.I. Skriabin	1 pc.	Bishkek, October 2021

List of recipients of experimental demonstration refrigerating chambers with two refrigeration units on natural refrigerant R290

№	Organization	Quantity	Work Place	Place and date of equipment distribution
1.	Ecoholod RPA	3 sets	Bishkek	Bishkek, June 2021

List of recipients of refrigeration equipment repair tools kit

	Organization	Quantity	Work Place	Place and date of equipment distribution
1.	Ecoholod RPA	3 sets	Bishkek	Bishkek, September 2021

List of distribution of condensing units operating on R290 (propane)

№	Name, Surname	Quantity	Work Place	Place and date of equipment distribution
1.	Isabekov Talgat	2 pc.	PE, Isfana town	Bishkek, 5 th of April 2021
2.	Baimatov Abdigani	1 pc.	PE, Kyzyl-Kiya town	Bishkek, 5 th of April 2021

List of recipients of FREE COOLING FCS 190C190

	Organization	Quantity	Work Place	Place and date of equipment distribution
1.	Nurtelecom LLC	8 pc.	Bishkek	Bishkek, 2021

Gas tank distribution list

	Organization	Quantity	Work Place	Place and date of equipment distribution
1.	Ecoholod RPA	4 pc.	Bishkek	Bishkek, October 2021

On March 30-31, 2021, the 15th regular congress of the refrigeration industry specialists of the Kyrgyz Republic was held, organized by Ecoholod RPA with the support of the Ozone Center of Kyrgyzstan. During the congress, the report on the activities of Ecoholod RPA for 2020, the introduction of a licensing system for hydrofluorocarbons in the Kyrgyz Republic, minimum energy efficiency standards in the refrigeration sector and opportunities to improve the efficiency of refrigeration and climatic equipment were considered. The participants discussed issues of organizing state registry of refrigerants and equipment containing them, expanding the use of natural refrigerants and features of maintenance. The congress delegates discussed the problem of training specialists in the refrigeration industry at the vocational and university education level, and certification for compliance with modern standards in connection with the transition to low GWP and natural refrigerants.

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

Since 2008, Ecoholod RPA has been training refrigeration technicians. Also, other universities and vocational schools (VS) train specialists for the country's refrigeration industry. In particular, the department Machines and Devices for Food Production at Kyrgyz State Technological University named after I. Razzakov trains mechanical engineers in the field of refrigeration and air conditioning, VS No. 3 g, VS No. 93, VS No. 94 and VS No. 97 in Bishkek, VS at Kyrgyz-Uzbek University in Osh train electromechanics in the repair of refrigerators. Activities in this direction are carried out with the direct participation of members of the Ecoholod RPA.

According to the agreement between the Ozone Center, Ecoholod RPA 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. Currently, all entrants are studying free of charge at the expense of the Russian Federation.

Number of prepared refrigeration technicians in 2021 for the refrigeration sector of the Kyrgyz Republic

	Educational organization	Number of prepared refrigeration technicians
1	RPA Ecoholod	21 refrigeration technicians
2	KSTU n.a. I.Razzakov	no graduates
3	PL №3 Bishkek	36 electrical mechanics
4	PL №93 Bishkek	47 electrical mechanics
5	PL №94 Bishkek	20 electrical mechanics
6	PL №1 Jalalabad	no graduates
7	ABT MGU in Moscow	4 mechanical engineers
8	Tehnotreningcenter LLC	3 refrigeration technicians
9	PL at Kyrgyz-Uzbek University, Osh	7 electrical mechanics
	Total:	168 refrigeration technicians

Conducting a campaign to raise public awareness

From February to May 2021, a documentary movie on the achievements of the Ozone Center over 20 years of work was developed. The film describes how the requirements of the Montreal Protocol were implemented in Kyrgyzstan, shows the results of the work of Ozone Center, Ecoholod RPA and refrigeration technicians in Kyrgyzstan. The film demonstrates the fact that ODS was phased out in Kyrgyzstan. It includes the successes and achievements of the refrigeration industry in Kyrgyzstan and interviews with representatives of the refrigeration industry, universities, vocational schools and medicine. On June 29, 2021, the film was shown on the KTRK channel in Russian with English subtitles.

