WORKSHOP REPORT

Train-the-Trainers Workshop on Good Practices in Refrigeration and Recovery and Recycling

GEORGIA

United Nations Environment Programme (UNEP)
Division of Technology, Industry and Economics (DTIE)
OzonAction Programme

Multilateral Fund for the Implementation of the Montreal Protocol

Tbilisi, Georgia, 14 – 18 February 2000
WORKSHOP REPORT

Train-the-Trainers Workshop on Good Practices in Refrigeration and Recovery and Recycling

GEORGIA

organised by:

United Nations Environment Programme (UNEP)
Division of Technology, Industry and Economics (DTIE)
OzonAction Programme

and

The National Ozone Unit of the Ministry of Environment of Georgia

funded under the

Multilateral Fund for the Implementation of the Montreal Protocol

Tbilisi, Georgia, 14 – 18 February 2000
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Executive Summary

The Implementation of a Train-the-Trainers Workshop on Good Practices in Refrigeration and Recovery and Recycling in Georgia was approved at the 23rd meeting of the Executive Committee of the Multilateral Fund. The project is being implemented by UNEP in cooperation with the National Ozone Unit of the Ministry of Environment of Georgia.

This training program is part of a comprehensive approach to reduce the ODS (Ozone Depletion Substances) consumption in the refrigeration / air-conditioning servicing and in the agricultural sector. Such approach is being finalised the Refrigerant Management Plan (RMP) that is being developed for Georgia and which is expected to be operational at the end of the year 1999.

The aim of this program is to implement a comprehensive training program for good servicing practices and recovery and recycling of refrigerants in the refrigeration and air-conditioning sectors.

The training program will provide recovery and recycling equipment and should establish a recycling network operated by the Ministry of Environment of Georgia to collect polluted refrigerants and lubricants as well for final disposal. A monitoring system (as part of the operations of the national Ozone Unit) will report the quantities of recycled refrigerants and should be established by the national Ozone Unit. The national Ozone Unit will issue recommendations on further national requirements for recovery and recycling too. Tbilisi State Technical University and Kutaisi State Technical University will include a refrigerant recovery / recycling and good practice course in its regular lessons.

As part of this training program a five-day train-the-trainers workshop was organised in Tbilisi from 14 to 18 of February 2000. A UNEP international consultant on Good Practices in Refrigeration and Recovery and Recycling from the “Bundesfachschule for Refrigeration & Air-Conditioning, Maintal, Germany” served as lead instructor and co-ordinator of the workshop.

At the workshop 11 professionals from Georgia were trained (the list of participants in Annex 10.2).

Additional workshops are planed by the local trainers to train further trainers and technicians in the major cities of Georgia: Tbilisi, Kutaisi, Batumi, Telavi.

The workshop included lectures on harmful effects of Ozone Layer Depletion, related international agreements etc., as well as lectures on CFC refrigerants, lubricants, different kind of equipment, good practices and maintenance, recovery and recycling of refrigerants. Lectures on non-CFC refrigerants, retrofitting and envisioned future technological development in the field of the refrigeration sector were also included.

Hands-on demonstrations with recovering and recycling equipment, using actual commercial refrigeration units in need of recover, repair and recharge incl. maintenance were conducted during the training course.

To show the participants how to build a low cost recovery unit with local available parts, different mechanical and electric circuit diagrams were distributed, and the constructions were discussed during the sessions.

The now 11 trained trainers received the necessary knowledge in order to train other trainers and technicians working with them at their respective workshop in the use of good practices and how to recover and recycle used refrigerants. All the planed training centres will receive
a complete set of tools and recovering / recycling equipment being purchased in the framework of the project.

At the end of the workshop time was allocated for discussions between the participants, the international consultant and the representatives of UNEP and the national Ozone Unit.

1. Background

The Country Programme of Georgia was compiled with the support of UNEP DTIE and approved by the Executive Committee in. According to the Country Programme the total ODS consumption in Georgia is 25.95 ODP tons, of which 23.48 tons are used in the maintenance and repair of refrigeration and air-conditioning equipment, and 2.47 tons as fire extinguishing agents, agricultural use etc.

