

**United Nations Development Programme**  
**Country: GEORGIA**  
**Project Document**

**Project Title: HCFC Phase-Out Management Plan**

**UNDAF Outcome(s):** Disaster Risk Reduction

**Expected CP Outcome(s):** 3.2.1 Enabling environment and status of implementation of national and international environmental commitments.

**Expected Output(s):** 3.2.2 System, institutional and staff level capacities enhanced for implementation of national environmental commitments and major international agreements on climate change, biodiversity, land degradation and chemicals. 3.2.3 Environmental concerns and climate change risk considerations incorporated in national policies, strategies and programmes.

**Implementing Partner:** Government of Georgia through the Ministry of Environment Protection

**Responsible Parties:** Government of Georgia through the Ministry of Environment Protection

**Brief Description**

Georgia as a party to the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that deplete the Ozone Layer has taken a commitment set out in the protocol and its amendments. Georgia has implemented several measures to reduce the consumption of CFCs in the air conditioning and refrigeration service sector. These efforts funded by Multilateral Fund to Montreal Protocol (MLF) have had a clear impact on the market and most of the new systems are now non-CFC based.

The project proposal consists of a HCFC Phase out Management Plan (HPMP) for Georgia to be implemented through two main implementation phases. The HPMP is developed in a staged approach, the first stage of which covers the period from the year 2011 to 2020 and encompasses commitments to freeze HCFCs consumption in 2013, with further 10% and 35% reduction targets in 2015 and 2020.

The overall goal for the implementation of the HPMP is to ensure sustainable and cost-effective phase-out of HCFC through implementation of a combination of interlinked measures of non-investment and technical assistance components. These measures, supported by the national legislation, monitoring and targeted information promotion activities will enable Georgia to phase out HCFCs according to the schedule of the Montreal Protocol.

Programme Period:	2011-2015
Key Result Area (Strategic Plan):	Energy and Environment for Strategic Development; Disaster Risk Reduction
Project Title:	HCFC Phase-Out Management Plan
Atlas Award ID:	<u>00064446</u>
Project ID:	<u>00081260</u>
Start date:	<u>01-02-2012</u>
End Date:	<u>31-12-1014</u>
PAC Meeting Date:	<u>March 16, 2012</u>
Management Arrangements:	<u>NIM</u>

AWP budget:	<u>USD 200,000</u>
Total resources required:	USD 500,900
Total allocated resources:	USD 200,000
• Regular:	_____
• Other:	_____
o MLF:	<u>USD 200,000</u>
o Government:	_____
Unfunded budget:	(other tranches): <u>USD 300,900</u>
In-kind Contributions:	_____

Agreed by (Government): Ministry of Environment Protection of Georgia  
 Mr. George Khachidze, Minister

NAME

*George Khachidze*  
 SIGNATURE

DATE

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Agreed by UNDP:

Jamie Mcgoldrick, Resident Representative

NAME

*Jamie Mcgoldrick*  
 SIGNATURE

DATE

26/3/2012

## I Executive Summary

The HCFC Phase-out Management Plan (HPMP) is developed to enable Georgia to meet the obligations under the Montreal Protocol and its Amendments. It has been prepared by the Ministry of Environment Protection of Georgia with assistance from UNDP. The HPMP has been formulated following the process and guidance provided by the relevant decisions of the Meeting of the Parties of the Montreal Protocol and the Executive Committee of the Multilateral Fund.

Due to rapid economic growth, Georgia's consumption of HCFCs has been steadily increasing during the past several years. Based on the survey conducted, Georgia consumes HCFC22 in the servicing of refrigeration and air conditioning equipment and HCFC142b in the solvent sector. The Starting point for sustained aggregate reductions is calculated according 2009 data and projected consumption in 2010: for HCFC22 would be 83.9 metric tonnes and for HCFC142b would be 11 tones.

Georgia is seeking financial assistance from the Multilateral Fund (MLF) to fund the activities listed in the HPMP to freeze HCFC22 consumption by 2013 and to meet 10% and 35% reduction targets in 2015 and 2020 according to the Montreal Protocol targets. Moreover, Georgia will totally phase out the consumption of HCFC142b in the solvent sector by 1 January of 2016. The overall incremental cost estimated for implementation of HPMP of Georgia stage 1 is US\$ 500,900 USD, plus agency support costs of US \$37,568 for UNDP. The details are provided in the table below:

Activities	Cost in USD
Servicing refrigeration sector	315,000
Total phase out of HCFCs in the solvent sector	185,900
Agency Fee	37,568
<b>Total</b>	<b>538,468</b>

Therefore, Georgia is adopting a two-step strategy that should allow a 35% of the HCFCs reduction during its first phase over the period 2011 to 2020. Thereafter, elimination will continue until reaching the overall consumption reduction rate of 97.5% in 2030 and keeping an allowance of 2.5 percent of the baseline consumption for meeting servicing needs till 2040. Georgia will submit the plan for the stage two in the year of 2019, for the preparation of which additional funds will be allocated by the MLF

Georgia and UNDP will explore possibilities of additional funding sources for the ozone-climate co-benefit components under the GEF (Climate Focal Area/Energy efficiency) or bilateral cooperation.

The HPMP (stage 1) will be implemented through the following components:

**Component 1: Policy, Regulatory and Institutional Support.** One of the important regulatory measures to be introduced is an application of Import Quotas on HCFCs. Georgia will introduce quotas according to the phase out schedule of the Montreal Protocol in order to

comply with its targets. Another important regulatory measure would be the introduction of import quota for new equipment containing HCFCs. Furthermore, improvements in the certification system and the control of service methods and equipment containing ODSs are also proposed under the project.

**Component 2: Training, Capacity-building and Awareness** includes updating a Code of Practice, Training on good practices in the refrigeration sector, Training of future technicians and further strengthening of vocational schools, Training of Customs officers to monitor HCFC import-export, Strengthening the Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers and Targeted awareness campaign.

**Component 3: Demonstration projects** are proposed under HPMP. First of all, demonstration projects to use natural refrigerants since there is a clear need to execute such projects to build a local practical experience and confidence of end-users.

**Component 4: Technical assistance to support good servicing practices in the refrigeration sector.** This component addresses the physical capacity requirements associated with the urgent and longer term need to upgrade the country's refrigeration servicing sector. It is envisioned to have two specific activities described below: support to upgrade the service equipment and improved infrastructure for re-use of refrigerants.

**Component 5: Technical assistance in the solvent sector** which has been developed to address the phase out of the entire consumption of HCFC-142b in the solvent sector in cost-effective manner. The proposal includes assistance for retrofitting the equipment of cleaning companies from HCFC142b to the alternative solvents.

**Component 6: Project implementation, monitoring and evaluation.** The objective of this component is to ensure that all planned activities are fully carried out according to the agreed timetable and are satisfactorily completed and followed-up

Total fund requested from Multilateral Fund including implementing agency fee:

Implementing Agency	Project Cost US\$	Agency Fee US\$	Total US\$
UNDP	500,900	37,568	538,468
<b>Grand total</b>			<b>538,468</b>

## 1. Country Profile



### *Geography and people*

Georgia, covering an area of 69,700 square km, is located in the west of the South Caucasus region, bordering the Russian Federation in the north, and the Republics of Azerbaijan, Armenia, and Turkey to the south. It is located on the southern slopes of Great Caucasus Mountain Range, on the isthmus

between the Black and Caspian Seas. The western coastline of Georgia is bordered by the Black Sea. Georgia is distinguished by its complex and varied relief. The north is dominated by the mountains of the Great Caucasus Range, while Southern Georgia is traversed by the South Georgian Plateau. From the shore of the Black Sea in the west to the Alazani Valley in the east run the inter-mountain lowlands of Georgia. The mountain range Likhi divides the country into two parts differing in climate: Eastern Georgia and Western Georgia. The highest peak is Shkara (5,198m), the lowest place (-1.5m) is the environs of lake Paliastomi in the Kolkheti Lowland. Forests constitute 38% of the country's territory and cover 2.7million hectares (6.6 million acres).

The capital of Georgia is Tbilisi and it is the largest city of the country (1,106,700 citizens) lying on the banks of the river -Mtkvari. The city is home to more than 100 different ethnic groups. Around 80% of the population is ethnically Georgian. Other significant ethnic groups include: Russians, Armenians, Azeris, Ossetians, Abkhazians, Ukrainians, Greeks, Jews and others.

Table 1.1: A quick glance at important geography and people statistics of Georgia

Components	Information on geography, people and other related statistics
Country name	Georgia
Capital	Tbilisi
Geographic coordinates	42 00 N, 43 30 E
Area	69,700 sq km
Land boundaries	Total: 1,461 km Border countries: Armenia 164 km, Azerbaijan 322 km, Russia 723 km, Turkey 252 km
Coastline	310 km
Elevation extremes	Lowest point: the lowest place (-1.5m) is the environs of lake Paliastomi in the Kolkheti Lowland Highest point: Mountain Shkhara (5,201 m)
Administrative divisions:	9 regions, 9 major cities, and 2 autonomous republics
Population	4,677,401 (July 2005 est.)
Language	Georgian is the state language in Georgia
Large cities - population	Tbilisi - 1,106,700; Kutaisi - 188,600; Rustavi - 117,300; Batumi - 122,200; Sokhumi - 43,000; Gori -42,000; Zugdidi - 69,000; Poti - 47,400; and Tskhinvali - 7,000
Religions	Orthodox Christian 83.9%, Muslim 9.9%, Armenian-Gregorian 3.9%, Catholic 0.8%, other 0.8%, and none 0.7%
Natural resources	Forests, hydropower, manganese deposits, iron ore, copper, minor coal and oil deposits; coastal climate and soils allow

Sources: Ministry of Foreign Affairs of Georgia and Tbilisi Municipality Portals

*Climate*

Almost every climatic zone is represented in Georgia except for savannas and tropical forests. To the North, the range of the Great Caucasus protects the country from the direct penetration of cold air. The circulation of these air masses has mainly determined the precipitation regime all over the territory of Georgia. The climatic picture totally differs in both parts of Georgia as divided by the Likhi Range.

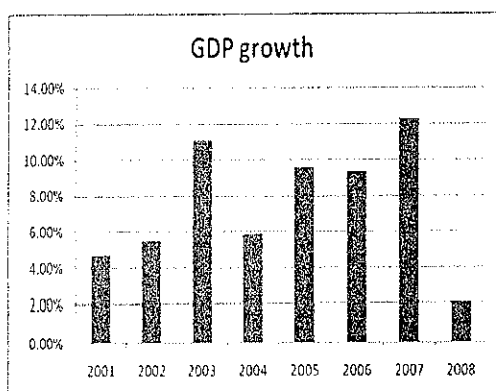
The climate in Western Georgia is highly diverse, altering in certain areas very sharply from humid subtropical to permafrost. The climate is determined by the Black Sea coast to the West, and by the amphitheatre of three big mountain ranges (the Great Caucasus, the Likhi and the Meskheti), in addition to the surrounding Kolkheti lowland (wetland) in the very centre. The Black Sea coastal zone has a humid subtropical climate and Warm, moist air from the sea moves easily into the coastal lowlands from the west. The average annual temperature is 14-15<sup>0</sup>C and annual amounts of precipitation vary between 1,500 mm and 2,500 mm. The Black Sea influences the climate of West Georgia, resulting in mild winters, hot summers and abundant precipitation. Here in the mountainous and high mountainous areas, the annual air temperature ranges from 2-4<sup>0</sup>C to 6-10<sup>0</sup>C and annual amounts of precipitation range between 1,200 mm and 2,000 mm.

In East Georgia the climate is also complex: the basin of the River Mtkvari (Kura) crosses the central plain. To the South of the river stretches the volcanic Javakheti Highland, with the Samsari Range (its highest peak at 3,301 m above sea level) at its centre. Kakheti makes up the extreme eastern region, which borders the southern branch of the Great Caucasus range from the North. The climate in the plains of East Georgia is dry: in the lowlands, it is dry and continental; and in mountainous areas, it is alpine. The average annual temperature is 11-13<sup>0</sup>C in the plains, and 2- 7<sup>0</sup>C in the mountains. The annual amounts of precipitation vary within the range of 400-600 mm in the plains, and 800-1,200 mm in the mountains.

*Economy*

In the last few years the Georgian Government has introduced a number of reforms which have ensured the overall macro-economic stability, fiscal consolidation and continuous growth. Georgia locates at the crossroads of Europe and Central Asia, Georgia's three major oil and gas pipelines, Black Sea ports, well-developed railway systems, together with its airports are playing an increasingly important role in linking East and West.

Consistent macroeconomic policies, burst of entrepreneurial activity, growth in domestic consumption, rehabilitation of infrastructure and export growth are producing the economic growth. Real GDP growth in 2008 was 2.1% while in 2005 and 2006 it was nearly 10%, and over 12% in 2007.



Graph 1-1: Real GDP growth data (2001-2008)

Source: the Department of Statistics of Georgia

It should be highlighted that Georgia's industrial sector is rather diversified, encompassing food and timber processing, production of fertilizers, coal and magnesium ore mining, steel and non-ferrous metallurgy etc. In Georgia's industrial sector, many companies are being modernized and modern managerial culture has been introduced. The government's policy is designed to facilitate integration into international markets and implementation of economic reforms. Reform has yielded strong growth of industrial output and the share of industrial output produced by private enterprises.