On May 15, 2021, a short video was shot on the topic "Climate Change and Sustainable Consumption" on the basis of gymnasium school No. 69. School students prepared a little performance about the ozone layer and how it protects the Earth from harmful solar UV. Teachers organized talk show where they talked about the problems of climate change, waste, energy efficiency and sustainable use of natural resources and how human activities have influenced climate change and the depletion of the ozone layer. **On June 5, 2021**, on the ElTR channel, this talk show was shown under the title "June 5 World Environment Day" in the Kyrgyz language.

On June 26, 2021, a scientific seminar "World Refrigeration Day and Energy Efficiency Issues" was held in Bishkek at Kyrgyz State Technical University named after I.Razzakov, dedicated to the World Refrigeration Day. The seminar covered topics like the Kigali Amendment to the Montreal Protocol, highlighted the problems of energy efficiency in RAC sector and the issues of introducing a sustainable cold chain. Students of the Technology Faculty presented their research works in the area of environmental protection and nature resources management. The best works were awarded with certificates and prizes - sets of special tools for a beginning refrigeration technician. An exhibition of equipment and literature published by the Ozone Center was made at the seminar.

On September 21, 2021, a seminar for schoolteachers of Bishkek city was held at school-gymnasium No. 69. During the seminar, lecturers spoke in detail about the protection of the ozone layer and the Montreal Protocol on Substances that Deplete the Ozone Layer, the Kigali Amendment to the Montreal Protocol and climate change, a sustainable cold chain and 17 Sustainable Development Goals (SDGs). The teachers were told in detail about the role of the cold chain and why it is so essential in human life, the importance of sustainable cold chain in food processing and trade, food preservation and vaccine transport. They talked about sustainable consumption of goods containing ozone-depleting substances, energy saving issues at home and at work. A totally 32 teachers took part in the seminar. At the end of the seminar, the school students performed a performance on the protection of the ozone layer and the creation of an ODS-free cold chain, talked about the role of technicians in the refrigeration industry, in maintaining the cold chain and preventing refrigerant emissions.

On September 29, 2021, at the Kyrgyz National Agrarian Academy named after V.I. Scriabin, a seminar for students and teachers of the Department of Agricultural Products Processing was held. The participants were told in detail about the goals and objectives of the Montreal Protocol, the theme of this year "Montreal Protocol: keeping us, our food and vaccines cool", and the consequences of ozone depletion. Separately, it was told about the Kigali Amendment, its goals and combatting against climate change, and the relationship of HFCs with global warming. A presentation on cold chains and logistics centers for storing food and transporting vaccines was made, explaining why sustainable cold chains were important and how they contribute to the achievement of the Sustainable Development Goals. In addition, 10 sets of special equipment were handed over to the department for conducting practical exercises on the best practice of servicing refrigeration equipment.

On September 30, 2021, NOU organized a seminar at the vocational lyceum No. 93 in Bishkek. NOU representatives spoke about the Montreal Protocol, its history and current achievements. They also explained about the ozone layer, its role in human's health and the consequences of ozone depletion. They also talked about the problem of climate change, the adoption of the Kigali Amendment and the regulation of HFCs. A presentation on the cold chain, what structures it consists of and how to organize it correctly was made. At the end of the seminar, 5 sets of special equipment were handed over to refrigeration technicians who had successfully completed the vocational courses.

On October 6, 2021, a seminar dedicated to the World Ozone Day was held at the Kyrgyz State Technical University. The rector of the university, teachers and students of the Department of Food Engineering attended the seminar. The agenda of the seminar included such topics as the protection of the ozone layer, the Montreal Protocol and the Kigali Amendment, the problem of climate change and energy efficiency in refrigeration sector, the introduction and application of a sustainable cold chain in the food industry and in the transportation of vaccines. Participants were encouraged to choose energy

efficient refrigeration equipment working on natural refrigerants. After the seminar, 10 sets of special technical equipment were handed over to the Department of Food Engineering for conducting practical exercises in the best practice of servicing refrigeration equipment.

