

Workshop Report

Train-the-Trainers Workshop on Good Practices in Refrigeration Belize



Environment Environnement
Canada Canada



**Division of Technology, Industry and Economics
OzonAction Programme**



**Multilateral Fund for the Implementation
of the Montreal Protocol**

Belize, 23-27 April 2001

WORKSHOP REPORT

Train-the-Trainers Workshop on Good Practices in Refrigeration

Organized by:

The Government of Belize

and the

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

in co-operation with Environment Canada

funded by the

Multilateral Fund for the Implementation of the Montreal Protocol

Belize, 23-27 April 2001

TABLE OF CONTENTS

Executive Summary	4
1. Background	5
2. Objectives	6
3. Expected Results	6
4. Participants	7
5. Methodology	7
6. Content	8
7. Results, Conclusions, Recommendations and Lessons Learned	8
8. Follow-up Action Plan	9
9. Annexes	9
Annex 1 Agenda	10
Annex 2 List of Participants	12
Annex 3. List of Trainer/Speakers	14
Annex 4 Workshop Recommendations	15
Annex 5 Evaluation Questionnaire	18
Annex 6 About the UNEP DTIE OzonAction Programme	20

Executive Summary

The train-the-trainers programme on good practices in refrigeration is part of a comprehensive approach to reduce the ODS consumption in the refrigeration servicing sector in Belize. Such approach is defined in the Refrigerant Management Plan (RMP) of Belize, which has been approved by the Executive Committee of the Multilateral Fund to be jointly implemented by UNDP and UNEP and Environment Canada.

The RMP of Belize is being jointly implemented by UNDP and UNEP which is responsible for the implementation of the training programme on good practices in refrigeration and the implementation of the training programme on control and monitoring of ODS imports and exports. UNDP will be responsible for the recovery and recycling programme.

The main objective of the training programme is to reduce the CFC consumption in the refrigeration and air-conditioning sector in Belize and to assist the country to comply with the phase-out schedule for CFCs under the Montreal Protocol. The programme consists of two phases, the train-the-trainers phase and the train-the-technicians phase. The trained trainers are expected to train the remaining approximately 100 service technicians in the refrigeration and air-conditioning sector in Belize.

The train-the-trainers workshop in Belize is the eight workshop of its kind in the Caribbean region as part of a National Refrigerant Management Plan.

Mr. Ismael Faro Chief Environmental Officer of the Department of the Environment expressed the commitment of Belize to comply with the provisions and phase-out schedules of the Montreal Protocol and its amendments during the opening speech of the train-the-trainers workshop. Further speakers include Mr. Ceil Ford Manager for the Centre for Employment Training and Mr. Martin Alegria.

Through the media coverage of the opening and closing sessions public awareness was generated.

The long term expected result of the training programme is to enhance good service and business practices in the refrigeration sector assisting the sector to switch over to non-CFC equipment in a smooth way without causing an unnecessary burden to the consumers.

During the train-the-trainers workshop 14 professionals from industry, government and training institutes were trained on good practices in refrigeration. The workshop included lectures on the harmful effects of ozone layer depletion and the resulting increase of UV-B radiation, the Montreal Protocol and its Amendments as well as lectures on CFC, HCFC and HFC refrigerants, recovery and recycling equipment, preventive maintenance practices. Lectures on retrofitting and envisioned future technological development on refrigeration sector were also included. Hands-on demonstrations with recovery and recycling equipment, using actual refrigeration units as well as stationary and mobile air-conditioning systems in need of recharge and maintenance were conducted as part of the training workshop.

During the last day of the workshop, the participants discussed details of the train-the-technicians phase and the further implementation of the RMP. They agreed on a set of recommendations including the ratification of the Montreal Protocol amendments, the establishment of an industry association, the implementation of an import/export licensing system and the adoption of a code of good practices in refrigeration (see Annex 4).