The total number of commercial refrigeration units in restaurants, supermarkets etc. is about 5000, using mainly CFC 12 as refrigerant. 25 large air-conditioning units are in use to air-condition large buildings like the central TV station, theatre in Tbilisi and several hotels.

The Implementation of a Train-the-Trainers Workshop on Good Practices in Refrigeration and Recovery and Recycling in Georgia was approved at the 23rd meeting of the Executive Committee of the Multilateral Fund. The project is being implemented by UNEP in cooperation with the National Ozone Unit of the Ministry of Environment of Georgia. The training program is designed for Georgian technicians to improve their working practices while performing service and maintenance in the refrigeration and air-conditioning sector.

The Government of Georgia is defining a comprehensive approach to reduce the ODS consumption in refrigeration / air-conditioning sector. This approach is being defined in the Refrigerant Management Plan (RMP) being developed for Georgia which is expected to be operational in the second half of 1999. This training program on good practices in refrigeration and recovery and recycling is a part of such RMP.

2. Objectives

The main objective of this project is to assist the refrigeration / air-conditioning sector industries of Georgia to comply with the accelerated phase-out schedule as set in the country program approved by the Executive Committee of the Multilateral Fund.

The project targets to train 300 refrigeration - and air-conditioning technicians employed by different refrigeration and air-conditioning companies in the entire country of Georgia.

The trainers will assume a role of foremen and quality assurance experts for their employees ensuring that good maintenance standards and practices will be followed. They are also supposed to promote the introduction of non-CFC equipment and technology. The recovery and recycling equipment to be procured will also be applicable for non-CFC equipment.

3. Expected Results

The long term expected result of the training program is to enhance good service and business practices in the refrigeration sector assisting the sector to switch over to non-CFC equipment by the year 2002 without causing an unnecessary burden to Georgian consumers.

The main expected results are the following:
• Minimisation and elimination of uncontrolled emissions of Ozone Depleting Refrigerants through better maintenance practices and ODS recovery and recycling by training refrigeration service technicians.

• Creation of a recycling network to run by the Georgian refrigeration sector companies.

• A monitoring system (being a part in the operation of the National Ozone Unit) covering the quantities of refrigerants recycled will be established by the Government of Georgia (Ministry of Environment) which also will issue recommendations on recovery and recycling of refrigerants.

• Increased usage of non-CFC equipment and technology and non-ODS coolants.

• Reduction of the annual consumption of CFC 11, 12, 502, Methyl Bromide etc.

• Incorporation of a Montreal Protocol related refrigerant recovery, recycling and good practices training module in the curricula of the Technical University of Georgia and other training centres to ensure that all technicians do not need re-training on this aspect in the future.

• Ensure follow-up and strengthening of joint initiatives between the Government of Georgia and the refrigeration / air-conditioning sector of Georgia concerning training programmes on good practices in refrigeration and recovery and recycling.

Dissemination of general information of the harmful effects of ODS can be enhanced through the project, since its implementation is closely related to the Institutional Strengthening Project.

4. Participants

At the end of the workshop 11 professionals of the planned 30 professionals of the refrigeration sector were trained as trainers. It has been proposed to organise additional 10 workshops to train the rest of the experts and trainers.

The participants to the workshop came from the following institutions:

• Tbilisi State Technical University
• Technical University of Batumi
• Kutaisi State Technical University
• Georgian Refrigeration Association
• Department of Industry and Food Products
• Members of Research Institute, Tbilisi

A detailed list of the participants is included as annex 10.2
5. Methodology

As part of this training program a five-day workshop to train-the-trainers was organised in Tbilisi, Georgia, from 14. to 18. February 2000. A UNEP international consultant on Good Practices in Refrigeration and Recovery and Recycling served as lead instructor and co-ordinator of the workshop. He was assisted by a member of the Research Institute of Tbilisi and the NOU to manage and organise the sessions.

During the workshop the UNEP’s training manual on “Good Practices in Refrigeration” as well as different publications and slides were used as resource documents. The workshop consisted of both theoretical and practical “hands-on” demonstrations.