A matter of national pride for Georgians, wine is worthy of special emphasis. Viticulture and winemaking are the most important traditional fields of Georgia's agriculture. The country is considered as one of the oldest places of producing the top-quality wines in the world. There are over 4,000 vine varieties in the world. Over 450 species of local vine are bred in Georgia, from which 62 sorts are put in the standard assortment including 29 wine species and 9 table ones. Moreover, Georgia's agricultural sector is diversified ranging from growing of wheat, cereal, soy, cooking oil and corn to nuts, tea, citrus, and herbs. Certainly, the substantial further investments in technological and infrastructure capacity are essential to ensure the modernization of agricultural practices in Georgia.

A picturesque nature, landscapes, subtropical zone of the Black Sea, rivers and waterfalls, cave towns, resorts and mineral springs, urbanized cities and settlements, and traditional Georgian hospitality make Georgia the country of tourism. It is interesting to emphasize that Georgia has currently a system of protected areas covering about 482,842 ha of land or 7 % of the country's territory. The Protected Areas network has grown to include 21 nature reserves, four national parks, three national monuments, eleven managed reserves and one protected landscape. There are over 12,000 historical and cultural monuments in Georgia, four listed by UNESCO as cultural heritage sites, 103 resorts, 182 resort places and more than 2000 mineral springs in Georgia which encompass ski and snow, spa and sea.

## **2. General Context and Background**

The project proposal consists of a HCFC Phase out Management Plan (HPMP) for Georgia to be implemented through two main implementation phases beginning of 2011. This HPMP was prepared by the National Ozone Unit of the Ministry of the Environment Protection and Natural Resources (the NOU of Georgia), with the assistance of UNDP and the international consultant from Sweden. HPMP preparatory funds were approved at the 55<sup>th</sup> meeting of the Executive Committee (ExCom) in July 2008. Moreover, preparation for HCFC phase-out investment activities (refrigeration sector) was approved at the 57<sup>th</sup> meeting of the Executive Committee (ExCom) in April 2009.

The HPMP is developed in a staged approach. The first stage of the planned activities covers the period from the year 2011 to 2015 and the second stage is related to the period 2016 – 2040. Phase I of the HPMP covers commitments to freeze HCFCs consumption in 2013 (base level - annual consumption in 2009-2010) and to reduce HCFCs consumption by 10% in 2015. The Phase 2 (2016-2040) will include implementation of various activities to meet commitments of 2020 (35% reduction), 2025 (67.5% reduction), 2030 (97.5 reduction) and

2040 for the complete phase out of HCFCs in Georgia as these obligations are taken by the Government of Georgia under the Montreal Protocol on the Substances that Deplete the Ozone Layer.

A particular priority of in the context of this HPMP is expanded cooperation with the European Union. A Partnership and Cooperation Agreement between Georgia and the European Union has been in place since 1999 and Georgia actively participates in the EU "European Neighborhood Policy" and signed the EU-Georgia Action Plan with time line for five years in 2006. The plan is an important document defining strategic goals of EU-Georgia collaboration. The implementation of the action plan will further promote growing relationships between Georgia and EU and enlarge the level of economic integration and deeper political collaboration. Realization of Action Plan will support Georgia to meet the norms and standards of EU in various sectors. Strong public support exists for seeking membership in the EU and government officials have expressed the desire for Georgia to become the EU member state.

A Special condition of the HPMP is that the Abkhazian region is not included to the programme activities. As a result of the war approximately 250,000 persons (mainly ethnic Georgians) fled Abkhazia for other regions of the country. Refugees now comprise about one-tenth of the population of Georgia. Abkhazia is legally part of Georgia and has autonomous status within it but the Government of Georgia does not control this region. Since the conflict, one of the bloodiest in the post-Soviet area, remains unresolved, the survey of the ODSs use including HCFCs in this region has so far not been possible.

It is important to highlight that the HPMP will ensure sustainable and cost-effective phase-out of HCFC through implementation of a combination of interlinked measures of non-investment and technical assistance components. These measures, supported by the national legislation, monitoring and targeted information promotion activities will enable Georgia to phase out HCFCs according to the schedule of the Montreal Protocol.

### **3. Institutional and Regulatory framework**

#### *Institutional arrangements*

The Ministry of Environment Protection of Georgia is the responsible authority for the implementation of the Montreal Protocol in Georgia and it oversees the implementation of the ozone related activities in the country. The National Ozone Unit is created under the Ministry through assistance of UNEP and UNDP and it facilitates, coordinates and implements ODS phase-out policies and projects. The NOU is supported by the Montreal Protocol Enabling Activities (EA) programme of UNDP which composes Montreal Protocol relating output projects (IS, TPMP, and HPMP preparation). The output projects are managed by the Montreal Protocol EA Programme Manager. All output projects under the MP program are implemented by the project team - UNDP Service Contract staff.

The Ministry designated the National Project Director (NPD) of EA programme who "supports the program or project and serves as a focal point on the part of government. NPD's responsibility normally entails ensuring effective communications between the partners and monitoring of progress towards expected results".UNDP. Moreover, the EA programme Executive Board is established and it composes representatives of the NOU, the Ministry and UNDP as well as a National Project Director, Project Manager, Project implementation team,

National Ozone Focal Point and representative of the Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers. This board has a general oversight function, give guidance to the programme and make key decisions in the field. It meets at least once in a quarter.

The Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers were established in 1999. This Association is a unique organization in Georgia which brings together service companies, end-users, scientists and technicians in the refrigeration and air-conditioning sector. It is a key organization which advises the Board on technical and technological aspects of the implementation of the phase out strategy in the refrigeration and air-conditioning sectors. The association assists the country to expand market opportunities for alternative technologies and, consequently, reduce or minimize emissions and environmental impacts.

Moreover, the Georgian Refrigerant Recovery and Recycling Centre (GRRRC) was established in 2005. GRRRC plays an important role in introducing Good Practices and demonstrating the use of recover, recycling and reclaim equipment to the service market. It also helps growing a market for used (recycled) refrigerants and increasing lifetime of refrigeration equipment due to contaminant removal (actual reduction in need for virgin refrigerants). The necessary recovery, recycling and reclaim equipment have been provided by UNDP and UNIDO (reclaim and recycling machines, a Gas Chromatograph, a moisture meter, basic equipment and etc) within the framework of previous activities. The GRRRC plays an important role in organization of practical training seminars for students of the Vocational Schools. In addition, the function of GRRRC has been further expanded through installation of Halon Reclamation Facility which allows recovering and recycling halons in Georgia.

#### *Regulatory framework*

The key principles of environment protection are reflected in the Constitution of Georgia. Specifically, the Article 37 of the Constitution confers that "everyone shall have the right to live in healthy environment and enjoy natural and cultural surroundings. Everyone shall be obliged to care for natural and cultural environment. With the view of ensuring safe environment, in accordance with ecological and economic interests of society, with due regard to the interests of the current and future generations the state shall guarantee the protection of environment and the rational use of nature."

Georgia has ratified the following ozone regime agreements on the specified dates below:

<b>Agreement</b>	<b>Date of ratification</b>	<b>Entry into force</b>
Vienna Convention	The Cabinet of Ministers of Republic of Georgia by Decision N711 of 8 November, 1995.	19 June, 1996
Montreal Protocol	The Cabinet of Ministers of Republic of Georgia by Decision N711 of 8 November, 1995.	19 June, 1996
London Amendment	Georgia acceded to the	10 October, 2000



	London amendment by the Decision N376-IIs of 14 June, 2000 of Parliament of Georgia	
Copenhagen Amendment	Georgia acceded to the Copenhagen amendment by the Decision N377-IIs of 14 June, 2000 of Parliament of Georgia	10 October, 2000
Montreal Amendment	Georgia acceded to the Montreal amendment by the Decision N378-IIs of 14 June, 2000 of Parliament of Georgia	10 October, 2000
Beijing Amendment	Pending	Pending

It also should be highlighted that Georgia has been re-classified as an Article 5 country of the Montreal Protocol by decision VIII/29 of the MOP in 1996.

At the same year, the Law on Environmental Protection which represents so-called "framework law", constitutes the basis for the establishment of a comprehensive environmental Legislation of Georgia. The law was adopted by 10 December, 1996, N519 and it includes the Article 52 on the Protection of the Ozone Layer:

1. The legal entity is obliged to reduce or phase out production and use of such chemical substances which have adverse impact and can deplete the ozone layer.
2. Above mentioned chemical substances are imported to Georgia only under a special permit.
3. Regulatory framework of protection of the ozone layer is provided by Georgian legislation under Georgia's jurisdiction.

Georgian Law on "Protection of Ambient Air" was adopted by 22 June, 1999, N2116 and the protection of ozone layer is covered by the Article 54:

1. Further to commitments of Georgia under the Vienna Convention on the Protection of the Ozone Layer and the Montreal Protocol on the Substances that Deplete the Ozone Layer and for the purpose of protection of earth's ozone layer is required to have step-wise reduction or phase-out of production and consumption of substances that deplete the ozone layer.
2. Import, export, re-export and transit of ozone depleting substances into Georgia shall be made only subject to a special permit according to 7<sup>th</sup> paragraph of Article 24 of the law concerning "On Enterprise Activity Licensing and Bases of Permission Issues" (14 May, 2002 N1426). Identification, custom statistics for such substances and products shall be carried out pursuant to commodity description and coding system defined by commodity register of external economical activities.
3. Production of ozone layer depleting substances listed in Annexes A and B of the Montreal Protocol on the Substances that Deplete the Ozone Layer is prohibited.
4. Further to commitments of Georgia under Montreal Protocol on the Substances that Deplete the Ozone Layer, development and implementation of national program and

- action plans for step-wise phase-out of ozone layer depleting substances shall be coordinated by the Ministry of Environment Protection of Georgia.
5. Within Georgian jurisdiction, legal regime of ozone layer protection is constituted by the provision "The Control of Ozone Depleting Substances in Georgia", approved by the Decree of Georgian president.

Presidential Decree on "The Control of Ozone Depleting Substances in Georgia" was adopted in 8 May, 2002, N226. The control over the import and export of ODSs and certification of the technicians dealing with ODS containing equipment and storage containers are main parts of the decree.

Based on the new Georgian law concerning "On Enterprise Activity Licensing and Bases of Permission Issues" (14 May, 2002 N1426), the new order "Permission on production, transport, import, export, re-export and transit of restricted chemical substances/goods" was adopted by the Government of Georgia, 28 September of 2006, N184.

According to the order, all dangerous chemicals including ODSs are regulated by the integrated permit system which is issued by the Ministry of Environment Protection of Georgia. All substances listed in the Montreal Protocol are subject of this order (Annexes - A, B, C and E). Therefore, HCFCs are regulated by the integrated permit system. Georgia does not produce any of the substances controlled under the Montreal Protocol and the consumption of these substances is represented only by import. In order to import dangerous chemicals including ODSs, the legal entity must submit an official declaration, company's name with appropriate indication of legal-institutional status, juridical address, copy of records kept in entrepreneurs' registration book, a copy of the receipt for paid tax for import permit. It should be pointed out that there is no presently quota allocation for Annex C (HCFCs) substances and measures for introduction of the quota system are included in the proposed policy and regulatory measures under current HPMP.

In addition, the importing company must present a certificate of origin, a certificate of compliance, a copy of the contract and information about the labeling and packaging. If the transportation within the country of dangerous chemicals including ODSs is executed, the following supplementary documents must be presented: information about transport type, vehicle special equipment for transportation of dangerous chemicals including ODSs, a certificate of driver's eligibility to transport dangerous chemicals including ODSs, an indication of the route, labeling of transport vehicle and dangerous goods, and a plan for the emergency response.

It is important to note that certification of technicians in the country is regulated by Georgian Law "About Professional Education» (28 March, 2007 N4528). Therefore, certificates for RAC technicians are issued according to Professional Standard "Refrigeration, Air conditioning and Heat pump Technician" adopted by the Ministry of Education and Science of Georgia (MES).

The National Code of Practice for refrigeration sector was considered by stakeholders, government and scientific organizations, NGO-s and final document was registered by the National Agency for Standards, Technical Regulations and Metrology of Georgia (Registration Number 268-1.1-00227, 7 July 2008). The National Code of Practice in the

refrigeration sector was developed by the national experts mainly from the Georgian Association of Refrigerating, Cryogenic and Air Conditioning Engineers through assistance of the Terminal Phase out Management Plan.

The Code of Practice supports introduction and implementation of standards for installation/service in the refrigeration sector. It was developed in accordance with the Georgian legislation. The Code covers aspects such as installation of equipment, operation and maintenance, preventive maintenance, record keeping and documentation, leak testing, recovery and recycling, evacuation and charging procedure, retrofitting procedures, compressor oil change, safety requirements etc.

#### 4. Review of previous activities in the field

##### *Overview of previous activities*

Georgia has successfully implemented a number of activities through the assistance of the Multilateral Fund of the Montreal Protocol such as National training programme on good practices in the refrigeration sector, National Programme for Recovery & Recycling of Refrigerants, Training programme for customs officers on control and monitoring of ODS imports and exports, Incentive Programme for the End-Users in the commercial/industrial Refrigeration and Refrigeration Transport sub- Sector and Terminal phase out Management Plan for CFCs.