After the successful completion of the workshop, all participants passed a written examination and received two certificates, a participation certificate from the Government of Belize and a certificate from the Canadian Heating, Refrigeration and Air-conditioning Institute. One set of training equipment was handed over to each of the 3 major contracting Firms of Belize. Five trainers from selected firms along with the local training institute, in co-operation with the National Ozone Unit of the Ministry of Natural Resources and Environment, are now expected to train the remaining approximately 100 service technicians in Belize on good practices in refrigeration.

1. Background

In general, the most important sector in developing countries in which ozone-depleting substances are used is the refrigeration sector, predominantly for the servicing of CFC-containing equipment. Yet, poor servicing procedures such as flushing and venting often lead to the release of significant quantities of CFCs directly into the atmosphere.

In 1998, Belize consumed approximately 37 ODP tonnes of ozone-depleting substances (ODS) in the refrigeration and air-conditioning sector.

A significant amount of CFC emissions could be avoided through the application of good practices during design, installation, operation, servicing and decommissioning of refrigeration and air-conditioning equipment. Good practices include activities such as preventive maintenance and inspection, record-keeping, appropriate training, recovery & recycling as well as the safe handling of refrigerants. Good practices are easy to follow methods to achieve an early reduction of the CFC consumption in the refrigeration sector.

Belize has approximately 100 service technicians operating in the refrigeration and air-conditioning sector. Most of the technicians received formal training in a technical training center. Further training is often based on “experience” or “training on the job”. In addition, self-taught entrepreneurs from the informal sector are known to operate especially in the mobile air-conditioning sub-sector.

An abrupt non-availability of CFC refrigerants in the future may affect the ability of industries to perform and reduce the earnings of the country. It is essential for the CFC users to be able to reduce and subsequently phase-out their consumption in a co-ordinated, planned and cost-effective manner. Containment practices such as recovery and recycling are expected to ease the economic consequences of the phase-out.

Therefore, training on good practices in refrigeration and an effective recovery and recycling programme combined with prudent retrofitting and timely replacement are part of the overall phase-out strategy. They will assist Belize in meeting first control measures under the Montreal Protocol such as the freeze in consumption of Annex A CFCs .

2. Objectives

The main objective of this train-the-trainers workshop was to reduce the CFC consumption in the refrigeration and air-conditioning sector in Belize and to assist the country to comply with the phase-out schedule under the Montreal Protocol by:

- Increasing participants' awareness about ozone depletion, the Montreal Protocol, the environmental and economic benefits of good servicing practices and refrigerant containment as well as the concept of Refrigerant Management Plans.
- Introducing and demonstrating procedures that eliminate refrigerant emissions during preventive and unscheduled maintenance including recovery and recycling.
- Disseminating information on CFC free technologies available today and retrofitting of existing equipment.
- Stimulating the development of a network for information sharing throughout the sector.
- Helping the country to achieve the planned phase-out in a co-ordinated, planned and cost-effective manner, allowing to run existing CFC equipment until the end of its economic life.

3. Expected Results

The long term expected result of the training programme is to enhance good servicing and business practices in the refrigeration sector, assisting the sector to switch over to non-CFC equipment in a smooth way without causing an unnecessary burden to the consumers. More specifically, the main expected results are the following:

- Raised awareness in the general public regarding the harmful effects of ozone layer depletion through reporting in the media.
- Minimisation and elimination of uncontrolled emissions of ozone depleting refrigerants through better maintenance practices leak prevention and CFC recovery and recycling through training of refrigeration service technicians.
- Elimination of venting of CFC during purging and flushing.
- Increased use of non-CFC equipment and technology and non-CFC coolants.
- Reduction in CFC consumption once prudent retrofitting and replacement of refrigeration and air-conditioning equipment begins.

Technical training institutes in Belize are expected to incorporate a Montreal Protocol related training module on good practices in refrigeration in their normal curricula, ensuring that future technicians do not need re-training on this aspect.

4. Participants

In total, 14 refrigeration technicians participated in the train-the-trainers workshop. All participants had a strong professional background in the refrigeration sector and were coming from major industry companies and service workshops (13 participants), local trainers in industry or from the training institutes (1 participants). The list of participants is attached as Annex 2.