6. Content

The workshop included lectures on the harmful effects of Ozone Layer Depletion, related international agreements etc., as well as lectures on CFC-refrigerants, different kind of equipment, good maintenance practices, recovery and recycling of refrigerants, handling of used (polluted) compressor oils. Lectures on non-CFC refrigerants, retrofitting possibilities and envisioned future technological development on refrigeration / air-conditioning sector were also included.

Hands-on demonstrations with recovery and recycling equipment using actual refrigeration units in need of recover, repair, evacuate, recharge and set into operation were conducted during the training sessions. The usage of dried Nitrogen ($N_2$) as a protective gas during soldering of cooper tubes to prevent built up oxides inside the tubes was shown and discussed with the participants.

Proper handling of tools especially for the use in the field of refrigeration and air-conditioning was also an important part of the lectures.

The participants were also shown how to build a recovery unit with local available parts in order to lower the cost of necessary recovering / recycling units. Different mechanical and electrical diagrams were distributed and discussed.

At the end of the workshop an examination of the participants took place. All of the 11 participants passed the examination and received an official “Certificate of Participation” and a Diploma which certifies them to train other technicians and to work with ODS or ODS-containing substances.

Time was also allocated for discussions among the participants concerning suggested elements in the legislation regulating ODS that is being developed by the Ministry of Environment.

A detailed agenda of the workshop is included in annex 10.1

7. Results, Conclusions, Recommendations and Lessons learned.

The 11 trainers received the necessary knowledge in order to train the technicians working with them at their respective workshops in the use of good practices and on how to recover and recycle refrigerants. The Training centres and recovery centres will receive a set of the necessary equipment to recover and recycle refrigerants. The equipment has been purchased in the framework of the project already.
Recommendations:

- An additional workshop should be organised by the National Ozone Unit (NOU) in order to train 14 additional trainers soon.
- The RMP for Georgia should include among its activities the establishment of an import / export licensing system and of a certification system for technicians of the refrigeration / air-conditioning sector.
- The NOU should try to establish some collecting points for polluted (mixed) refrigerants and for used compressor oils to store them until there will be a final solution for their disposal in the near future.

Conclusions and Recommendations by the participants

The participants to the Train-the-Trainers Workshop on Good Practices in Refrigeration and Recovery and Recycling have agreed upon the following:

1. In order to ensure the total phase-out of CFCs in the refrigeration servicing sector the following actions should be undertaken:
   - To begin practical actions on the base of Legislative Measures.
   - Implementation of adopted decisions and resolutions.

Specifically, should be established:
   - Certification of refrigerant technicians
   - Licensing of import and consumption

In addition:
   - Strict inspection and monitoring by relevant organisations
   - Active affords from Ecopolicе and other structures
   - Penal Sanctions

From the above-mentioned measures should be achieved the following:
   - Strict Inspection of import and consumption
   - elimination of contraband
   - Reduction of refrigerant import
   - Usage of recycling CFCs.

In addition:
   - To facilitate the introduction of alternative refrigerants in local industry.
   - To implement all measures provided by Refrigerant Management Plan (RMP).

2. Ozone Layer depletion issues must be included in the curriculum of all Technical Schools for refrigeration technicians. A work plan with this aim will be prepared by the department of Refrigeration of Technical University of Georgia.

3. A Code of Good Practices in refrigeration servicing must be adopted, and a system of awarding certificates to technicians must be introduced to ensure that these good practices are carried out. A work plan with this aim will be prepared by Refrigeration Union of Georgia and “Ozone Centre” of Georgia.
4. A system of quality control of refrigeration workshops must be introduced in order to monitor the implementation of the Code of Good Practices, and the reduction in the use of pure CFCs. The elements of this system are the following:

- Obligatory re-training of all refrigeration technicians
- Monitoring
- Periodical inspections
- Introduction of mechanism of certification in order to eliminate the access of non-professionals to refrigerants
- To strengthening of Legislation
- Control
- To supply workshops with perfect technique

5. The sufficient work plan will be established by Mr. Sulkhan Suladze, President of Refrigerant Technicians Associations of Georgia.