Activities	Objectives	Achieved results
National training programme on good practices in the refrigeration sector	Minimization and elimination of uncontrolled emissions of ODSs through better maintenance practices and ODS recovery and recycling by training refrigeration service technicians.	"Training the Trainers" workshops were organized at 14-18 February of 2000 and 11-13 of April of 2005. 25 experts were selected and trained as trainers. 500 refrigerant technicians were trained in total during the programme implementation and these workshops were organized in different cities of Georgia: Tbilisi, Kutaisi, Batumi, Khobi and Telavi.
National Programme for Recovery & Recycling of Refrigerants	To create and put into action a comprehensive national programme to recover and recycle through establishment of R/R centers To reduce the release of ozone-depleting refrigerants during repair and maintenance as well as to train personnel to correctly and safely recover and recycle CFCs from air-conditioners and refrigerators	Two Recycling Centers has been established in Tbilisi (East Georgia) and in Kutaisi (West Georgia). Two training workshops were completed in Tbilisi and Kutaisi in 1999. In total, 90 refrigeration technicians and instructors were trained. These seminars included both theoretical and practical parts and emphasized on the good practice and safety in the handling of refrigerants during the installation, servicing and dismantlement of refrigeration and air conditioning equipment.

		60 sets of recovery equipment were distributed through UNDP to refrigeration technicians
<b>Training programme for customs officers on control and monitoring of ODS imports and exports</b>	To Enable customs and enforcement officers to get acquainted with ozone issues under the Montreal Protocol. To enable them to get acquainted with the ODS regulations and other legislation regarding ozone issues in the country. To provide them with necessary practical skills and knowledge in identifying different types of refrigerants.	National Train-the-Trainers Workshop was organized in Tbilisi from 30 April to 2 May 2003. In total, 30 customs and enforcement officials were trained, detection equipment was provided, the UNEP customs training manual was translated and the Handbook on ODS Legislation and Import/Export licensing systems database was developed. 150 experts (Customs officers from various points of entry and customs sections, e.g. computer and data processing unit, document processing unit, administration unit, enforcement officers, and customs laboratory) were trained through 6 national workshops.
<b>Incentive Programme for the End-Users in the commercial - industrial refrigeration and refrigeration transport sub-Sector</b>	To supply technical advice on the retrofitting and conversion of refrigeration equipment and financial incentives to refrigeration end users with commercial and industrial CFC installations to permanently retrofit or convert these installations to employ very low ODP or non-ODP refrigerants. To encourage the use of safe alternative to CFC refrigerants by the owners and end-users of commercial and industrial refrigeration installations	This programme was completed with the assistance of UNDP with excellent results in April 2005. 15 enterprises (instead of 8 enterprises initially proposed) in total received the assistance for changing refrigeration systems from CFC to alternative refrigerants. Two companies made retrofitting of own installation without any financial support from the incentive programme (only technical assistance). This was the first own initiatives of such conversion in Georgia and the country was able to comply with 50% reduction of CFC-12 for 2005.
<b>Terminal Phase out Management Plan of CFCs</b>	To ensure timely, sustainable and cost-effective CFC phase-out through an inter-linked combination of regulations, training of technicians, use of existing stock, targeted information, stakeholder involvement and management support as well as to meet the phase-out targets for CFCs as stipulated by the Montreal Protocol and	The R/R centers were equipped with modern equipment for identification and reclaiming of refrigerants such as gas chromatograph (GC), reclaim machine etc. On-site training workshops for the technicians of the centers were organized. Furthermore, modern tools and equipment for Good Practice in Refrigeration were transferred to the best six service companies. Another important component of the

	national regulations.	<p>TPMP was upgrading of vocational schools curriculum and equipment and competency of teachers. Three vocational schools were equipped with modern tools/training equipment and a special training programme was developed by the project. Three best students were awarded with professional internship in Germany.</p> <p>One of the important components of TPMP was a strengthening of the customs capability to monitor imports and identifying/classifying refrigerants. The project organized two workshops for 35 customs officers on identification of CFCs. Practical sessions were included to the work-programme.</p> <p>Another component had a goal to enhance a competence of technicians and confidence of end-users in retrofit/replacement methods and in using non-ODS technologies through implementing of demonstration activities. Two large CFC consumers were selected by the project for introduction of CFC-12 free technologies using automatic control systems. Demonstration of modern technologies, alternative refrigerants and tools was extremely helpful in raising awareness of end-users about ODS phase out and climate benefits (energy efficiency and emission reductions).</p>
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Therefore, Georgia achieved remarkable successes in effective implementation of activities resulted in gradual decrease in the consumption of ODSs. The implementation of above mentioned activities have the following impacts: (1) reduction and total phase out of consumption of CFC-12 through various efficient practices, (2) introduction of new and cleaner technologies in the RAC sector, (3) reduction in importing of CFC based equipment and better practices in the refrigeration servicing sector, (4) introduction of code of practices (the first time after restoring an independence), and (5) raised awareness of the end-users concerning ozone depletion and alternative technologies.

*Lessons learnt from previous activities*

NOU indicates that one of the important lessons learnt from previous activities is an establishment well structured links with governmental agencies dealing with economy,

industries, and trade as well as customs authorities, importers and consumers to introduce, execute and monitor activities in the field. Strong information exchange actions and networking at the national and international levels is an important factor for successes. At present, HCFC phase out activities are associated with new terms and businesses such as energy efficiency, carbon financing, ODSs (waste) disposal and others. It becomes apparent that links with other Multilateral Environment Agreements (MEAs), institutions and organizations should be further strengthened at the national level.

Another important aspect is refrigerants re-use scheme through recovery, recycling and reclamation as a technique of reducing emissions and supportive mechanism for phase out of CFCs which have been initiated in many countries including Georgia. At the moment, the main objectives of the centers are to recover and recycle CFC12 for continued use in existing ODSs equipment to avoid pre-mature decommissioning because of ban the import starting from 2010. However, the important observation is that R/R centers did not play an important role in the significant reduction of CFCs consumption in Georgia as it was initially foreseen. The lessons learnt are that the R/R centers may not be cost effective for small workshops and small and medium end-users until either the price of virgin refrigerant goes up or the cost of the scheme is subsidized. In this connection, it should be noted that Georgian Refrigerant Recovery and Recycling Centre (GRRRC) currently receives more orders for reclaiming HFCs than CFCs and HCFCs because of the high price of virgin HFCs at the market which is usually three times more than price of the same reclaimed refrigerant.

Furthermore, it should be highlighted that the most common replacement of CFC12 for new commercial and industrial refrigeration and air-conditioning systems was HCFC22. Besides, a considerable number of commercial blends based on HCFCs and HFCs are being used in Georgia. The consumption of these refrigerants is dramatically increased during the last few years. It is extremely important to provide permanent targeted information to stakeholders about phase out activities and availability of new technologies on the market.

It is important to highlight that small and medium-sized enterprises are key stakeholders involved in phasing out of CFCs during last ten years and will be main actors implementing phasing out of HCFCs in coming years. The experience in implementation of various activities revealed that end-users have difficulties in gaining access to appropriate alternative technologies and information on the availability assistance in the field. This limits an introduction of innovation technologies into the country and diminishes competitiveness of the private sector. At the same time, other constraints are identified as a lack of skilled technicians as well as uncertainty surrounding new technologies which restrict incentives to innovation.

The phase out activities of CFCs showed in Georgia that it is necessary to develop a comprehensive inventory of importers, end-users and service workshops for initiation of enforcement efforts in reducing the consumption of HCFCs, and for targeting priority sources. The data base allows establishing public-private partnership which is essential for initiating a strong dialogue with all players within the market. The partner of the NOU is the Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers (GARCAE) which greatly assists in the establishment of links with a private sector. In this regard, the strengthening of GARCAE's links with key international organizations in the RAC sector such as ASHRAE, IIR, AREA and others as well as partnership with similar associations under the

ECA network is vital for introduction and penetration of information on new technologies and better practices. It is also advisable to hold regular seminars for the private sector on legal, technical and financial matters associated with HCFC phase out.

The value of demonstration projects should be definitely pointed out. The logic of the demonstration activities indicates that successful alternative technologies tested during the pilot phase should be replicated by other companies operating in the field. Therefore, the aim of demo project in Georgia was to create awareness of end-user about available technologies and innovations and to demonstrate the benefits and advantages (energy savings, cost savings from purchasing fewer refrigerants, space availability, less incidents etc) of modern equipment to individual companies within the sector. The experience showed that demonstration projects are to be combined with intensive trainings and awareness campaigns to provide cost effective nation-wide dissemination of information about alternative technologies and phase out activities.

## **5. Data Collection and survey**

### *5.1 Description of Survey Methodology*

Data collection and survey for formation of the HPMP Strategy and Action Plan was carried by the end of 2009 and beginning of 2010. The analysis is based on:

- compilation, review and study of official documentation related to HCFCs import/export;
- collection of information directly from importers of refrigerants as well as equipment, distributors, manufacturers, service providers and end users.

The official data was obtained from the Ministry of Environmental Protection and Natural Resources of Georgia as well as from the national authorities responsible for the control of import/export of ODSs e.g. the Department of the Customs Control of the Service of Revenues under the Ministry of Finance of Georgia and the Department of Statistics of the Ministry of Economic Development.

The final conclusions and recommendations regarding the HCFC consumption in the country have been produced based on verification and analysing of the official data and data collected through questioning importers, distributors, manufacturers, service providers and end users.

### *5.2 HCFC Consumption: Sector Breakdown*

Georgia has never produced any kind of artificial refrigerants including HCFC hence the consumption of these substances is represented only by import. It should be underlined that about 98% of HCFC used in the country is HCFC22 and only 2% are HCFC142b, in heat pumps and service blends like R402, R409 and etc. which are used in commercial refrigeration mainly as alternative to CFC12.

As CFC-s have been phasing out the consumption of HCFC-s has sharply increased during the last few years. The major increase is observed in 2008 since the consumption has been tripled comparing the year of 2007. The reasons of such growth are: (a) the constant economic growth in the country and, consequently, growth in the per capita incomes, (b)

expansion of commercial and industrial activities due to sustained economic growth (introduction of industrial free zones in Georgia) and stabilization of energy supply in Georgia, (c) elimination of the consumption of CFC12 and extensive penetration of HCFC22 as cost-effective alternative, (d) much low prices of virgin HCFC22 in comparison with other major alternatives e.g. HFC134a and blends and, (e) expansion of import of low-priced equipment operating on HCFC. It is necessary to underline that in most cases owners purchase components for new refrigerating installation separately therefore charging the installation with refrigerant is done in place after the installation is mounted.

Dynamics of consumption of various refrigerants in Georgia is given in the following table. It is visible that the import of HCFC-s has increased from 19.58MT in 2004 to 106.84MT in 2008. However, it went down then in 2009.

Table 5.1: Data on the consumption of refrigerants in Georgia (the most recent years)

Year \ Refrigerant	HCFC-s	CFC-s	HFC-s
2009	71.20	0	38.90
2008	106.840	0	8,40
2007	32.50	2.70	7,60
2006	28.70	5.80	5.00
2005	20.24	8.18	3,778
2004	19.58	8.55	3,399

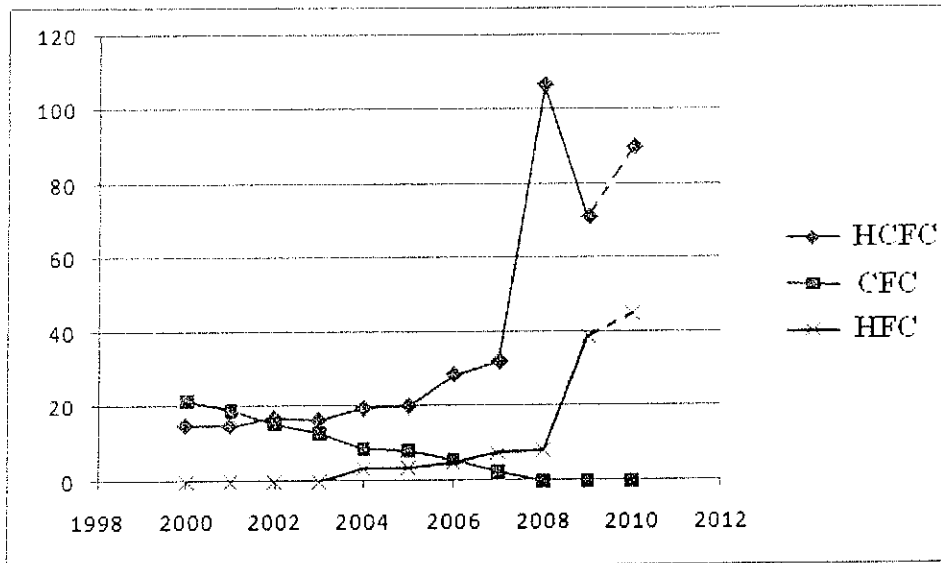
Source: the Department of the Customs Control, the Department of Statistics of Georgia

It is obvious that not all HCFC-s imported in the country in 2008 have been used. The part of them was used next year therefore the import decreased in 2009 by more than 35%. According to the data collected by the national experts through questioning of consumers of refrigerants the HCFC consumption has tendency of growth in comparison with 2000-2006 period (see graph 5.1). Therefore the demand for these substances also goes upwards and without implementation of corresponding activities, if the global availability and the cost of HCFC22 are stayed at the existing level, it is expected that HCFC consumption might be increased in coming years. The survey of HCFC consumption for the first five months of 2010 confirms this conclusion. 41MT of HCFC22 were used during this period. Taking into account experience of previous years the national experts assume that total HCFC consumption will be about 95MT in 2010.