In 2021 the following literature was developed, published for technicians of the refrigeration sector and representatives of various organizations and government bodies:

1. Manual for the maintenance of refrigeration systems – 200 copies
2. Poster «Climate-friendly and energy efficient cooling» – 30 copies
3. Developed and printed Guidelines for calculating the energy efficiency of refrigeration and air conditioning equipment – 200 copies
4. Leaflets “A customs officers quick tool for ODS screening” – 300 copies
5. Brochure "The Montreal Protocol and the Sustainable Development Goals" in Russian language - 200 copies
6. Brochure "The Montreal Protocol and the Sustainable Development Goals" in Kyrgyz language - 200 copies
7. Poster "International Day for the Preservation of the Ozone Layer" - 20 copies
8. Guidelines for the use of propane in refrigeration equipment and air conditioners - 300 copies.
9. Installation and service when handling hydrocarbon refrigerants - 300 copies.
10. Cold chain technology brief: vaccines - 200 copies
11. Short Guide for Handling Flammable Refrigerants - 300 copies

List of official letters for the reporting period

1. Letter to the State Customs Service on reporting on the import of ODS and their substitutes HCFC HFCs and natural refrigerants for 2020.
2. Letters to the organizations Buudan LLC, Storozhenko PE, Ovsyannikova PE Promkholod LLC, KaribeYug LLC, CJSC Shoro, Samsung Service LLC, OJSC Rembytteknika, PE Podkopaev, Lotar LLC, Vinterlux LLC, Ntek LLC, PE Ovsyannikova, China Petrol Company Junda LLC, Grant Profit Group LLC, CJSC Arpa named after N. Urmanbetova, Riman Company LLC and Rempromkholod LLC about reporting on the import of ODS, HCFCs, HFCs and natural refrigerants and blowing agents in 2020.
3. Letters to the State Agency on Environment Protection, the State Customs Service and the Ministry of Economy and Finance. The letter inform that the Eurasian Economic Commission made a decision No. 30, dated March 16, 2021, on amending section 2.1 of the list of goods in respect of which the authorization procedure for import/export to the territory of Eurasian Economic Union is established, and that this decision entered into the force April 18, 2021.
4. Letter to the State Customs Service that it is necessary to develop a mechanism for importers/exporters to submit conclusions (permits) for the import/export of ozone-depleting substances, their substitutes and products containing or based on their use.

5. A letter from the State Customs Service on the need for in-depth practical training for customs officers at checkpoints in connection with the entry into force of Decision No. 30 of the Eurasian Economic Commission.

The international cooperation

January 20, 2021 ECA meeting on standards on flammable refrigerants, refrigerant specifications and technicians competencies. The agenda covered topics like Standards on refrigerant specifications, Climate relevance of the commercial refrigeration sector, flammable refrigerant charge limits in the commercial sector and certification and registration of RAC technicians.

February 10, 2021 ECA meeting on electronic databases and equipment logbooks. The meeting covered topics like Electronic databases and equipment logbooks in Poland, Internal database of NOU North Macedonia. Brainstorming on ECA network activities in 2021 and discussion of future topics of ECA meetings was performed.

February 24, 2021 ECA meeting on ECA network activities in 2021 and contingency planning of Fund Secretariat and Ozone Secretariat meetings. Agenda of the meeting included overview of possible network activities in 2021, brainstorming and discussion and Executive Committee related discussion

March 10, 2021 ECA meeting on interlinkages between the Kigali Amendment and the Paris Agreement, the agenda included overview of the Paris Agreement, Interlinkages between Kigali Amendment, Paris Agreement and sustainable development goals and national cooling strategies, national determined contributions, financing mechanisms, labelling and market transformation. Countries did presentations on interlinkages between Kigali Amendment and Paris Agreement, national climate and energy or cooling strategies.

April 14, 2021, ECA meeting on recovery, recycling, reclaim and destruction of ODS/HFCs. Invited experts presented the operation of recovery, recycling and reclaim, destruction of ODS and HFCs centers. The presentation on experience on ODS/HFC destruction in Poland were made. The international experience of UNIDO, GIZ Proklima and Daikin from RRR and destruction projects were presented and discussed.