The instructor for the workshop was Mr. Ron Verch of HRAI (Heating, Refrigeration and Air-conditioning Institute of Canada).

The Ozone Officer Mr. Martin Alegria of the Ministry of Natural Resources and the Environment was responsible for the local organisation.

The closing session was attended by the Chief Environment Officer Mr. Ismael Fabro as well as Mr. Martin Alegria Ozone Officer.

5. Methodology

Appropriate training on good practices in refrigeration including containment, recovery and recycling, leak detection and repair and preventive maintenance as well as retrofitting and new technologies is crucial in order to run existing equipment until the end of its economic life, to reduce the emissions of ODS, and to achieve the planned phase-out in a co-ordinated, planned and cost-effective manner.

The five-day training used the train-the-trainers approach, where in a first phase a number of trainers were trained on good practices in refrigeration. The workshop consisted of both theoretical presentations and practical “hands-on” demonstrations. Participants had the opportunity to visit chiller plants in operation in one of the major hotels. This will enable the trained trainers to incorporate this information in the training agendas for their newly graduating students and to conduct training courses to upgrade the existing refrigeration technicians. The trained trainers are expected to train the remaining approximately 100 service technicians in the refrigeration and air-conditioning sector in Belize.

The subsequent training of the remaining refrigeration technicians will raise the awareness regarding ozone depletion issues, emission reduction of CFC refrigerants, and regarding new ozone friendly refrigerants. There will be several years during which CFC and non-CFC based equipment will be operated side by side in Belize. The training will ensure that the technicians understand the difference and servicing will be done appropriately.

UNEP’s “Training Manual on Good Practices in Refrigeration” was used as resource document. The “Guidebook for Implementation of Codes of Good Practice – Refrigeration Sector” may help the National Ozone Unit to initiate the establishment of a national code of good practice in the refrigeration and air-conditioning sector. A “Trainer’s Presentation Guide” has been prepared by HRAI, based on the above training materials and taking into account the specific training needs in Belize and new technology developments. This guide is also to be used as training kit for the train-the-technicians workshops.

6. Content

During the five-day workshop, the participants learned about the importance of ozone layer protection and the harmful effect of an increased UV-B radiation. The training included the related international agreements such as the Montreal Protocol and its amendments and explained the role of UNEP in the implementation of such treaties. The lecture reviewed the basic principles of refrigeration and responded to the question on how to service refrigeration and air-conditioning equipment in order to avoid refrigerant emissions and which alternative refrigerants could be used for retrofitting. They covered the different types of CFC, HCFC and HFC refrigerants and informed about preventive maintenance programmes, record-keeping and safety issues.

During the hands-on sessions, the participants practised the recovery and recycling of refrigerants from refrigerators and from stationary and mobile air-conditioning systems and did a retrofitting exercise.

Time was also allocated for discussions among the participants concerning the implementation of Belize' Refrigerant Management Plan and the train-the-technicians phase.

After the successful completion of the workshop, all participants passed a written examination and received two certificates, a participation certificate from the Government of Belize and a certificate of the Canadian Heating, Refrigeration and Air-conditioning Institute.

The workshop agenda is attached as Annex 1.

7. Results, Conclusions, Recommendations and Lessons Learned

The objectives of the workshop have been met and the main results are:

- Training of 14 trainers and key service technicians on good practices in refrigeration including recovery and recycling of refrigerants.
- Distribution of two certificates to each participant – a participation certificate of the Government of Belize and the HRAI certificate after passing the examination (see Annex 2).
- Exchange of information and experiences between the participants and development of a network of personal contacts.
- Trainer's Presentation Guide to be used for the further training of technicians.
- Detailed workshop recommendations by the participants (see Annex .4).
- Provision and hand-over of training equipment to 3 major contacting firms in the country – one set to each firm.