6. Some elements have been put in place for the training of the remaining technicians on the training programme. These are: the agenda, the training material, the duration and the logistical organization of the lessons, the trainers and the work plan. The training programmes will be completed by December 2000.

8. Follow-up Action Plan

- These workshops are part of the RMP being drafted for Georgia. As such it will be followed by other activities defined within the RMP to be implemented by the NOU that will ensure the up-hold of good servicing in refrigeration and the follow-up and strengthening of the phase-out process of ODS.

- Additional workshops will be organised by the NOU in order to train further trainers and technicians.

- Following the workshops the Ministry of Environment is planning to establish a certification system for technicians in the field of refrigeration and air-conditioning and an import / export licensing system for ODS and ODS containing equipment.

- The Government of Georgia will report within a year’s time on the results of the training program on good practices in refrigeration and recovery and recycling under the monitoring systems that will be established.

9. Evaluation by Participants

In general the evaluation of the training made by the participants on almost all points ranged from good to very good (see annex 10.4 Evaluation by Participants).

10. Annexes

10.1 Agenda
10.2 List of participants
10.3 List of trainers and speakers
10.4 Evaluation by participants
10.5 About OzonAction Programme UNEP DTIE
Annex 10.1 Agenda

Lead Consultant:
Mr. Berthold Schneider
Bundesfachschule Kälte-Klima-Technik (Germany)

Monday, 14 February 2000

09:30 Registration of participants

10:00 Opening session

Welcome address and chairman
Ms. Lia Todua, Ozone Officer, Ministry of the Environment and Natural Resources
Protection of Georgia

Greetings

UNEP DTIE’s OzonAction Programme and the Montreal Protocol
Mr. Heikki Willstedt, UNEP DTIE representative

10:30 Introduction of the Participants

10:50 The Montreal Protocol, (VIDEO)

11:15 Refrigerant Management Plan at national level to phase out ozone-depleting
substances (ODSs) and the train-the-technicians phase. Objective and goals of the
Training Programme.
Ms. Lia Todua, Ozone Officer

12:00 Coffee Break

12:10 Refrigerants and oils (lubricants) – new developments of alternatives for all systems,
commercial cooling, sub-cooling applications.

13:30 Discussion

14:00 Lunch

15:00 Handling of blends (azeotropic and zeotropic blends)

16:30 Coffee Break

16:45 Environmental protection, ozone depletion, greenhouse effect, CO₂ emissions, energy
consumption

17:30 Review of the day, Discussion Time

18.00 Closure of the day
Tuesday, 15 February 2000

10:30  Retrofitting-procedures (CFC’s to HFC’s and to hydrocarbons) compressor oil change, oil testing

11:45  Coffee Break

12:00  Drop-In-procedures (CFC’s to HCFC or HCFC base on blends) oil change and oil testing

13:30  Discussion

14:00  Lunch

15:00  Leakproof construction of Refrigeration cycles by flaring, soldering, brazing and welding.

16:30  Coffee Break

16:40  Leak detection with different methods, reducing of leakage rates.

17:40  Review of the day, Discussion Time

18:00  Closure of the day

Wednesday, 16 February 2000

10:30  Good practices; set into operation, pressure test, evacuation and dehydration, charging

11:45  Coffee Break

12:00  Methods of recovery and recycling.

13:30  Discussion

14:00  Lunch

15:00  Recovery and Recycling machines, how to use them properly.

16:30  Coffee Break

16:40  Recovering of liquid refrigerants. Recovering of vaporised refrigerants

17:40  Review of the day, Discussion Time

18:00  Closure of the day

Thursday, 17 February 2000

10:30  Proper handling of refrigerant cylinders, transportation of refrigerant cylinders

11:45  Coffee Break
12:00 How to protect refrigerant cylinders from overfill in case of recovering liquid of vaporised refrigerants.

13:30 Discussion

14:00 Lunch

15:00 Recycling refrigerants for re-use, acid tests.

16:30 Coffee Break

16:40 Handling of used (polluted) compressor oil.

17:40 Review of the day, Discussion Time

18:00 Closure of the day

**Friday, 18 February 2000**

10:00 Safety requirements and regulations, refrigerant standards.