May 12, 2021, ECA meeting on HFC freeze and phase-down strategy preparation. Participants discussed strategy elements to be considered when preparing HFC phase-down plans. The representative of the Fund Secretariat explained the main approaches and concepts on the integrated implementation of HCFC phase-out and HFC phase-down projects and on potential strategies for the HFC phase-down. UNEP Energy presented how national cooling action plans could connect the HCFC phase-out and HFC-phase-down with climate action under the Paris Agreement and progress on the SDGs.

June 9, 2021 ECA meeting on national cooling action plans and highlights from network countries. UNEP Energy presented how national cooling action plans could connect the HCFC phase-out and HFC-phase-down with climate action under the Paris Agreement and progress on the SDGs. ECA countries shared highlights of Montreal Protocol implementation in their countries. Participants discussed on World Refrigeration Day and World Ozone Day activities.

June 30, 2021 Asia and The Pacific National Cooling Action Plans workshop. Participants discussed how to develop and implement National Cooling Action Plans including challenges, opportunities and solutions, and to identify short-term regional priority activities for implementation.

Agenda included topics like Linking NCAP with the Montreal Protocol, synergizing NCAPs with HFC Phase Out activities and mainstreaming the National Cooling Plans into National Strategies.

12-13 July 2021 Pathways to Resilient Zero Carbon Cities Agenda included topics like Optimization Bundle Paths of Building Envelope for Zero Carbon Strategies, A Systemic perspective for a Resilient Net Zero Future, Reducing embodied emissions with construction from hemp-lime bio-composite material. Urban Solutions, Building Solutions, Strategic Solutions, Resilience Solutions in achieving zero emissions in cities were discussed during the conference.

14-17 July 2021 43rd Meeting of the Open-ended Working Group of the Parties to the Montreal Protocol (OEWG 43). Participants discussed the impact of the unexpected emissions of CFC-11, focused on new information related to energy efficiency and low-GWP technologies. The SAP provided a brief relating to the identification of gaps in the atmospheric monitoring of controlled substances. TEAP presented updated Energy Efficiency Report for May 2021. The technical meeting focused on the reports of the SAP and TEAP with a session for questions and answers, and general statements.

15 July 2021 As part of UNEP's 43rd Meeting of the Working Parties to the Montreal Protocol, the European Partnership for Energy and the Environment (EPEE) event "New Modeling to Support Governments in Identifying How Energy and Resource Efficiency Can Be Saved While Reducing the Consumption of HFCs".

27 July 2021 UNEP Cool Coalition webinar "Powering Sustainable Cold Chain Solutions". UNEP Cool Coalition presented opportunities for countries to scale up action on sustainable cold chains and case on best practices.

31 August 2021 Regional NCAP Capacity Building Workshop Delivering Energy Efficient and Climate Friendly Cooling through National Cooling Action Plans. The virtual workshop linked policymakers with experts to discuss how to develop and implement NCAPs. The discussion included lessons learned by countries in the region, challenges and opportunities for action, as well as short-term regional priority activities for NCAP implementation.

1 September 2021 ECA meeting on holistic approach to sustainable cooling transition (UNDP project)/roundtable discussion. UNDP presented recently approved project on cooling efficiency in the context of the Kigali Amendment. ECA network and associated CEIT countries shared information on their recent activities related to HCFC phase-out, HFC phase-down, HFC preparatory projects and World Ozone Day activities

20 September 2021, OzonAction, the Secretariat of the Basel Convention and WCO a joint briefing for Montreal Protocol Officers and the Parties of the Basel Convention on Operation Demeter VII. Participants learnt about Operation Demeter VII, and how it would serve to the further monitoring of cross-border movements of wastes covered by the Basel Convention and substances controlled by the Montreal Protocol.