The following conclusions, recommendations and lessons learned could be drawn from the train-the-trainers workshop:

- The local organisation was excellent. The classroom was well equipped and air-conditioned and the refrigeration workshop appropriate for the practical hands-on sessions.
- It proved to be very efficient to have the secretariat of the workshop set up within the classroom.
- Lunch for the participants was organised at the training institute which saved time and avoided local transport .
- A cocktail was held at the end of the third workshop day which was a great opportunity to get in touch with each other.
- The training equipment was complete and appropriate.
- The instructor of HRAI does not expect that refrigerant recovery bags will be widely used when portable recovery and recycle equipment is available. Filled recovery bags are difficult to transport.
- The instructor of HRAI mentioned that hand pumps for the recovery of refrigerant are not very efficient and recommended the use of micron gauges as part of any good refrigeration practice.

The workshop participants agreed on a set of separate workshop recommendations (see Annex 4.) including the ratification of the Montreal Protocol amendments, the establishment of an industry association, the implementation of an import/export licensing system and the adoption of a code of good practices in refrigeration.

8. Follow-up Action Plan

This training programme is part of the RMP for Belize. As such it will be accompanied by other training and policy related activities as defined in the RMP which will be co-ordinated by the National Ozone Unit and which will ensure the phase-out of CFC in the refrigeration sector.

It also includes the consequent training of the remaining approximately 100 service technicians operating in the refrigeration air-conditioning sector.

The NOU will establish a control and monitoring mechanism to ensure that the objectives of the programme are met and will produce two follow-up reports on the status of implementation and the achievements of the training-the-technicians programme 12 months after completion of the train-the-trainers workshop.

The National Ozone Action Unit and UNEP will consider and, as far as possible, implement the workshop recommendations as adopted by the workshop participants. The recommendations should also be communicated to the relevant stakeholders and politicians (see Annex 4).

9. Annexes

Annex 1	Agenda
Annex 2	List of Participants
Annex 3	List of Trainer/Speakers
Annex 4	Workshop Recommendations
Annex 5	Evaluation Questionnaire
Annex 6	About UNEP DTIE OzonAction Programme

Annex 1 Agenda

Lead Consultant : Mr. Ron Verch
Heating Refrigeration and Air-conditioning Institute of Canada (HRAI)

Monday, 23 April 2001

08:00 Registration of participants

Opening Ceremony

08:30 – 10.30

Welcome Address by Mr Ismael Fabro
Chief Environmental Officer Ministry of the Environment

Mr. Cecil Ford
Manager Centre for Employment Training

10:30 Break

11:00 Workshop overview
Mr. Ron VERCH, HRAI instructor

11 :15 Belize Refrigerant Management Plan
Ozone Officer / Ron Verch

13:00 Lunch

14:00 Environmental issues

15:00 Review of basic principles of refrigeration

17 :00 Closure for the Day

Tuesday, 24 April 2001

09:00 Refrigerants CFCs, HCFCs and HFCs

11:00 Use of trade speciality tools

12:30 Lunch

13:30 Good refrigeration practices

17:00 Closure of the day

Wednesday, 25 April 2001

09:00 Good refrigeration practices

12:30 Lunch

13:30 Operation/use of passive and active recovery devices (*Practical*)

17 :00 Closure for the Day

Thursday, 26 April 2001

09:00 Recovery/recycling units (*Practical*)