The sector application includes air-conditioning systems, commercial refrigeration, cold storage systems and transport refrigeration. There is no HCFC consumption in two sub-sectors: domestic refrigeration and mobile air-conditioning.

Graph 5-1: Dynamics of import of various refrigerants in Georgia





Source: the Department of the Customs Control, the Department of Statistics of Georgia, Experts assessment

The largest segment for the consumption of HCFC-s is the air-conditioning sub-sector. The challenges can be summarised as follows: (a) all small self-contained air conditioners manufactured in the former Soviet Union used HCFC22 as their working fluid and large quantity of them is still in operation, (b) the new air-conditioning equipment operating on HCFC22 is mostly imported for the period of 2006-2008. As an example, the table 5-2 bellow shows that 36 889 air-conditioning units were totally imported in 2008 and 80% of them that is 29 500 units were designed for HCFC22 according to experts assessment and based on filled questionnaires of importers. This equipment is new and, consequently, the demand for the servicing will be occurred in coming years which can considerably increase the consumption of HCFC22 in Georgia.

Table 5.2: Number of refrigerating units imported during 2008

Name	Number of units. Official data	Number of units charged with HCFCs according to the survey among service companies and owners of the equipment
Air conditioning unit, with valve and compressors, others	810	650
Split A/C	36,889	29,500
Combined refrigerating and freezing cabinet, others	17,989	14,400
Domestic refrigerating cabinet, table type, compression	2,165	-
Others	1,449	700
Freezing cabinet, vertical max 900l, others	1,050	500
Refrigerated show case and similar	6,763	-

refrigerating units, others		
Heat pumps, compression, others	885	600
<b>TOTAL IMPORT</b>	<b>68,000</b>	<b>46,350</b>

Source: the Department of the Customs Control, National experts' survey

Before implementation of RMP and TPMP the commercial refrigeration sub-sector had been mainly represented by CFC equipment. The greater part of the equipment have been retrofitted or replaced from CFC12 to HCFC22. A number of activities were implemented through assistance of MLF. More information about this assistance is given in Table 5.3. As it is shown, 15 end-users received the assistance for changing their refrigeration systems from CFC12 to HCFC22 which enabled to reduce CFC dependence by 3,360.20 kg in total. In some cases owners of supermarkets have retrofitted their commercial units from CFC12 to R402A and R409A but those were single cases and consumption the HCFCs blends has never exceeded 150 kg in Georgia. Replaced commercial refrigerators such as refrigerating rooms, refrigerated chambers, display-cases and etc. have been mainly equipped with hermetic condensing units and the leakage is quite high because of obsolete equipment and poor maintenance. Moreover, new commercial refrigerators are mainly working on HCFCs at the Georgian market. Thus, a success of HCFC phase-out directly depends on elimination of releases in this sub-sector.

Table 5.3: List of end-users which received assistance from MLF to convert CFCs based equipment into HCFCs

N	Name of Organization	Ownership/Address	Date of retrofit/replace ment	HCFC installed capacity in kg
1	"Baia" Ltd	Georgian company/130, Rustavi avenue 0165 Tbilisi, Georgia	30-31 March 2004	27,50
2	J/S company "Lopota"	Georgian company/2 Besiki str. Telavi Georgia	24-25 October 2003	27,40
4	"Express-99" LTD	Georgian company/ 1 Mevele str. Tbilisi, Georgia	13-14 November 2003	33,60
5	J/S company "Sakagrobomretsvi"	Georgian company/Tabakhmela, Gardabani, Georgia	18-19 December 2003	1475,00
6	J/S company "Georgian blood preparation centre"	Georgian company/21a Kavtaradze str. Tbilisi, Georgia	25-26 November 2003	15,70
7	"BUKA" LTD	Georgian company/68 Kostava str. Tbilisi, Georgia	26-27 April 2004	111,50
8	"Pana-2000" LTD	Georgian company/135, Tsinamdzgvrishvili str. Tbilisi, Georgia	09-10 February 2004	953,00

9	"Iveria" LTD	Georgian company/21a Kavtaradze str. Tbilisi, Georgia	16-17 February 2004	62,00
10	"Dzveli Tbilisi" LTD	Georgian company/63 Kakheti Avenue Tbilisi, Georgia	19-20 February 2004	32,00
11	Individual enterprise "Givi Gamkrelidze"	Georgian company/16a Moscow Avenue Tbilisi, Georgia	10-11 February 2004	33,00
12	„Georgia-2" LTD	Georgian company/19 Gr. Lordkipanidze str. Tbilisi, Georgia	14-15 September 2004	175,00
13	„Linki" LTD	Georgian company/141 Rustaveli str. Kutaisi, Georgia	01-02 September 2003	129,00
14	„Iori" LTD	Georgian company/Tbilisi Sea apply territory Tbilisi, Georgia	25-26 November 2004	44,50
15	„Loma" LTD	Georgian company/1 Koberidze str. Gldani, Mtskheta district Georgia	30-31 March 2005	61,00

One sector where HCFC142b has been mainly used is the food industry. A number of heat pumps were used in dairy production and thermal processing of tea leaves. At many enterprises, a complex use of heat pumps is observed, in other words, the heat pumps concurrently worked in cooling regime for storage of tea leaves or dairy products and in heating regime for withering tea leaves or for pasteurization of milk. In the last case, a cascade heat pump working on ammonia and R142b has been used. It should be pointed that some of them are not currently operational but according to experts' assessment more than 1,5MT of HCFC142b were still used by several dairy plants in 2008.

### 5.3 Refrigeration Servicing Sector

In spite of fact that privatization of refrigeration servicing sector was practically completed the sector itself is still under development. About 30 private companies are involved in service of refrigerating and air-conditioning equipment. It is estimated that more than 1,000 technicians currently work in the country. Most of them are employed by the service and end-user companies but some of them work as independent technicians. It can be seen from the table 5.4 that the great part of refrigerants to be phased out in Georgia is found in the service sector.

One key element of the RMP and the TPMP for Georgia was to introduce good practices into the servicing sector to reduce the demand for CFCs through leak reduction and recovery. Successful phase-out of CFC12 in Georgia was mainly ensured through training of technicians, development of National Code of Practice, equipping main service companies with special tools required for a proper refrigeration and improvement of refrigerant re-use infrastructure. However the measures implemented did not promote reduction of HCFC consumption. On the contrary, the consumption of HCFC22 has grown sharply because low price and wide availability of HCFC22 made it the most popular refrigerant for service

companies and individual technicians. It should be underlined that in the RMP and the TPMP HCFC22 was considered as alternative refrigerant for retrofit/replacement of CFC equipment.

Table 5.4: Quantity of refrigerants used by different sectors in 2008

N	Consumer	Quantity of refrigerants in kg		
		CFC	HCFC	HFC
1	Service companies	300	78 640	4 500
2	Individual technicians	750	22 800	2 860
3	Small enterprises assembling commercial refrigerators	0	1 000	200
4	Wine producers	100	250	130
5	Soft drink producers	150	1 650	210
6	Public establishments (Museums, Libraries, Concert halls etc.)	200	2 500	500
	Total in 2008	1500	106 840	8 400

Source: National experts' survey

Another important aspect is that there are several large wineries and many small size private alcohol and soft drink producers in the country. The collected data allowed making the following conclusion:

- In general, large size wineries are completely or partially foreign enterprises. They have new equipment which rarely needs to be repaired. In case of problems with the equipment enterprises import spare parts and refrigerants themselves. The most used refrigerant is HCFC22;
- Medium and Small enterprises which are owned by Georgian citizens generally use old equipment operating on HCFC22. They have more problem with refrigerants leakage and usually they call outside technicians for assistance;
- The chillers are mostly used for air-conditioning. Some chillers mostly used by state organizations (museums, concert halls, libraries, etc.) are more than twenty years old and a large quantity of HCFC (about 2MT) is wasted through leakage from these installations. Private large companies mainly use new chillers that rarely needs to be recharged;

The table 5.4 gives also estimated consumption of the service companies and technicians which are regularly contracted by equipment owners for mounting adjustment and repair of installations.

Conversion from HCFC-s to alternative refrigerant especially to natural alternatives is more difficult in compare with CFC-HCFC transition. If conversion should be to natural alternatives these are all associated with risks (hydrocarbons are flammable and ammonia is toxic). Hydrocarbons that could technically be used in equipment designed for HCFCs after selecting proper oil and sometimes required design changes would not in most cases be safe to use in old leaking equipment that has not been designed for flammable refrigerants. The alternatives available if flammable refrigerants are considered as not safe options are two types of HFCs blends. Either the alternative developed for new oil requiring oil change like R407C or so called "drop in" or "service" blends that has been developed by many

manufacturers to make it possible to use none ODSs without oil change. All these activities require new competencies from the servicing sector to be applied without risks to people and equipment.

Therefore HPMP should promote improvement of professional skills of service technicians through training, demonstration project and other awareness raising activities covering flammability, toxicity and high pressure of alternative refrigerants.

#### 5.4 Refrigeration Manufacturing Sector

Production of commercial/industrial refrigeration equipment mainly covers production of medium temperature refrigeration equipment such as display cabinets and refrigerated chambers. It can be highlighted that there are five enterprises among others that permanently work in this field. List of the enterprises is given in Table 5.5. The produced equipment needs from 1 kg to 10 kg of HCFC22 refrigerants and the refrigerant is generally charged in after the equipment has been installed on site. There are no currently registration requirements for the use of refrigerants in the industry.

Table 5.5: List of the enterprises producing small size refrigerators

N	Name of Organization	Ownership/Address	Date of foundation	Type of equipment	HCFC equipment produced annually	HCFC consumption in 2008, kg
1	"Nino" Ltd	Georgian company/ 37, Agladze str. Tbilisi, Georgia	August, 1998	Display-cases	110	480
2	"Orgtechnica" Ltd	Georgian company/ 1 Gugunava str. Kutaisi, Georgia	April, 2007	Display-cases	70	260
3	ICES Group	Georgian company/ 14 Iumashev str. Tbilisi, Georgia	March, 2008	Refrigerating rooms	18	185
4	Individual Enterprise "Teimuraz Bajelidze"	Georgian company/ 102 Melikishvili str. Batumi, Georgia	March, 2001	Cooled coffins	10	36
5	Individual Company "Viacheslav Gogsadze"	Georgian company / 11 Meskhishvili str., Rustavi Georgia	December , 2005	Refrigerating rooms	5	39
TOTAL					218	1 000

Compressors for display cabinets and refrigerated chambers are mainly imported from China, Brazil, Spain and other countries. It is important to highlight that none of companies have been assisted so far under the Montreal Protocol.

#### 5.5 Installed quantities of HCFCs in Georgia

As mentioned above, there are a lot of imported commercial, industrial and transport refrigeration equipment operating on HCFC22 and its blends. Moreover, many old HCFC installations operate in food industry, hotels, hospitals etc. One of the largest shares of HCFC22 based equipment belongs to air conditioning units (window, split, etc).

Table 5.6: Sectorial HCFC consumption for 2008

	Estimated number of units	Estimated number of units totally refilled and/or topped up per year	Estimated total HCFC use in tone
Commercial refrigeration	50 000	15 000	33.0
Split and unitary A/C systems	70 000	14 000	21.0
Industrial/Cold stories	9 560	2 390	38.24
Chillers	400	160	14.6
Total:			106.84

#### 5.6 Forecast for HCFC use

It should be pointed out that an annual growth rate in demand forecasted by consultants for HCFC22 of 10% from 2009 until 2020, it is estimated that the consumption of HCFC22 in Georgia is likely to be tripled (up to 233.4MT) by 2020. Georgia imports HCFCs from a number of countries such as China, Emirates, Turkey, Singapore, Ukraine, Spain, and India. As long as HCFCs remain available in the producer countries, Georgia does not expect difficulties in importing HCFCs in the nearest future.

The HCFC consumption forecast for Georgia with and without implementation of the Montreal Protocol for the years until 2020 are presented on the Graph 5-2. Baseline consumption is accepted as 83.9MT. It has been determined by averaging 2009 (71.2MT) and 2010 (96.5MT) consumptions. Meantime, 2010 consumption has been given by the national experts based on extrapolation of survey data of the first five months of this year.