11:30 Review of the day, Discussion Time

12:00 Coffee Break

12:15 Examination

14:00 Lunch

15:00 Adoption of the workshop recommendations
   Mr. Heikki Willstedt, UNEP DTIE representative

   Discussion on train-the-technicians programme
   Ms. Lia Todua, Ozone Officer, Ministry of the Environment and Natural Resources Protection of Georgia

   Evaluation of the workshop
   Workshop participants

16:30 Coffee Break

16:40 Closing session

   Distribution of certificates
   Closing statement
   Mr. Berthold Schneider, Lead consultant

   Closing statement
   Mr. Heikki Willstedt, UNEP DTIE representative

   Closing statement
   Ms. Lia Todua, Ozone Officer, Ministry of the Environment and Natural Resources Protection of Georgia

17:30 Closure of the workshop
Annex 10.2 List of Participants

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<th>TRAINEES</th>
<th>Name, Surname</th>
<th>Organization</th>
<th>Title</th>
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<tr>
<td>1</td>
<td>Tamaz Megrelidze</td>
<td>Georgian Technical University</td>
<td>Head of Chair</td>
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<tr>
<td>2</td>
<td>Konstantine Partskhaladze</td>
<td>Georgian Technical University</td>
<td>Lecturer</td>
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<td>3</td>
<td>Ramaz Zhorzholoriani</td>
<td>Department of Industry and Food Products</td>
<td>Senior Specialist</td>
</tr>
<tr>
<td>4</td>
<td>Avtandil Tvalchrelidze</td>
<td>Kutaisi Technical University</td>
<td>Head of Chair</td>
</tr>
<tr>
<td>5</td>
<td>Kakha Jachvadze</td>
<td>Georgian Technical University</td>
<td>Senior Teacher</td>
</tr>
<tr>
<td>6</td>
<td>Aleqsi Morchiladze</td>
<td>Georgian Technical University</td>
<td>Senior Teacher</td>
</tr>
<tr>
<td>7</td>
<td>Gocha Kvirkashvili</td>
<td>Georgian Technical University</td>
<td>Senior Teacher</td>
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<tr>
<td>8</td>
<td>Tamaz Isakadze</td>
<td>Telavi Branch of Georgian Technical University</td>
<td>Assistant</td>
</tr>
<tr>
<td>9</td>
<td>Boris Khutshishvili</td>
<td>Batumi Technical University</td>
<td>Assistant</td>
</tr>
<tr>
<td>10</td>
<td>Badri Nikabadze</td>
<td>Kutaisi Technical University</td>
<td>Lecturer</td>
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<tr>
<td>11</td>
<td>Davit Tsagareishvili</td>
<td>Kutaisi Technical University</td>
<td>Senior Teacher</td>
</tr>
<tr>
<td>OTHER PARTICIPANTS</td>
<td>Name, Surname</td>
<td>Organization</td>
<td>Title</td>
</tr>
<tr>
<td>12</td>
<td>Vasil Sulava</td>
<td>As &quot;Universalservise&quot;</td>
<td>Deputy director</td>
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<tr>
<td>13</td>
<td>Otar Jiantiaashvili</td>
<td>Ltd. &quot;Tecservise&quot;</td>
<td>Director</td>
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<td>14</td>
<td>Tamaz Shubitidze</td>
<td>R/R centre</td>
<td>Director</td>
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<tr>
<td>15</td>
<td>Murman Lanchava</td>
<td>As &quot;Universalservise&quot;</td>
<td>Senior engineer</td>
</tr>
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<td>16</td>
<td>Lia Todua</td>
<td>Ministry of Environment of Georgia, Main Department of Air Protection</td>
<td>Ozone Officer</td>
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<td>17</td>
<td>Heikki Willstedt</td>
<td>UNEP DTIE</td>
<td>Consultant</td>
</tr>
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<td>18</td>
<td>Berhtold Shneider</td>
<td>Bundesfachschule Kält-Technik (Germany)</td>
<td>Lead consultant</td>
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<td>19</td>
<td>Sulikhan Suladze</td>
<td>Georgian Refrigeration Association</td>
<td>President, National consultant</td>
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<td>20</td>
<td>Temur Gordeladze</td>
<td>Kutaisi Technical University</td>
<td>Vice-rector</td>
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<td>21</td>
<td>Aslan Shahverdiyev</td>
<td>State Committee on Ecology of Azerbaijan</td>
<td>Coordinator of Ozone Center</td>
</tr>
<tr>
<td>22</td>
<td>Mikheil Tushishvili</td>
<td>Ministry of Environment of Georgia, Main Department of Air Protection</td>
<td>Workshop orgcommittee</td>
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<tr>
<td>23</td>
<td>Tamar Tsitsqishvili</td>
<td>Workshop orgcommittee</td>
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<tr>
<td>24</td>
<td>Nino Tchanturishvili</td>
<td>Workshop orgcommittee</td>
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Annex 10.3 List of Trainers & Speakers