September 20, 2021, Online UN Food System Summit Independent Dialogue on Sustainable Cold Chains. There was an independent dialogue on Sustainable Cold Chains and the Rome Declaration: Delivering Efficient Ozone and Climate-Friendly Cold Chains to Ensure Nutritious and Healthy Food for All. Participants discussed critical role of sustainable cold chains in providing food safety and security, preventing food loss and waste, reducing global warming and preventing the depletion of the ozone layer. It was demonstrated how the Montreal Protocol, Kigali Amendment and the Rome Declaration could contribute to scaling up technological and policy solutions.

October 6, 2021 The ECA meeting focused on the current and future monitoring and evaluation work under the Multilateral Fund. The meeting provided the opportunity to continue the dialog on HCFC phase-out, HFC phase-down and HFC preparatory projects, World Ozone Day activities, future

network activities, regional initiatives and any need for assistance. Representatives of countries shared their news, insights and highlights about their activities. Evaluation and Monitoring Office of the Multilateral Fund Secretariat presented the concept of monitoring and evaluation and how it was applied to the Montreal Protocol.

23–29 October 2021 Combined twelfth meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer and the Thirty-Third Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer Online. Meeting included financial reports and budgets of the trust funds for the Vienna Convention and the Montreal Protocol, participants discussed energy-efficient and low-global-warming-potential technologies, the membership of Montreal Protocol bodies for 2022, and report of the eleventh meeting of the Ozone Research Managers of the Parties to the Vienna Convention.

10 November 2021 ECA meeting on banning non-refillable refrigerant containers and briefing by ECA network and associated CEIT countries (continued). During the meeting Montreal Protocol experts and the representative of the World Customs Organization shared their experiences and view on banning non-refillable containers to prevent illegal trade and to avoid refrigerant emissions. Countries shared information on recent activities related to HCFC phase-out, HFC phase-down, HFC preparatory projects and World Ozone Day activities.

8 December 2021 ECA meeting on collecting substance and equipment data for KIP preparation, and briefing on country highlights. During the meeting, invited experts from Bosnia and Herzegovina, Croatia, Serbia and UNEP OzonAction shared their experiences on how to collect or estimate data related to controlled substances/alternatives, and equipment containing them. Network countries shared country highlights and information on recent activities related to HCFC phase-out, HFC phase-down, HFC preparatory projects, World Ozone Day activities etc.

Cooperation with local government bodies

On May 27, 2021, the Ozone Center organized and conducted a kick-off workshop on the project “Capacity development and technology transfer to improve the generation and use of data and information to facilitate environmental monitoring in Central Asia” on the implementation of GIS systems. A project on development of a digital geographic atlas and ways to implement it were presented. In 2021, 2 online trainings on satellite environmental monitoring were held for 15 people, all of them received MSU certificates. Currently, the Ozone Center is negotiating the financial articles of the draft Agreement on this project between UNEP and the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic.

June 15, 2021 representatives of the Ozone Center organized and held a kick-off seminar on the project of non-thermal treatment of waste containing DDT in the countries of Central Asia (Kyrgyz Republic and Tajikistan), where a project for the disposal of DDT was presented and issues related to the implementation of this project were discussed. Visits of experts to the DDT burial grounds in the Suzak district of the Jalal-Abad region were organized, meetings were held with the leadership of the Jalal-Abad region on the problems of project implementation. At the moment, UNEP and the Ozone Center are working to clarify the financial statements of the Grant Agreement.

On July 9-11, 2021, The Ozone Center organized and held a round table on the development and discussion of the draft Concept of Environmental Security of the Kyrgyz Republic until 2030 with the participation of the expert community and the leadership of the Ministry of Natural Resources,

Ecology and Technical Supervision of the Kyrgyz Republic. The developed concept of environmental safety was sent for consideration to the Presidential Administration.

Report on the Vienna Convention for the Protection of the Ozone Layer.