Graph 5-2: HCFC consumption forecast 2020

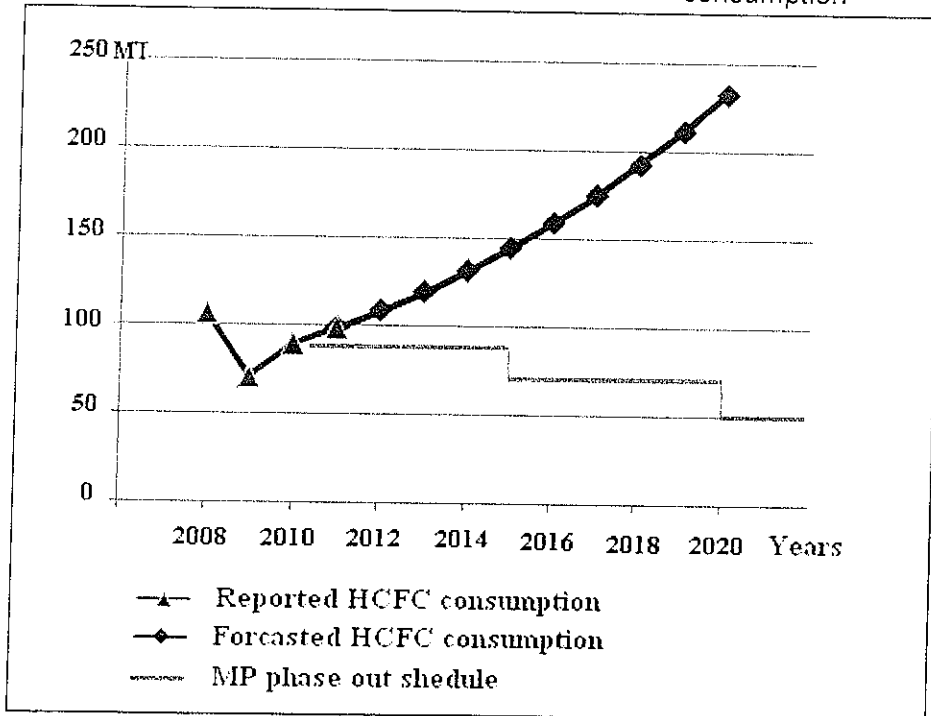


Table 5.7 Assumed HCFC consumption growth rates (two scenarios)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Increase, %		-33	35.5	6.7	8	8	10	10	10	10	10	10	10
Without implementation of MP	106.84	71.2	96.5	103	111	119.8	131.8	145	159.5	175.4	192.9	212.2	233.4
Increase, %						baseline		baseline					baseline
With realization of MP measures	106.84	71.2	95.0	91.2	87.5	83.9	79.7	75.5	69.5	64.6	60.7	57.0	54.5

### 5.7 Availability of alternatives to HCFCs and prices

The main present challenge for the country is to stop growing demand on HCFC22 by 2013. Certainly, Georgia should urgently develop HCFC Phase out Management Plan in order to meet 2013 and 2015 requirements of the Montreal Protocol. The high demand on virgin HCFC22 can be decreased through introduction of economic and other incentives to recover and recycle used refrigerants. The problem is that as long as virgin HCFC22 price is lower than other alternatives it is difficult to motivate end-users and other stakeholders to purchase recovered and recycled HCFC22.

It is clear that the most long-term alternatives to HCFC-s are natural refrigerants but it is necessary carefully evaluate the use of natural refrigerants because of their flammability, toxicity and high pressure. The wide introduction of HC-s and CO<sub>2</sub> should be encouraged only after realization of the appropriate training programs for the service centres and end-users and in case they are equipped with proper tools and safety means. There is different situation with ammonia because ammonia refrigeration has a long history in Georgia. The large industrial refrigerators still work on ammonia in the country but all of them are very old and their installed capacity accounts tens tons of refrigerants in total. The effectiveness of installations is low and various accidents often take place on sites. By this reason end-users try to avoid using ammonia installations. Several central ammonia refrigerating systems have been replaced by stand-alone refrigerating units working on HCFC22. It is understood that ammonia is one of the best natural alternative refrigerant to HCFC-s. It is very cheap and available in Georgia (There is production of ammonia in the country). Therefore the trust of end-users and service companies to ammonia systems can be rebuilt through increase of their awareness, training of personnel and implementation of projects demonstrating safety, efficiency and small installed capacity of modern ammonia installations.

The selection of alternatives for HCFC22 is a difficult and complex task. The clear understanding is that alternatives should be non-ODSs and non-GHG refrigerants (e.g. HFCs) and technology should be economically feasible and mature. One of the directions can be wide introduction of natural refrigerants since they have no global environmental harm (currently known). However, as it is well known natural refrigerants are not commonly applicable alternatives because of safety problems such as the toxicity and flammability. Therefore, the application of natural refrigerants is still limited in Georgia and will be probably partial in the near future.

Another important point is a current average retail market price for CFC12, HCFC22 and HFC134a in Georgia which is presented in the table below.

Table 5.8: The current retail prices of refrigerants in Georgia

Refrigerants	Current price (in USD)
CFC-12	30
HCFC-22	10
HFC-134a	20
R-404A	30
R-410A	35
R-507A	38

Currently, the cheapest refrigerant is HCFC22 for about 10 USD per kg and the price is slowly decreasing. Substitutes for HCFC22 are available within Georgian market but they are not commonly used. The prices of substitutes vary between 20 USD to 38 USD per kg and consist mainly of blends of HFCs.

### 5.8 Solvent Sector

The data collection illustrates that HCFC-142b as a solvent is consumed in the dry cleaning processes in Georgia. Dry cleaners have traditionally used ozone depleting solvents including CFC113 and 1, 1, 1-trichloroethane during the soviet time. After collapse of the Soviet Union,



the main solvent used in the sector is HCFC142b. In the past, there were two large state companies - "Tetroni" and "Tolia" which had branch offices of dry-cleaners all over the territory of the country. A number of various soviet origin machines for chemical cleaning were used by the dry-cleaners. The most widespread were "Raduga9M" and "Raduga20" which could process various types of garments such as suede, leather and some delicate fabrics.

On the basis of the state companies, a number of private companies were established which continue currently working on this sector. The list of the companies with relevant information is provided in the table 5.8. According to the data collected by the national consultant, there are approximately 2,000 cleaning facilities in total and 10 metric tons of HCFC142b was consumed by 14 companies in 2009.

Table 5.9: List of the HCFC solvent consumers

N	Name of Organization	Ownership/Address	Year of foundation	Type of equipment	Number of unite	HCFC consumption in 2009, kg
1	"Vake-Kimtsmenda" Ltd	Georgian company/ 47 Paliashvili str. Tbilisi, Georgia, tel.:+99532251696	1998	"Raduga20"	2	1 400
2	Individual Enterprise "Barnabi Nizharadze"	Georgian company/ 67 Ninoshvili str. Tbilisi, Georgia, tel.:+99532958270	1972	"Raduga9M"	1	700
3	Individual Enterprise "Sergo Lezhava"	Georgian company/ 26 Kutaisi str. Zestafoni, Georgia, tel.:+99595716371	1991	"Raduga9M"	1	500
4	Individual Enterprise "Koba Japaridze"	Georgian company/ 32 Saburtalo str. Tbilisi, Georgia, tel.:+99590601737	1998	"Raduga9M"	1	500
5	Individual Enterprise "Ushangi Kirikashvili"	Georgian company / 36a Kazbegi str., Tbilisi, Georgia	1962	"Raduga20"	1	800
6	Individual Enterprise "Marenii"	Georgian company / 9 Bagdadi str., Tbilisi, Georgia, tel.:+99532748680	1995	"Raduga20"	3	1 200
7	"Tbisi" Ltd	Georgian company/ 8 Mtskheta str. Tbilisi, Georgia, tel.:+99532292992	1999	"Raduga20"	1	1 000

8	Individual Enterprise "David Kharchilava"	Georgian company / 25 Vazha-Pshavela ave., Tbilisi, Georgia, tel.:+99532381468	1995	"Raduga9M"	1	400
9	Individual Enterprise "Tamaz Chirakadze"	Georgian company / 1 Chavchavadze ave., Kutaisi, Georgia, tel.:+99599746991	1995	"Raduga9M"	1	500
10	Individual Enterprise "Jemal Gumberidze"	Georgian company / 3 Bakradze str., Tbilisi, Georgia, tel.:+99599989167	2005	"Raduga20"	1	800
11	Individual Enterprise "Dima Chitanava"	Georgian company / 73 Javakhishvili str., Tbilisi, Georgia, tel.:+99598192273	2007	"Raduga20"	1	700
12	"Belisimo 555"Ltd	Georgian company/ 5 IV district, Rustavi, Georgia, tel.:+99599578797	2009	"Raduga9M"	1	300
13	Individual Enterprise "Shalva Benidze"	Georgian company / 51 Tsereteli ave., Tbilisi, Georgia, tel.:+99599352956	1995	"Raduga20"	1	700
14	"Real Invest"Ltd	Georgian company/ 29a Kazbegi str., Tbilisi, Georgia, tel.:+99599413432	2007	"Raduga9M"	1	500
TOTAL					17	10 000

It is well known, that primarily, in dry cleaning, a solvent is used instead of water. It is "dry" only in the sense that it is not wet with water. A dry cleaning machine is composed of a stainless steel basket that contains and rotates the garments. Unlike the ordinary laundry where the clothes are immersed in the water, the dry cleaning machine drops a small quantity of solvent to the rotating basket. The solvent gushes through the clothes fibers and absorb stains and soil contents. Then, the cloth is pumped out of the machine and it is filtered. Finally, the garments are circulated again when they are cleaned to drain the solvent.

It is important to underline that all dry cleaning units are closed loop machines with built-in refrigerated condensers operating on HCFC22. A closed-loop machine does not vent solvents to the atmosphere but continuously recycle throughout the dry cleaning cycle. The air exchange with the atmosphere only occurs during loading and unloading. In spite of this fact the losses of solvent is very high because of old technologies.

The national consultant reported that some new dry-cleaners are equipped with new units working on non-ODSs solvents. The non-ODS equipments are more energy efficient and there are no much losses of solvents during operation. However, these units are extremely expensive and, consequently, the use of modern equipment is limited and could not find wide application in Georgia. Furthermore, representatives of the sector highlighted that non-ODS solvents are volatile organic compounds (VOC) and the application of some alternatives (ex. Perchloroethylene) are to be prohibited because of health and safety concerns.

It is also important to observe that the cost of various solvents is approximately at the same level.

Table 5.10: Current retail prices of solvents in Georgia

Solvents	Current price (in USD)
HCFC-142b	8
Perchloroethylene	10
Trichloroethylene	9

One of the main challenges of the sector is that there are a few quality standards, and manufacturers often give insufficient attention to care labeling. There is a general lack of understanding of optimum cleansing procedures among clothing manufacturers, retailers and consumers, and sometimes also among dry-cleaners as well. Therefore, there is also a lack of employees' awareness. The solvent sector requires assistance to improve environmental performance and address safety and health aspects.

The survey shows that any substitute for HCFC142b should meet the following criteria since it is important to address environmental, health and safety concerns without compromising on quality and cost effectiveness:

- Non-ozone-depleting substance (non-ODS)
- Low or No GWP
- Non-carcinogenic
- Low toxicity
- Non-flammable or low flammability
- Good cleaning efficacy
- Compatible with substrate material (e.g. non-corrosive, non-abrasive)
- Not leaving any residue
- Equal or lower cost compared to HCFC142b
- Locally available
- Can be disposed off easily

The proposed measures for phase out of HCFC142b in the solvent sector are given in the next chapters.

## 6. Strategy for HCFC Phase out Management Plan

### 6.1 Overall strategy for phase out of HCFCs

The overall strategy for phase out of HCFC in Georgia can be summarized as follows:

- Implementation of international obligations of the country under the Montreal Protocol on phasing out its HCFC consumption in accordance with the phase out schedule of the Montreal Protocol.

It should be emphasized that Georgia has never produced any kind of artificial refrigerants and solvents and the consumption of virgin substances including HCFCs fully depend on their import. It means that without implementation of appropriate activities directed to gradual phase out of HCFCs, Georgian consumers will face challenges in servicing their HCFC equipment.

In this regard, the HPMP Georgia has been developed in two staged approach. The first stage of the planned activities covers the period from the year 2011 to 2020 and the second stage is related to the period 2020 – 2040. The first stage of the HPMP covers commitments to freeze HCFCs consumption in 2013 (base level - annual consumption in 2009-2010) and to reduce HCFCs consumption by 10% in 2015 and 35% in 2020. The Second stage (2020-2040) will include implementation of various activities to meet commitments of 2025 (67.5% reduction), 2030 (97.5 reduction) and keeping an allowance of 2.5 percent of the baseline consumption for meeting servicing needs till 2040. Finally, Georgia will totally phase out the consumption of HCFC142b in the solvent sector by 1 January of 2016.

### *6.2 Objectives*

In compliance with the overall strategy under the Montreal Protocol, the main objective of the HPMP is an initial freeze and then progressively reduction of HCFCs consumption in refrigeration and solvent sectors while minimizing economic and social impacts.

Specific objectives of the HPMP can be summarized as follows:

- Update of the current regulations, legislation and a licensing (permitting) system to support the phase-out by strengthening the control of the use of HCFCs, control of service methods and equipment containing ODSs, and improvements in the certification system for technicians.
- Stabilization and 10% reduction of the consumption of HCFCs in the refrigeration sector by various activities such as training on good practices, updating code of practice, customs training etc.
- Total phase out of HCFC142b consumption in the solvent sector.
- 35% reduction of the consumption of HCFCs in the refrigeration sector by technical assistance in the servicing sector and implementation of end-user Retrofit Pilot Incentive Programme
- Establishment of the necessary framework for management, monitoring and awareness-raising in relevant sub-sectors coordinated with the country's climate change, chemical management, and energy policies.