Mr. Berthold Schneider  
Lead Consultant  
Bundesfachschule Kälte-Klima-Technik

Ms. Lia Todua  
Ozone Officer,  
Ministry of the Environment and  
Natural Resources Protection of Georgia

Mr. Heikki Willstedt  
UNEP DTIE representative  
UNEP DTIE’s OzonAction Programme
Annex 10.4 Evaluation by Participants

Evaluation results

The Participants completed the evaluation forms according to the following grades and percentage:

1. What is your overall evaluation of the course?
   4.7

2. Did the course provide the information you expected?
   4.2

3. Was the communication between participants possible and useful?
   5

4. Was the composition of the audience adequate?
   4.6

5. As far as the contents of the presentation are concerned, did you find them adequate in explaining:
   a) Environmental issues
      4.9
   b) Basic principles of refrigeration
      4.6
   c) CFC/HFC/HFC/HC refrigerants and technologies
      4.8
   d) General trade safety
      4.9
   e) Operation and use of trade specialty tools
      4.6
   f) Operation and use of passive and active recovery devices
      3.8
   g) Good refrigeration practices
      4.2
   h) Retrofitting to alternative refrigerants
      4.4
   i) Creating preventive maintenance programs and record-keeping
      4.2
   j) RMP concept at company level
      4.1
6. Has the recovery issue been adequately dealt with in the practical hands-on sessions?
   \[4,4\]

7. Did the training course provide you with relevant information regarding the Refrigerant Management Plan in your country?
   \[4,2\]

8. Did the training course provide you with the relevant information regarding the train-the-technicians phase and your role in it?
   \[4,5\]

9. Did the training course provide appropriate training material as a basis for the train-the-technicians phase to be carried out by yourself in your country (please indicate under 11 whether additional material could be useful)?
   \[4,7\]

10. Please give additional comments about the quality of the course and how similar courses could be improved:

    - the impression is good. We received lot of information about new refrigerants, oils and generally, about refrigeration technologies
    - it would be desirable in the future if more time was spent on practical part and experience of developed countries was fully discussed
    - more attention should be given to recommendations about the devices existing in the country. More attention should be paid to modern methods and means for control of parameters and regulation of processes in refrigeration equipment
    - the workshop was very useful taking into consideration that such kind of workshop was held for the first time in Tbilisi.
    - it would be desirable to hold the similar workshops in the future
Annex 10.5 About the OzonAction Programme UNEP DTIE

Nations around the world are taking concrete actions to reduce and eliminate production and consumption of CFCs, halons, carbon tetrachloride, methyl chloriform, methyl bromide and HFCFCs. When released into the atmosphere these substances damage the stratospheric ozone layer — a shield that protects life on Earth from the dangerous effects of solar ultraviolet radiation. Nearly every country in the world — currently 183 countries — has committed itself under the Montreal Protocol to phase out the use and production of ODS. Recognizing that developing countries require special technical and financial assistance in order to meet their commitments under the Montreal Protocol, the Parties established the Multilateral Fund and requested UNEP, along with UNDP, UNIDO and the World Bank, to provide the necessary support. In addition, UNEP supports ozone protection activities in Countries with Economies in Transition (CEITs) as an implementing agency of the Global Environment Facility (GEF).