12:30 Lunch

13:30 Retrofitting to alternative refrigerants

15:30 Creating maintenance programs

17:00 Closure of the day

Friday, 27 April 2001

09:00 Record keeping and general trade safety

10:00 Examination / Workshop Evaluation

13:00 Lunch

14:00 Adoption of Workshop Recommendations

15:30 Closing Ceremony
Distribution of Certificates and Handover of Equipment

16:00 Closure of the workshop

Annex 2 List of Participants

Mr Rene Allen	Instructor Centre for Employment Training Cor St. Thomas and St Thomas Streets Belize Tel :02-44798
Mr. Hezron Hernandez	Manager North Air Limited #29 Rivero Street Belize Tel : 02-74423
Mr. Steve Jones	Owner Jones Cooling and Power #135 MitchellStreet Ladyville Belize Tel : 025-24507
Mr. Aubrey Small	Service Manager HVAC Division Associated Engineering Services #119 Cemetery Road Belize Tel : 02-70076
Mr. Nigel Tillet	Mechanic HVAC and Refrigeration Belize Defence Force Ladyville Belize Ph : 025-2171
Mr. Hilario Duarte	Senior Refrigeration Technician Modern Engineering and Gas Company Po Box 41 Bullet Tree Road San Ignacio Belize Ph : 092-3075
Mr. Jamil Matar	Instrumentation Engineer Belize Sugar Industries Tower Hill Orange Walk District Belize Ph : 03-22150
Mr. Kerry Estephan	Manager and Owner K's Repair service ½ Mile Melinvia Road Belize Ph : 014-7160

Mr. Ramon Rodriguez	Production Supervisor Del Oro Belize Limited 14 ½ Mile Stann Creek Valley Road Belize Ph : 05-22055
Mr. Hansel Arnold	Bio Med Technician NEMC Medical Department Princess Margaret Drive Belize Ph : 05-22055
Mr. Omar Guerra	Technical Supervisor Bowman Electricial Company #4 North Park Street Belize Ph : 02-45495
Mr. Leroy Babb	Manager and Owner Babbs Servicing #6419 Marigold Lane Belize Ph : 02-33242
Mr Floyd Williams	Manager F.T. Williams and Associates 8 Lords Bank Road Ladyville Belize Ph : 025-3108
Mr. Jerry Williams	Senior Electrician Del Oro Belize Limited 14 ½ Mile Stann Creek Valley Road Belize Ph : 05-22080

Annex 3 List of Trainer/Speakers

Mr. Ron Verch	Heating Refrigeration and Air Conditioning Institute of Canada (HRAI) 5045 Orbitor Drive, Building 11 Suite 300 Missauga, Ontario L 4W4Y4 Canada Tel: 1-905 602-4700 Fax: 1-905 602-1197 Email: hraimail@hrai.ca Website: www.hrai.ca
Mr. Ismael Faro	Centre for Employment Training Department of the Environment Belize
Mr. Ceil Ford	Manager Centre for Employment Training Belize
Mr. Martín Alegría	Senior Environmental Officer Department of Environment Ministry of Natural Resources and the Environment 10/12 Ambergris Ave. Belmopan Belize Tel: (501) 822 816 / 822 542 Fax: (501) 822 862 Email: envirodept@btl.net

Annex 4 Workshop Recommendations

The following workshop recommendations were discussed and approved by all participants during the last workshop day.

1. Put in place a certification scheme for refrigeration and air-conditioning technicians. Only certified technicians should be allowed to repair systems containing ozone-depleting refrigerants and to purchase refrigerant gases.

The Ministry of Education, through the Centre for Employment Training (CET), should establish an examination and certification scheme at different levels.

The time-frame, legally required, for such a certification scheme for refrigeration and air-conditioning technicians should be defined, e.g. within three years, and the technicians should be informed well in advance.

2. Educate, inform and certify installers and buyers of CFC, HCFC, HC and HFC refrigerants and systems.
3. Develop and adopt a local code of standard practices in refrigeration. Existing codes of good practices could be adapted to local conditions and the Ministry of Education, trade, industry and technical training institutes must be involved in the process.
 - Eliminate flushing and venting of CFCs.
 - Recover refrigerants from all appliances before they are scrapped or sent to a landfill.
 - Limit the number of alternative refrigerants coming into the country. Industry should set an appropriate standard. As far as possible, pure refrigerants should be used. Interim refrigerants should be restricted to retrofitting and not used in new equipment.
 - Adopt a labelling system for refrigerants based on the international labelling system and one that is compatible with systems in the Caribbean region.
 - Use trade accepted measuring devices during charging for proper record-keeping.
4. Develop a continuous training and apprenticeship program on good practices in refrigeration including recovery and recycling. The industry must be involved in the preparation of such programs.
5. Require accountability for refrigerant purchased.