### *6.3 Expected impact of HPMP*

The HPMP will assist Georgia to achieve the phase out of HCFCs according to provisions of the Montreal Protocol. The expected phase out of HCFCs from measures detailed in the HPMP is shown in Table 5-7 and Graph 5 -2 above. It is evident that without implementation of the HPMP it is practically impossible to decrease consumption of HCFC22 and HCFC142b. One of the most important outputs of HPMP will be reorientation of the legislation system, trainings and infrastructure established under the TPMP from CFCs to HCFCs.

The introduction of the Import Quotas on HCFCs will entail considerable growth of prices for HCFCs and will decrease their availability. In such circumstances, the demand for qualified technicians who have a good knowledge of alternative technologies will be definitely growing.

Furthermore, HPMP will have a direct impact on further promotion of recovery and reclaim technologies. The proper operation of recovery and reclamation scheme in the country will raise a possibility to service HCFC equipment beyond 2020. This will ensure that the equipment does not have to be scrapped before the end of life. Certainly, the extended lifetime of the equipment will need refrigerants but HPMP activities will help decreasing the need for virgin chemicals because of R/R centres operations and proper services in the refrigeration sector. Therefore, the re-use scheme will be resulted in the long term benefits for Georgia in decreasing the consumption of HCFCs.

In addition, it should be noted that through the demonstration projects to use natural refrigerants, the destruction of collected ODSs in a cost effective way and the technical assistance in the solvent sector the HPMP will impact on future development of RAC and solvent sectors. All these activities will ensure awareness rising of end-users and service companies and promote introduction of cost-effective, energy efficient and environmentally acceptable alternative technologies.

#### *6.4. Potential financial incentives and opportunities for additional resources*

Georgia will explore the possibilities to link activities under HPMP with the GEF Climate Change Focal Area. The new System for Transparent Allocation of Resources (STAR) was introduced by the GEF in 2010. During GEF-5, Georgia will receive individual indicative allocation under the Climate Change Focal Area which is about 2.3 mln USD. One of the objectives of Climate Change Focal Area of the GEF is to promote market transformation for energy efficiency in the industry and building sector. Georgia will explore possibilities to link the HPMP implementation with one of the project in energy efficiency which the country would develop under the GEF-5.

It is also expected to promote and demonstrate ways to more systematically engagement of the private sector in order to foster innovation, open and develop new markets, and demonstrate the potential for strategic partnerships to achieve a greater scale of investments than generally achievable through the implementation of HPMP. Furthermore, the private sector would play a participatory role in training and other project implementation activities. Georgia will explore the ways how to mobilize private capital into components of HPMP and promote technologies and business models that will contribute to the protection of the ozone layer and mitigation of Climate Change and, consequently, promote environmentally sound and sustainable economic development.

## **7. Main Components of HPMP (freeze, 10% and 35 % reduction)**

### **7.1 Component 1: Policy, Regulatory and Institutional Support**

Georgia legislation system covers ozone relating issues throughout a number of regulatory acts and the licensing (permitting) system was introduced in May of 2002. The licensing (permitting) system covers all ODS (Annexes A, B, C and E) and has been coordinated among the concerned authorities, namely: the Ministry of Environment Protection of Georgia, the Customs Department under the Ministry of Finance of Georgia and the Statistics Department of Ministry of Economic Development of Georgia. The important role plays the

Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers which provides consultancy assistance to the Ministries regarding technical issues.

One of the important regulatory measures to be introduced is an application of Import Quotas on HCFC22. Georgia will introduce quotas according to the phase out schedule of the Montreal Protocol in order to comply with its targets:

- ✓ **Baseline:** Average 2009-2010 consumption
- ✓ **Freeze at baseline level:** 2013
- ✓ **10 % reduction:** 2015
- ✓ **35% reduction:** 2020
- ✓ **67.5 % reduction:** 2025
- ✓ **Total Phase out:** 2030 except 2.5% for servicing use: up to 2040
- ✓ **100 % reduction:** 2040

Once the technical assistance programme is completed in the solvent sector, Georgia will ban the import of HCFC-142b into the country starting from 1 January of 2016. This measure would help Georgia complying obligations under the Montreal Protocol.

Under the registration and licensing system, persons or companies who wish to import HCFCs into the country should follow the subsequent steps:

1. To be registered at the Ministry of Environment Protection of Georgia;
2. To apply for the license (permit) at the Ministry of Environment Protection of Georgia;
3. Obtain/possess the quota to import the Hydro-chlorofluorocarbons (HCFCs) for local consumption.

The exact figures for the quota system will be determined at the later stage when the official consumption for 2009 and 2010 is identified.

Another important regulatory measure would be the introduction of import quota for new equipment containing HCFCs. According to the survey from 2006-2008 there is a significant annual increase of import of equipment containing HCFC22. Since this import increases the installed quantities of HCFC22 in the country, subsequently the need for HCFCs will also increase. Currently, Georgia does not require permitting or licensing of HCFC containing equipment. This was not considered critical during phase out of CFC12, but will be a necessary tool for HCFC phase out activities. The Government intends initiating the establishment of an import quota system on HCFCs containing equipment to avoid boosting an additional HCFC demand. Since this activity is considered as a complementary regulation, the concept note for associated legislative acts is to be first considered and endorsed by the Government office and, afterwards, the legislative acts can be developed by the Ministry and submitted for approval. The baseline to limit the number of import units of new equipment containing HCFCs should be established based on the import quantities of 2009 and 2010 and then steadily reduced. The concrete years and figures will be determined at the later stage when the special market study will be carried out.

Georgia would be willing to introduce a ban on import of used HCFC Equipment since international trade is not only about new products. A wide variety of second hand refrigerators

and A/C equipment are also sold on international markets. Most used goods are imported into A5 countries (including Georgia) operating under the Montreal Protocol. Without introduction of restrictions on HCFCs second hand equipment, Georgia will be vulnerable to an additional increase of HCFC based equipment requiring servicing in the longer term and raise the unnecessary demand on HCFCs within the country.

One important aspect is that the Ministry currently works on the development of Environmental Code which will be a set of regulatory measures combined in one document to promote people's health and safe environment through safeguarding biological diversity, utilizing culture-historical values, preserving the ecosystem's long-term productive ability as well as air protection, waste management, water management and other issues. It is expected that the introduction of the Environment Code would further increase authorities' responsibility for the environment. Therefore, ozone related regulatory measures should be also included into the Environment Code in order to ensure implementation of obligations taken by Georgia under the Montreal Protocol.

It should be emphasized that the Georgian Presidential Decree on the Control of Ozone Depleting Substances in Georgia (enacted in May 2002) controls the consumption of CFC in Georgia. The Decree mandates the authorities to put requirements on the industry related to handling of CFCs and service of systems containing CFCs. It is important that the decree will be updated to regulate and coordinate the consumption of HCFCs and, desirably, HFC gases as well. The following areas need to be considered under the revision of the decree:

*(1) Improvements in the certification system*

The aim of certification technicians working in the industry is to ensure that they have required competencies to work with HCFCs and HFCs in an environmentally responsible manner that minimizes emissions. Other activities would include: (a) clarifying the certification requirement of service technicians for repair of domestic and commercial refrigeration and air-conditioning equipment operating on HCFCs and HFC, (b) certification of companies/technicians on the basis of data on registration, technical equipment and employment of certified service technicians. It is also important that the Code of Practices will be updated since at present it mainly focuses on CFCs equipment. Less or no attention is given to other refrigerants such as HCFCs, HFCs and especially natural refrigerants. Finally, the Code of Practice does not cover good practices in the air-conditioning sector.

*(2) Control of service methods and equipment containing ODSs*

It is important for Georgia to consider the following activities in the servicing sector for control service methods and equipment containing HCFCs which are in line with EU requirements:

- General obligation to prevent leakage through application of all measures which are technically and economically feasible. Therefore, operators must: (i) prevent leakage of HCFC refrigerants and (ii) as soon as possible repair any detected leakage.
- Regular Leak Testing should be introduced. Plants must be checked for leakage by certified personnel on a regular basis.
- Maintaining records which are to be kept about each system with more than 5 kg of HCFC refrigerants.

- Ban on charging systems designed for non HCFC with HCFC, e.g. ban "backwards retrofits";
- Ban on intentional venting
- Ban on installation of HCFC equipment in new locations; and ban of "top up" systems without leak detection and corrective measures.

In planning proposed measures, it is recognized that Georgia will not be able to introduce all measures immediately and at the same time when particularly they may have significant social and economic implications.

Table 7-1: Cost for Policy, Regulatory and Institutional Support

Description of activities	Budget in USD
National consultants for development of the legislative acts	8,000
Two national workshops	2,000
<b>Sub-total</b>	<b>10,000</b>
<i>Contingency 10%</i>	1,000
<b>Total</b>	<b>11,000</b>

## 7.2 Component 2: Training, Capacity-building and Awareness

### 7.2.1 Updating a Code of Practice

Georgian Code of Practice for the refrigeration servicing sector was developed through assistance of the TPMP in 2008. It is the Georgian registered standard (SST70) which gives provisions for good practices, safety and environmental requirements in servicing of refrigeration systems and heat pumps. The document is the first national regulations in this field and, consequently, it considered as an important component of the country's ODSs phase-out policy and strategy.

However, the Georgian Code of Practice for the refrigeration servicing sector mainly focuses on CFCs equipment. Less attention is given to other refrigerants such as HCFCs, HFCs and especially natural refrigerants. Moreover, this standard does not cover a code of good practices in the air-conditioning sector.

Based on the above mentioned and taking into account that Georgia has successfully met its commitments under the Montreal Protocol regarding phase out of CFCs it becomes apparent that the current Code of Practice should be further updated to facilitate a smooth reduction in HCFC consumption.

Benefits from the updated Code of Practice would be as follows:

- backing up the reduction of HCFC consumption in a cost-effective manner;
- assistance in the smooth transition from HCFC to non-ODS and low GWP technologies;
- adoption of proper servicing and maintenance practices in air-conditioning sector which is the largest sector of HCFCs consumption in Georgia; and
- adoption of safety handling of natural refrigerants and other alternatives.

### 7.2.2 Training on good practices in the refrigeration sector



The objective of the component is to reduce the consumption of HCFCs in the refrigeration sector by training technicians in good practices in refrigeration and air-conditioning sectors and to assist Georgia comply with freeze and 10% reduction in HCFCs consumption under the Montreal Protocol. In spite of the fact that the Training programme has been successfully implemented in the country under RMP and partially covered by TPMP there is a considerable shortage of skilled trainers as well as technicians in Georgia.

It is important to take into account that the industry should move step by step from HCFCs to HFC (with high GWP), Hydrocarbons (flammability), CO<sub>2</sub> (hi pressures) and Ammonia (toxicity) and, therefore, refrigeration technicians should be provided with the relevant information and skills allowing them to handle the transition period through increased focus on energy efficiency (with more complex solutions) to reduce carbon footprint.

***The expected results from this component include:***

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- Training of 10 future trainers in F-gases and natural refrigerants
- Training of at least 150 refrigeration technicians from various regions of Georgia;
- In total, 15 national workshops will be organized including one for trainers.
- Training for assemblers of HCFC equipment (2 workshops)
- Raise awareness of end-users and other stakeholders about the need to move away from HCFCs and introduction of new technologies in the field.

It is also essential to show linkages between environment and economic benefits of good servicing practices in the RAC sector.

### *7.2.3 Training of future technicians and further strengthening of vocational schools*

The current policy of Georgia is to establish comprehensive system of professional education which can contribute to the national economic and industrial development. The main goal of the ongoing reform is to create market driven vocational and career education with significant impact on the development of the country. The goal will be achieved through creating the system of training and re-training targeting small and medium business as well as attracting citizens with retraining and improving their skills. In this regard, the Georgian law on professional education was adopted by the parliament of Georgia on 28 March of 2007 and, consequently, it regulates the main aspects of reforms.

Three vocational schools which are located in Tbilisi, Kutaisi and Kobuleti were selected as training institutions for future technicians in the refrigeration field under TPMP. The schools were equipped with modern tools/training equipment, four manuals in Georgian language were published and a special training programme was developed through assistance of the project. Moreover, three best students were awarded with professional internship in Germany. However, the current economic development of the country requires having more skilled workers in the refrigeration and air-conditioning sector. A lack of skilled technicians greatly affects modernization of the business resulting in high energy consumption, frequent industrial accidents and, consequently, complaints of end-users.

Therefore, it is proposed to continue the strengthening of vocational schools since fully equipped laboratories and modern curricula are extremely important to ensure high quality education in the RAC sector. It is important to gradually improve the training system in particularly high quality vocational training to cover all competencies required to work in the future industry to create energy efficient, safe and reliable systems. The modern training

equipment is to be delivered in order to ensure practical work sessions as important components of vocational education on the good practices in the refrigeration sector. Furthermore, the new training module should cover recovery and recycling of F-gases, retrofitting to alternative refrigerants and the introduction of new ozone and climate friendly technologies such as hydrocarbons, ammonia and carbon dioxide. Most students must be able to handle a wide range of problems relating to refrigeration and air conditioner systems and equipment manufacturing after completion of courses.