During the reporting period (2021), the research work **“Variability of the ozone layer, ground ultraviolet radiation and aerosol optical depth in the atmosphere of Central Asia”** was completed. The research topics correspond to the priority areas for science and technology development in the Kyrgyz Republic for 2021-2023 "Problems of ecology and biotechnology, biological safety and climate change-related research", as well as areas of research under the UN Environment Programs (UNEP), the World Meteorological Organization (WMO), the Paris Agreement on the UN Convention on Climate Change. The research work was funded on a competitive basis by the Ministry of Education and Science of the Kyrgyz Republic. The Institute of Innovative Professions (IIP), KGUSTA, implemented the project “Technical support for equipping the Issyk-Kul OMD station, Kyrgyzstan, with modern measuring equipment for monitoring the ozone layer in the atmosphere of the mountainous region of Central Asia” based on an agreement between IIP and the World Meteorological Organization (WMO).

During the implementation of the project, the following works were performed:

1. An observation site for the Brewer MKIV spectrophotometer, as well as rooms for the placement of related equipment, consumables, spare parts, diagnostics and repair tools necessary for the operation of the spectrophotometer and accommodation for maintenance personnel have been prepared at the Issyk-Kul OMD station.
2. Financial, logistical and customs procedures for the shipping of the Brewer MKIV spectrophotometer and additional equipment from Canada to the territory of Kyrgyzstan have been completed.
3. Brewer MKIV spectrophotometer and additional equipment were sent from the customs zone to Issyk-Kul station.
4. A financial and technical agreement has been concluded with an external expert for the installation, configuration and commissioning of the Brewer MKIV spectrophotometer, as well as for the training of local personnel.
5. Assembly, installation, adjustment, testing, commissioning of the spectrophotometer and training of the station personnel were carried out in November and December 2021 with the online participation of an expert from Canada, due to the pandemic, his arrival in Kyrgyzstan was impossible.
6. Currently, on the basis of the Brewer MKIV spectrophotometer installed at the Issyk-Kul OMD station, measurements of the total ozone content and UV-B radiation are carried out, data is processed and automatically transmitted to WOUDC (www.woudc.org), as well as to the ECCC global ozone monitoring and mapping service (Fig. 1). <https://exp-studies.tor.ec.gc.ca/e/ozone/ozoneworld.htm>.

Ground-based TO measurements at the Issyk-Kul OMD station are used to validate satellite TO measurements

The research results were presented in the 11-ORM organized by UNEP, WMO. The scientific supervisor Orozaliev M.D. took part at the 11-ORM meeting (Geneva, 2021) as a representative of the Kyrgyz Republic. The recommendations of the Kyrgyz side on the priority of expanding and resuming experimental studies of the ozone layer and climate variability in the mountainous regions of Central Asia and the Himalayas using modern measuring equipment were included in the adopted final and program documents of 11-ORM.

Research results published:

1. Toktomyshev S.Zh., Amanaliev M.K., Orozaliev M.D., Zhumabekov A.A. Is the ozone layer of the atmosphere recovering over the mountainous region of Central Asia. Proceedings of the National Academy of Sciences of the Kyrgyz Republic, No. 1-c. 31-43, 2021.
2. Orozaliev M.D., Abdylbaev A.S., Zhumabekov A.A. Variability of the total ozone and other climatically active atmospheric impurities based on the results of 40 years experimental studies at the Issyk-Kul scientific station (42.62 N; 76.98 E; 1640m). VII International Scientific and Practical Network Conference "Integration Processes in the Scientific, Technical and Educational Space" 2021.
3. Toktomyshev S.Zh., Orozaliev M.D. The state of the ozone layer and climate variability in the mountainous region of Central Asia. Reports of the National Academy of Sciences of the Kyrgyz Republic, (materials of the conference "Mountains and Climate"). 2022, in press.
4. Moldotashev I.K., Taalaibekova T.T., Kudaibergenova N.T., Orozaliev M.D., Usulaliev N.N., Kydyralieva R.B. Zeitschrift für Gefäßmedizin 2021; 18 (4), 10-14.
5. Orozaliev M.D., Amanaliev M.K., Abdylbaev A.S., Zhumabekov A.A. / Long term monitoring (40 years) of ozone and other climate active impurities in the atmosphere of mountainous region of Central Asia (Kyrgyzstan)/ WMO Global Ozone Research and Monitoring Project, Report, 2021.
6. Orozaliev M.D., Abdylbaev A.S., Zhumabekov A.A. /Variability of climatically active atmospheric impurities based on the results of 40 years of observation on the basis of the Issyk-Kul research station (42.62N; 76.98E; 1640M) and on satellites (sbuv) / NEWS KSUCTA №3, 2021.
7. NASA, US, www.aeronet.gsfc.nasa.gov, Aeronet – Issyk-Kyl (aerosols);
8. Торонто, Канада, www.woudc.org, Woudc - ISK № 347 (ozone);
9. NOAA, US, www.ndsc.ncep.noaa.gov NDACC - Issyk-Kyl; (nitrogen dioxide)
10. Токио, Япония, www.ds.data.jma.go.jp. NOO WDCGG - ISK 242 (green house gases);
11. Канада, ECCC <https://exp-studies.tor.ec.gc.ca/e/ozone/ozoneworld.htm>, (ozone).