6. Establish a system for recovery and recycling of refrigerants in Belize and develop a programme / strategy at regional level for reclaim, disposal and destruction of CFC, HCFC and HFC refrigerants as well as used and contaminated oil from compressors and vacuum pumps.

Encourage dialog between the countries in the Caribbean region at political and industry level.

7. Implement incentives to apply recovery and recycling practices and disincentives for the use of CFCs and CFC-containing equipment.

Allow for duty-free import of recovery and recycling equipment.

Raise funds through taxes to finance proper disposal practices of refrigerants and research since the entire population is concerned by ozone depletion.

8. The implementation of the Refrigerant Management Plan (RMP) should follow the established measurable milestones and indicators to allow continuous monitoring and evaluation of the achievements and progress. An annual progress report should be produced and communicated to relevant stakeholders.

9. Raise public awareness and sensitivity on ozone depletion and its effects on the environment and human health through an ongoing educational programme or campaign at different levels. An ozone related training module should be integrated in the normal curricula of schools, colleges and training institutes.

Apprise the public that the control measures under the Montreal Protocol and its amendments such as the freeze and subsequent phase-out of ozone-depleting substances will be implemented by more than 165 countries in the world.

10. Make good practices such as recovery and recycling or the proper handling of refrigerant cylinders mandatory through the implementation of appropriate legislation and regulations. Involve industry representatives in the design and implementation of such regulations and legislation.

11. Provide targeted information to industry and engineering associations through approved Government agencies, the National Ozone Unit and UNEP.

12. Ban the importation of new and second-hand refrigeration and air-conditioning appliances working with CFC refrigerants. Second hand and reconditioned cars should have their air-conditioning units retrofitted or removed.

13. An association or network of refrigeration and air-conditioning technicians should be formed to represent the interests of this sector and to provide information to the technicians.

14. Establish a licensing system for the import and export of CFC refrigerants. As part of this licensing system, wholesalers, retailers and technicians should maintain records for all transactions involving ozone-depleting refrigerants and equipment containing ozone-depleting refrigerants.