Another important aspect for Georgia is to establish proper linkage of future refrigeration technicians with industries which can be efficiently done through the assistance and involvement of the Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers. At present there are weak linkages with private sector and other institutions. The need to strengthen ties with local industry is very strong in order to (1) provide proper on-the-job training to students and (2) to attract end-users to employ skilled technicians in the future. One important feature is that activities can also help raising awareness of potential students regarding the comprehensive professional refrigeration education in Georgia.

#### *7.2.4 Training of Customs officers to monitor HCFC import-export*

The training sub-component for customs officers is very important part of HPMP for enforcement of the national regulations through the effective system of identification and detection of ODSs at the borders. A strict control of imports of ODSs at the borders enables the country to prevent entering of banned products. For this purpose, customs officers must have adequate training to enable them to be able to identify illegal import of HCFCs and other ODSs. In this regard, one of the significant challenges is customs staff turnover in Georgia. Therefore, it is exceptionally important to keep knowledge and awareness of customs officers constantly updated.

The training aims to reinforce capacities of customs officers to monitor import-export of HCFC and other ODSs in Georgia through providing officers with necessary practical skills and knowledge in identifying different types of refrigerants and blends. It is important to enable customs officers to get acquainted with the ODS regulations and other legislation regarding ozone issues and create awareness amongst customs officers on their role in enforcing Montreal Protocol at the national level. One of the important additional aspects is to prevent illegal imports of CFCs to allow Georgia maintain its zero consumption status.

The implementation of training sub-component for customs officers helps ensuring better identification and control of the ODSs at the borders, increasing awareness level of Customs Officials on HCFCs based refrigerants including blends, enhancing reliability of data on import and export of HCFCs and, preventing illegal import of ODSs into Georgia. In total, there will be trained 200 customs officers from the Customs Department through 10 national workshops. It is proposed also to update software for customs officers as well as a pocket leaflet which are essential tools to update the knowledge of customs officers regarding requirements of the Montreal Protocol and to achieve sustainability of activities in the field.

#### *7.2.5 Strengthening the Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers*

The Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers were established in 1999. This Association is a unique organization in Georgia which brings together service companies, end-users, scientists and technicians in the refrigeration and air-

conditioning sector. Furthermore, it helps setting up links among public and private sectors in order to promote new internationally accepted standards, practices and guidelines in RAC sector.

Since its establishment the Association has proved to have been the most substantial promoter of activities for enhancing the knowledge and skills of technicians through good practices in the refrigeration sector. However, it becomes presently apparent that the Association needs to be further strengthened in order to overcome new challenges in introducing alternative technologies to HCFCs as well as avoiding wide-spread use of HFCs as substitute refrigerants.

It is proposed to utilize the Association as the communication, information exchange and knowledge management platform to enhance access to the technology and policy information at the national level. The web-site will be introduced which allows effective information flow regarding HCFC alternatives, news, tools, R/R centre activities etc. Further improvement of the awareness and skills of refrigeration technicians will be ensured through organization of two conferences (2012 and 2017) on technology innovations in the RAC sector and promotion of their involvement in the work of regional and international networks.

At the same time, the association will continue its contribution towards sustaining the CFC phase-out already achieved and will further promote new clean technologies taking into account climate change benefits. It is expected that the capacity building efforts will be resulted in the promotion of the harmonization of policies, legislation and standards in Georgia as well as in enabling the association to be engaged in policy dialogue/advocacy and facilitate public-private partnership. Finally, the strengthening of the association would certainly contribute to efforts of the country to decrease the consumption of HCFCs according the Montreal Protocol targets.

#### *7.2.6 Targeted information*

The successful implementation of HPMP requires the co-ordination of activities in different sectors including manufacturing, servicing and end-users as well as at different levels including regulatory, policy and trade officers, refrigeration technicians, customs and enforcement officers, ensuring operation of recovery and recycling programmes and raising public awareness of the ozone and climate related issues. The most important is that the targeted information should cover broad range of refrigeration industry stakeholders who seek to improve the safety, efficiency, and productivity of industrial refrigeration systems. A primary target group under the first phase of HPMP is refrigeration end-users such as food processors, cold storage warehouses, supermarkets etc. Other stakeholders can include equipment manufacturers, energy service companies, and governmental agencies.

Targeted awareness campaign will increase the pressure on conservative stakeholders to change their way of doing business. Well-informed customers will be important to generate a market for ODS-free equipment and for improved services. The occasion when most consumers are interested in and will need to deal with ODS related issues is when they buy or service their car, refrigerator or air-conditioning system. The information campaign should help end-users to select new equipment that leads to reduced energy costs, minimized environmental impact, increased reliability and reduced maintenance costs. The same will also be true for many professionals that have refrigeration and air-conditioning systems in their buildings, shops, restaurants, hotels, hospitals and industries. General information in the media can play a certain role in the phase-out, but it will be targeted information for different consumers or users that will be the most important. Information that is targeted towards

selected groups can be more specific, which increase the relevance and therefore, the audiences' interest in it. The activity will be fully covered by IS project.

Table 7-2: Cost for Training, Capacity-building and Awareness

Description of activities	Budget in USD
<i>Updating a Code of Practice</i>	
National consultants	3,000
Targeted information material	2,000
Printing and distribution	1,600
<b>Sub-total</b>	<b>6,600</b>
<i>Training on good practices in the refrigeration sector</i>	
Arrangements of 15 workshops (including one for trainers)	15,000
Arrangements of training for assemblers of HCFC equipment (2 workshops)	3,000
Reproduction of documents	4,000
<b>Sub-total</b>	<b>22,000</b>
<i>Training of future technicians and further strengthening of vocational schools</i>	
Update and production of training materials	5,000
Equipment for 3 Training Centres (approx from 5,000 USD/school)	15,000
Internship for best students (3 students)	5,000
<b>Sub-total</b>	<b>25,000</b>
<i>Training of Customs officers to monitor HCFC import-export</i>	
Training program, 10 workshops	10,000
Update of software, training materials and information leaflet	3,000
<b>Sub-total</b>	<b>13,000</b>
<i>Strengthening the Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers</i>	
Establishment of comprehensive web-site	5,000
Organization of conferences on technology innovations in the RAC sector (3 meetings)	9,000
Production of two leaflets about HCFC alternative technologies in Georgian language	4,000
<b>Sub-total</b>	<b>18,000</b>
<i>Targeted information</i>	
Awareness campaign will be covered by IS project	0
<b>Sub-total</b>	<b>0</b>
<i>Contingency 10%</i>	<b>8,460</b>
<b>Total</b>	<b>93,060</b>

### 7.3 Component 3: Demonstration projects

#### *Demonstration Projects to use natural refrigerants*

Retrofits and replacement of existing equipment to non-ODS and zero GWP technologies will play an important role to gain ozone and climate benefits from proposed activities. HPMP will support a number of demonstration projects in the RAC for application of current natural

refrigerant technologies. There is a need to execute demonstration projects to build a local practical experience and confidence of end-users. Equipments and/or installations that are typical for the Georgian market should be selected to create "Case Studies". These case studies should contain documented methods and results that can be published for interested technicians and equipment owners to use when retrofits or replacements are discussed. Without support for this work it will be more difficult to initiate early retrofits and replacements in Georgia.

The Ministry/NOU of Georgia and UNDP will decide on the selection criteria and modality of this activity, taking into account the experiences of previous end-user project and TPMP activities which have been successfully implemented. In order to inform equipment owners of the possibility to participate in the demonstration project an information workshop will be arranged. This will also be an important component of the awareness raising activities. One important selection criteria should be that the equipment owners allow study visits from other stakeholders in order to study the equipment in operation.

Therefore, the HPMP demonstration projects will cover two important sectors in order to ensure a high level of replication of the projects. The demonstration projects should have significant potential environmental (ozone and climate) benefits as well as visible economic gains. The major criteria for selection of two participant organizations will be as follows:

- High demonstration value in terms of replication in other organizations or companies or sectors and in light of cost savings/economic benefits (energy efficiency);
- High demonstration value in terms of minimizing of environmental impacts (ozone and climate);
- High accessibility – demonstrations should be taken place in towns and/or in training institutions where people can get access to and actually visit the demonstration;

The projects need to demonstrate both short term alternatives that can be used in existing technologies but also in particular focus on low GWP alternatives that are currently not well established on the market and require a greater extent of technology transfer. For both short and long term alternatives it is important to ensure that training is seen as useful by the industry. This is also true for training in good practice and requirements of proper service equipment. By selecting representative systems for demonstration projects and ensure that proper technologies and work methods are required in these projects will also serve to create a market for those that involve themselves in the technology change. When the demonstration projects have been finalised, a second workshop will be arranged to present the results to other stakeholders.

Table 7-3: Cost for Demonstration Projects to use natural refrigerants

Description of activities	Budget in USD
<i>Demonstration Projects to use natural refrigerants</i>	
Equipment	78,000
Workshops (two)	5,000
Contingency 10%	8,300
<b>Sub-total</b>	<b>91,300</b>
<b>Total</b>	<b>91,300</b>

#### 7.4 Component 4: Technical assistance to support good servicing practices in the refrigeration sector

This component addresses the physical capacity requirements associated with the urgent and longer term need to upgrade the country's refrigeration servicing sector. It is envisioned to have two specific activities described below: support to upgrade the service equipment and improved infrastructure for re-use of refrigerants.

##### *Support to upgrade the service equipment*

Investment in necessary equipment to do proper service on refrigeration and AC equipment is necessary to achieve 15% and 35% reduction steps in the consumption of HCFCs. In order to promote the use of proper service equipment and utilisation of the national Code of Practice some support for the necessary equipment are included into the HPMP. The companies that upgrade their competencies to work according to the requirements as specified in the Code of Practice are able to request assistance to purchase part of the equipment needed. It should be made clear that the support will be given on a first-come, first-serve basis and only for a specified period. Some kind of distribution system for the limited MLF funding will be needed at the NOU/PMU and that system should be designed to handle requests from a number of companies.

The initial focus would be on ensuring that the majority of the country's qualified technicians are equipped with adequate recovery equipment along with supporting tools and leak detection equipment and trained. At present it is estimated that only approximately 15% of the technicians are adequately equipped and have some access to basic recycling capability and what capacity that exists is largely designed for CFCs.

The following standard servicing equipment will be considered:

- ✓ Vacuum pumps
- ✓ Manifolds, gauges and standard hoses (HCFC, HFC, and HC)
  
- ✓ Portable leak detectors
- ✓ Multi-meters and servicing tools
- ✓ Re-usable refrigerant charging cylinders
- ✓ Portable Recovery and Recycling Machines capable of handling HCFCs and HFCs

##### *Improved infrastructure for re-use of refrigerants*

The reuse of the existing HCFC stock will play a role in the phase-out of HCFCs in Georgia. The existence of a functioning re-use system will be essential to reduce the current reluctance of many service technicians to introduce new service practices including use of recovery equipment. Two recovery centres (in Tbilisi and in Kutaisi in West Georgia) have been established under the National Programme for Recovery & Recycling of Refrigerants in Georgia. The Recycling centres have been provided with recycling equipment and they have received a set of recovery equipment, cylinders and service tools. Moreover, the TPMP included support to improve the re-use system of refrigerants by upgrading the main recycling centre (in Tbilisi) to function as a reclaim centre that can validate the quality of processed material.

The re-use scheme is a pre-requisite for improved recovery rates and better practices. The following equipment is necessary for upgrading the reclaim centre in Tbilisi and recovery and recycling centre in Kutaisi.

Table 7-5: Cost for Technical assistance to support good servicing practices in the refrigeration sector

Description of equipment	USD
<i>Support to upgrade the service equipment</i>	
Vacuum pumps (20 units)	6,000
Manifolds, gauges and standard hoses (HCFC, HFC, and HC) (20 kits)	9,000
Portable leak detectors (20 units)	10,000
Multi-meters and servicing tools (20 units)	4,000
<b>Sub-total</b>	<b>29,000</b>
<i>Improved infrastructure for re-use of refrigerants</i>	
Refrigerant identifier (2 unit, latest model to allow also for use on blends)	8,000
Accessories to Gas Chromatograph SRI8610C	5,600
Drier Filter Tower for Van Steenburgh Reclaim system (6 units)	3,000
Portable refrigerant recovery machine (4 unit)	8,000
Reusable cylinder for recovered CFC (40 pieces)	4,800
Test pump for hydraulic test of cylinders max test pressure 350 bar (2 unit)	13,000
<b>Sub-total</b>	<b>42,400</b>
Contingency 10%	7,140
<b>Total</b>	<b>78,540</b>

### 7.5 Component 5: Technical assistance in the solvent sector

Georgia developed this component in order to phase out the entire use of HCFC142b consumption in its solvent sector in cost-effective manner. The main objective of the component is to demonstrate and expedite adoption of HCFC142b alternatives through targeted program for the equipment in the solvent sector.