The obtained experimental data on temporal variations of the ozone layer and climatically active components of the atmosphere over the mountainous regions of Central Asia are necessary for:

- update of databases of world centers: on ozone (Issyk-Kul № 347- Woudc, www.woudc.org); on green house gases (ISK 242 NOO WDCGG, www.ds.data.jma.go.jp); on nitrogen dioxide (NDACC - Issyk-Kul, www.ndsc.ncep.noaa.gov); and on aerosols (NASA, Aeronet–Issyk-Kul, www.aeronet.gsfc.nasa.gov);
- development and correction of models for forecasting the state of the ozone layer and climate in conditions of rapidly changing anthropogenic, solar- and geophysical processes;
- benchmarking and validation of satellite measurements;
- development and adoption of strategic programs and recommendations to protect the ozone layer and climate change mitigation by international organizations (UNEP, WMO, etc.) and governmental agencies of the Kyrgyz Republic
- development of strategic programs by the state structures of the Kyrgyz Republic for sustainable development of the economy, plans and measures for food and energy security, for solving environmental problems, for preventing and reducing damage from emergencies and disasters associated with abnormal changes in the ozone layer, weather and climate.

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 2020 were sent to the Multilateral Fund of the Montreal Protocol in April 2021. Reports on the activities of the Ozone Center were sent to the UNEP Division of Technology, Industry and Energy in January 2021. Reports on the progress of the implementation of

the HPMP in 2020 and financial reports were sent to UNDP in January 2021. The Article 7 report was sent to the Montreal Protocol Secretariat on July 27, 2021.

In 2021, there was conducted updating and replenishment with thematic information the following sites: www.climate.kg, www.ozonecenter.kg, www.ecoholod.com.kg. These websites are regularly updated as soon as new information appears.

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

- <http://ozonecenter.kg/en/respublikanskoe-obshhestvennoe-obedinenie-ekoholod-provelo-xv-sezd-speczialistov-holodilnoj-otrasli-kyrgyzskoj-respubliki/>
- http://www.climate.kg/index.php?option=com_content&view=article&id=230:-lr-xiv-&catid=2:2012-06-07-00-42-07&Itemid=20&lang=en
- <http://www.ecoholod.com.kg/?p=616>
- <https://www.youtube.com/watch?v=zki6bEVdwpk&feature=youtu.be>
- https://bilim.akipress.org/unews/un_post:22626/?from=bilim&place=main-last
- On June 5, 2021, a talk show "June 5 World Environment Day" was shown in the Kyrgyz language on the ElTR channel.
- On June 29, 2021, a film about the activities of the Ozone Unit was shown on the KTRK channel in Russian with English subtitles.
- On September 13, 2021, representatives of the Ozone Unit gave an interview about September 16, World Ozone Day and Sustainable Cold Chains on Radio "Okay".
- On September 15, 2021, a film about the activities of the Ozone Unit in Kyrgyzstan and its achievements in ODS regulation was broadcasted on the KTRK channel, dedicated to the World Ozone Day
- <http://ekois.net/vosstanovlenie-ozonovogo-sloya-s-pomoshhyu-diplomatii/>
- <https://slovo.kg/?p=122361>

Head of NOU



Mars Amanaliev