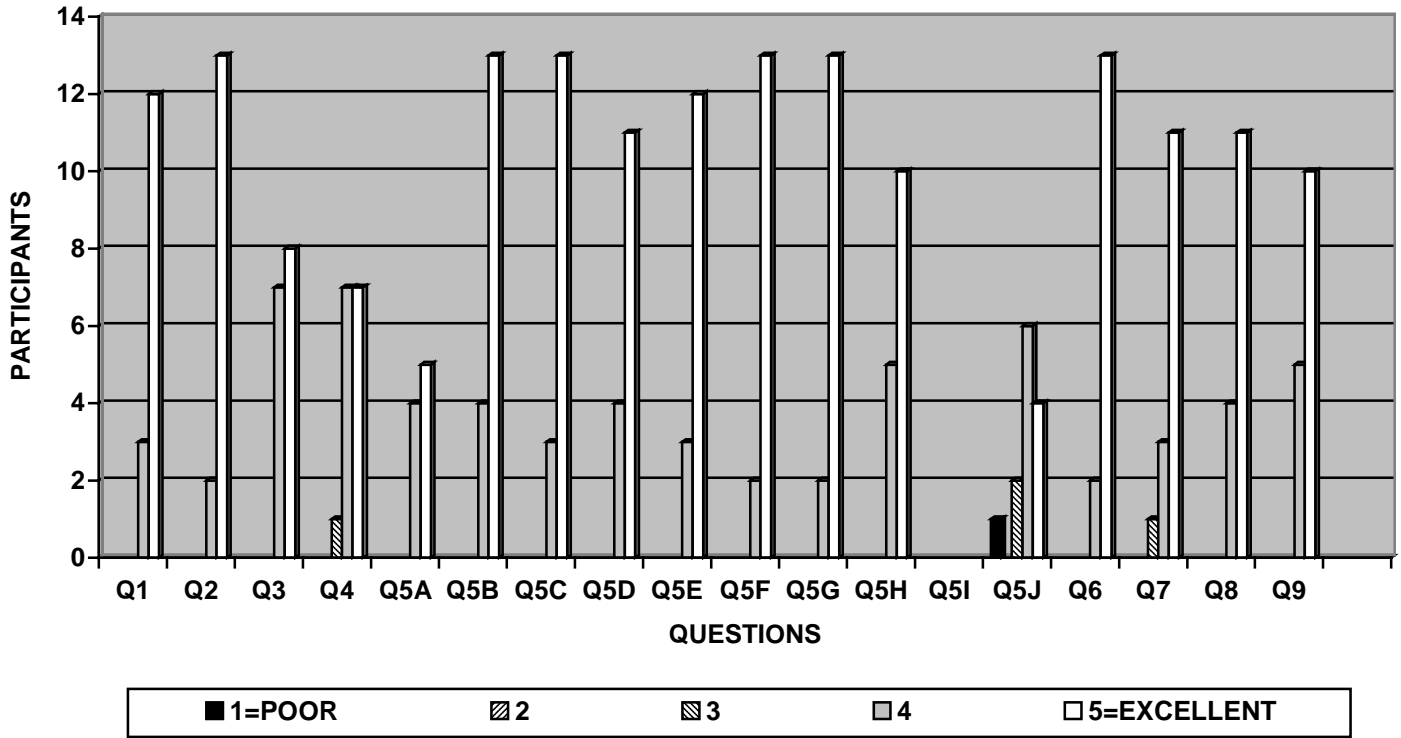
15. Adjust refrigerant prices so that CFCs will be more expensive than HCFC or HFC refrigerants. The customs department should create tariffs on imported CFCs.
16. Belize should aim to ratify the amendments to the Montreal Protocol and to meet the control measures under the Protocol and its amendments.

Annex 5 Evaluation Questionnaire

The following questionnaire was given to participants to evaluate the training course. The responses are tabled in a graph in the following page, from 1 for poor to 5 for excellent).

1. What is your overall evaluation of the course ?
2. Did the course provide the information you expected ?
3. Was the communication between participants possible and useful ?
4. Was the composition of the audience adequate ?
5. As far as the contents of the presentation are concerned, did you find them adequate in explaining:
 - a) Environmental issues
 - b) Basic principles of refrigeration
 - c) CFC/HCFC/HFC/HC refrigerants and technologies
 - d) General trade safety
 - e) Operation and use of trade speciality tools
 - f) Operation and use of passive and active recovery devices
 - g) Good refrigeration practices
 - h) Retrofitting to alternative refrigerants
 - i) Creating preventive maintenance programs and record-keeping
 - j) RMP concept at company level
6. Has the recovery issue been adequately dealt with in the practical hands-on sessions ?
7. Did the training course provide you with relevant information regarding the Refrigerant Management Plan in your country ?
8. Did the training course provide you with the relevant information regarding the train-the-technicians phase and your role in it ?
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) ?
10. Please give additional comments about the quality of the course and how similar courses could be improved.

WORKSHOP EVALUATION BELIZE



Annex 6 About the UNEP DTIE OzonAction Programme

Nations around the world are taking concrete actions to reduce and eliminate production and consumption of CFCs, halons, carbon tetrachloride, methyl chloroform, methyl bromide and HCFCs. 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 172 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 109 developing and 8 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 about these services please contact:

Mr. Rajendra Shende, Chief, Energy and OzonAction Unit
UNEP Division of Technology, Industry and Economics
OzonAction Programme
39-43, quai André Citroën
75739 Paris Cedex 15 France
Email: ozonaction@unep.fr
Tel: +33 1 44 37 14 50
Fax: +33 1 44 37 14 74
www.uneptie.org/ozonaction.html



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 its head office in Paris, is composed of one centre and four units:

- 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 Unit.
- 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.

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.