Since 1991, the UNEP DTIE OzonAction Programme has strengthened the capacity of governments (particularly National Ozone Units or “NOUs”) and industry in developing countries to make informed decisions about technology choices and to develop the policies required to implement the Montreal Protocol. By delivering the following services to developing countries, tailored to their individual needs, the OzonAction Programme has helped promote cost-effective phase-out activities at the national and regional levels:

Information Exchange
Provides information tools and services to encourage and enable decision makers to make informed decisions on policies and investments required to phase out ODS. Since 1991, the Programme has developed and disseminated to NOUs over 100 individual publications, videos, and databases that include public awareness materials, a quarterly newsletter, a web site, sector-specific technical publications for identifying and selecting alternative technologies and guidelines to help governments establish policies and regulations.

Training
Builds the capacity of policy makers, customs officials and local industry to implement national ODS phase-out activities. The Programme promotes the involvement of local experts from industry and academia in training workshops and brings together local stakeholders with experts from the global ozone protection community. UNEP conducts training at the regional level and also supports national training activities (including providing training manuals and other materials).

Networking
Provides a regular forum for officers in NOUs to meet to exchange experiences, develop skills, and share knowledge and ideas with counterparts from both developing and developed countries. Networking helps ensure that NOUs have the information, skills and contacts required for managing national ODS phase-out activities successfully. UNEP currently operates 8 regional/sub-regional Networks involving 114 developing and 9 developed countries, which have resulted in member countries taking early steps to implement the Montreal Protocol.

Refrigerant Management Plans (RMPs)
Provide countries with an integrated, cost-effective strategy for ODS phase-out in the refrigeration and air conditioning sectors. RMPs have to assist developing countries (especially those that consume low volumes of ODS) to overcome the numerous obstacles to phase out ODS in the critical refrigeration sector. UNEP DTIE is currently providing specific expertise, information and guidance to support the development of RMPs in 60 countries.

Country Programmes and Institutional Strengthening
Support the development and implementation of national ODS phase-out strategies especially for low-volume ODS-consuming countries. The Programme is currently assisting 90 countries to develop their Country Programmes and 76 countries to implement their Institutional-Strengthening projects.

For more information please contact:

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About the UNEP Division of Technology, Industry and Economics

The mission of the UNEP Division of Technology, Industry and Economics is to help decision-makers in government, local authorities, and industry develop and adopt policies and practices that:

- are cleaner and safer;
- make efficient use of natural resources;
- ensure adequate management of chemicals;
- incorporate environmental costs;
- reduce pollution and risks for humans and the environment.

The UNEP Division of Technology, Industry and Economics (UNEP DTIE), with the Division Office in Paris, is composed of one centre and five branches:

/ The International Environmental Technology Centre (Osaka), which promotes the adoption and use of environmentally sound technologies with a focus on the environmental management of cities and freshwater basins, in developing countries and countries in transition.

/ Production and Consumption (Paris), which fosters the development of cleaner and safer production and consumption patterns that lead to increased efficiency in the use of natural resources and reductions in pollution.

/ Chemicals (Geneva), which promotes sustainable development by catalysing global actions and building national capacities for the sound management of chemicals and the improvement of chemical safety world-wide, with a priority on Persistent Organic Pollutants (POPs) and Prior Informed Consent (PIC, jointly with FAO).

/ Energy and OzonAction (Paris), which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition, and promotes good management practices and use of energy, with a focus on atmospheric impacts. The UNEP/RISØ Collaborating Centre on Energy and Environment supports the work of the Branch.

/ Economics and Trade (Geneva), which promotes the use and application of assessment and incentive tools for environmental policy and helps improve the understanding of linkages between trade and environment and the role of financial institutions in promoting sustainable development.

/ Coordination of Regional Activities Branch (Paris), which coordinates regional delivery of UNEP DTIE’s activities and ensures coordination of DTIE’s activities funded by the Global Environment Facility (GEF).

UNEP DTIE activities focus on raising awareness, improving the transfer of information, building capacity, fostering technology cooperation, partnerships and transfer, improving understanding of environmental impacts of trade issues, promoting integration of environmental considerations into economic policies, and catalysing global chemical safety.