There are two options for complete phase out of HCFC142b consumption in the solvent sector in Georgia. The first option provides opportunities for the complete replacement of equipment by the new which operates on alternative solvents. This is the most suitable approach taking into account the age of the equipment and the energy-effectiveness of old equipment which is extremely low. However, the large financing support is required for the realization of such replacement. According to the national consultants, the replacement of one unit would require about 35,000 USD. Therefore, the overall cost for the investment component only to replace 17 units of the equipment operating on HCFC142b would be about 595,000 USD.

The second option provides opportunities for retrofitting the equipment of cleaning companies from HCFC142b to the alternative solvents. If perchlorethylene or trichloroethylene are selected as alternative solvents, the retrofit requires the following steps:

1. Installation of the pump for the filling of machine of the required solvent.
2. Installation of a vacuum segment.
3. Installation of additional vaporizer for the contaminated solvent. Checking whether an additional condenser is needed, and installation;

4. Replacement of filter
5. Readjustment of the automatic control system requiring for the period of the cleaning process.
6. Installation of drum storage for waste materials and inventory monitoring

The total cost of the retrofit for one machine would be about 7,000 USD. The activities are considered as a technical assistance for end-users to eliminate the consumption of HCFC142b in a respective company. As already mentioned above, these measures of the phase out of HCFC142b consumption in the solvent sector is less suitable, however, on the basis of the much lower cost of this option, the required support for end-users is proposed under HPMP. It is also proposed for end-users as an alternative option to purchase cheaper new equipment running on alternatives of HCFC-142b. In all cases if costs exceed US\$ 7,000 per machine, companies will be responsible for covering additional expenses.

It is important at first to implement the pilot project since such activities in the solvents sector have been never carried out in Georgia. The impact of this project would include demonstration of ODS free alternatives so that they can be adopted in the market in a fast track manner. The detailed eligibility criteria for participation in the programme would be defined by the NOU with technical support from UNDP. In order to promote the programme in the solvent sector, promotional and technical literature and documentation will be prepared. It is essential to organize four technical assistance workshops covering all regions for end-users to familiarize them with the programme and promote their participation.

Once the programme is completed, Georgia will ban the import of HCFC142b into the country starting from 1 January of 2016. This measure would help Georgia complying obligations under the Montreal Protocol.

The tentative timing for the component is during the period July 2011 to December 2015. The activities under the project would be detailed out in a comprehensive project implementation plan and aligned with the national policy and regulatory framework for HPMP implementation.

International consultant will assist end-users to design retrofit through exchange experiences and information on the retrofit options. He/she will assist in organization of a technical workshop and provide technical presentation/report.

Table 7-6: Cost for Technical assistance in the solvent sector

Description of activities	Budget in USD
International consultant	7,000
National consultants	15,000
Four workshops (covering regions)	10,000
Incentive grants	119,000
Program promotion, documentation, technical literature	18,000
<b>Sub-total</b>	<b>169,000</b>
<i>Contingency 10%</i>	16,900
<b>Total</b>	<b>185,900</b>



## 7.6 Component 6: Project implementation, monitoring and evaluation

The objective of this component is to ensure that all planned activities are fully carried out according to the agreed timetable and are satisfactorily completed and followed-up. In Georgia, the HPMP will be implemented by the Ministry of Environment Protection and project implementation team composed of UNDP individual service contractors. This involves the following: participate in the implementation of components and activities funded by the MLF, formulation of guidelines and regulations as required for policy implementation, support to public awareness activities and, interaction with other ministries, stakeholders.

On a daily basis the HPMP will be managed by the Project Implementation Team operating under the Montreal Protocol Enabling Activities (EA) programme of UNDP. The EA programme of UNDP composes Montreal Protocol relating output projects (IS, TPMP, HPMP preparation). It should be highlighted that the TPMP and HPMP preparation output projects would be completed by the end of December of 2010. Since the HPMP will be implemented for the duration of 10 years, the Montreal Protocol EA Programme Manager will serve as a project manager (PM) of the HPMP on the part time basis overseeing the implementation by meeting the project's specific milestones. The Project Manager will be supported by HPMP project assistant also on a part time basis and national consultants in order to enable smooth and uninterrupted implementation of the project. A cost of part time project manager and assistant will be shared between HPMP and IS projects that are being renewed every biannum and implemented under the Montreal Protocol Enabling Activities (EA) programme of UNDP.

The Ministry of Environment Protection of Georgia as an implementing partner for the project will designate a National Project Director who "supports the program or project and serves as a focal point on the part of government. NPD's responsibility normally entails ensuring effective communications between the partners and monitoring of progress towards expected results" UNDP. The project Executive Board composed of the representatives of the NOU, the Ministry and UNDP as well as a National Project Director, Project Manager, National Ozone Focal Point and representative of the Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers will be established. This board will have a general oversight function, give guidance to the project and make key decisions for the project. It will meet at least once in a quarter.

In order to achieve the targets set out in the HPMP it is essential that monitoring of the implementation of the proposed measures is carried out. The expected monitoring activities will include the following: (1) effective monitoring and evaluation of all components of the HPMPs to be assured, (2) project activities will be kept on schedule, (3) progress towards objectives can be measured, and (4) project problems will be identified and remedied.

The project will undergo periodic audits by a certified auditor according to UNDP rules and regulations.

## 8. Cost and financing of the proposed measures

Table 8-1: Budget for the HPMP

<b>Policy, Regulatory and Institutional Support</b>	
National consultants for development of the legislative acts	8,000
Two national workshops	2,000
Contingency 10%	1,000
<b>Total</b>	<b>11,000</b>
<b>Training, Capacity-building and Awareness</b>	
<i>Updating a Code of Practice</i>	
National consultants	3,000
Targeted information material	2,000
Printing and distribution	1,600
Contingency 10%	660
<i>Sub-total</i>	<i>7,260</i>
<i>Training on good practices in the refrigeration sector</i>	
Arrangements of 15 workshops (including one for trainers)	15,000
Arrangements of training for assemblers of HCFC equipment (2 workshops)	3,000
Reproduction of documents	4,000
Contingency 10%	2,200
<i>Sub-total</i>	<i>24,200</i>
<i>Training of future technicians and further strengthening of vocational schools</i>	
Update and production of training materials	5,000
Equipment for 3 Training Centres (approx from 5,000 USD/school)	15,000
Internship for best students (3 students)	5,000
Contingency 10%	2,500
<i>Sub-total</i>	<i>27,500</i>
<i>Training of Customs officers to monitor HCFC import-export</i>	
Training program, 10 workshops	10,000
Update of software, training materials and information leaflet	3,000
Contingency 10%	1,300
<i>Sub-total</i>	<i>14,300</i>
<i>Strengthening the Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers</i>	
Establishment of comprehensive web-site	5,000
Organization of yearly conferences on technology innovations in the RAC sector (3 meetings)	9,000
Production of two leaflets about HCFC alternative technologies in Georgian language	4,000

Contingency HPMP milestones and time plan	1,800
Table 9-1 Time plan 10%	
<i>Sub-total</i>	19,800
<i>Targeted information</i>	
Awareness campaign will be covered by IS project	0
<i>Sub-total</i>	0
<b>Total</b>	<b>93,060</b>
<b>Demonstration projects</b>	
<i>Demonstration Projects to use natural refrigerants</i>	
Equipment	78,000
Workshops (two)	5,000
Contingency 10%	8,300
<i>Sub-total</i>	91,300
<b>Total</b>	<b>91,300</b>
<b>Technical assistance to support good servicing practices in the refrigeration sector</b>	
<i>Support to upgrade the service equipment</i>	
Basic tools	29,000
Contingency 10%	2,900
<i>Sub-total</i>	31,900
<i>Improved infrastructure for re-use of refrigerants</i>	
Basic equipment for R/R centers	42,400
Contingency 10%	4,240
<i>Sub-total</i>	46,640
<b>Total</b>	<b>78,540</b>
<b>Technical assistance in the solvent sector</b>	
International consultant	7,000
National consultants	15,000
Two workshops	10,000
Incentive grants	119,000
Program promotion, documentation, technical literature	18,000
Contingency 10%	16,900
<b>Total</b>	<b>185,900</b>
<b>Project implementation, monitoring and evaluation</b>	
Project coordination to ensure implementation of HPMP activities	37,364
Contingency 10%	3,736
<b>Total</b>	<b>41,100</b>
<b>GRAND TOTAL</b>	<b>500,900</b>

## II PROJECT RESULTS AND RESOURCES FRAMEWORK

<b>Intended Outcome as stated in the Country Programme Results and Resource Framework: Disaster Risk Reduction</b>					
<b>Outcome indicators as stated in the Country Programme Results and Resources Framework, including baseline and targets. 3.2.1 Enabling environment and status of implementation of national and international environmental commitments. Enabling environment established and national and international environmental commitments implemented.</b>					
<b>Partnership Strategy: Ministry of Environment Protection of Georgia; Georgian Association of Refrigerating, Cryogenic and Air-Conditioning Engineers; Georgian Refrigerant Recovery and Recycling Center; Department of the Customs Control ; Department of Statistics; Sector enterprises; Vocational Education Schools;</b>					
<b>Project title and ID (ATLAS Award ID): HCFC Phase –out Management Plan (HPMP) – stage 1</b>					
<b>Intended Outputs</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Target</b>	<b>Inputs</b>	<b>Risks and Assumptions</b>
Objective: Enable Georgia to meet the obligations under the Montreal Protocol and its' Amendments.	I. Georgia freezes HCFC22 consumption by 2013 and to meet 10% and 35% reduction targets in 2015 and 2020 according to the Montreal Protocol targets.  II. Consumption of HCFC142b in the solvent sector by 1 January of 2016 is totally phased out.	Country obligation to meet agreed targets for HCFC overall consumption and keep reduction and keep an allowance of 2.5% of the baseline consumption for meeting servicing needs till 2040.	Consumption of HCFC22 reduced and HCFC142b phased out by 2020 and 2016 respectively.	Total input: USD 500,900	Insufficient cooperation and commitment from concerned institutions.
Output 1: Policy, Regulatory and Institutional Support	1.1. Introduction of import quotas on HCFCs 1.2. Improvement of Certification System and Control of service methods	Current legislation which regulates ozone related issues throughout a number of regulatory acts	Improvement of certification system; Streamline legislation, which might include but not	USD 11,000 National consultants and	Delays in ratification within the concerned governmental institutions

	and equipment containing ODSs.	and licensing system to be updated.	limited to introduction of Import Quotas on HCFC22 and equipment containing HCFC22 to avoid boosting of HCFC demand. Environmental Code which is currently under preparation should include ODS related issues.	workshops.	
Output 2: Training, Capacity Building and Awareness	<p>2.1. Update code of practice.</p> <p>2.2. Trainings for technicians, customs officers; strengthening of vocational education schools;</p> <p>2.3. Implementation of the targeted awareness rising campaign.</p>	Existing code of practice needs update. Practitioner technicians' skill building is necessary to efficiently handle transition period. New generation of RAC engineers need training, officers at customs to be trained and informed. Lack of information among general public and specific target groups.	Existing Code of Practice updated. Series of trainings for technicians, engineers, customs officers conducted. Awareness rising among general population as well as inside targeted groups to improve the safety, efficiency and productivity refrigeration and air-conditioning systems carried out.	USD 93,060 Trainings, printed materials, national consultations.	Delays in ratification within the concerned governmental institutions. Little interest and reluctance in participation from beneficiaries side.
Output 3: Demonstration Project	3.1. Implementation of demonstration projects so that local practical experience is gained and end-users confidence is built up.	Lack of local experience and professional confidence among sector specialists.	Natural refrigerant technologies applied through demonstration projects in the RAC. Workshop with presentation of case studies organized.	USD 91,300 Equipment and workshops.	Delays may occur in purchase of equipment for the due to retardation of international bidding process.
Output 4: Technical Assistance to Support Good Servicing Practices in the Refrigeration	4.1. Service equipment upgrade and improvement of infrastructure for re-use of refrigerants.	Service equipment outdated.	Standard equipment procured. Two reclaim and recycle centers upgraded.	USD 78,540 Equipment	

Output 5: Technical Assistance in the Solvent Sector	5.1. Assistance in retrofitting equipment of the solvent-sector companies to the alternative solvents.	Phase-out in solvent sector not completed. Lack of experience and technical literature related to solvent sector.	Technical assessment of either retrofitting of existing equipment or replacement by new to be done, depending on resource availability. Technical workshops conducted, technical and promotional literature prepared.	USD 185,900 International and national consultations, workshops, technical literature, printed materials	Increase in prices may cause additional budgetary constraints.
Output 6: Project Implementation Monitoring and Evaluation	6.1. Continuous monitoring of implementation process so that compliance with the plans is ensured.	Continuous control and monitoring of planned activities, assurance of quality and timeliness of work.	All activities are accomplished as scheduled. Resources and time-schedule is maintained and quality of deliverables ensured.	USD 41,100 Project implementation related costs.	Resource limitation may impede and endanger quality of the overall process of project implementation.
<b>TOTAL BUDGET</b>				<b>US\$ 500,900</b>	

### III HPMP MILESTONES AND TIME-PLAN

Table 9.1 Time-Plan

Activities	2011				2012				2013				2014				2015			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Policy, Regulatory and Institutional Support</b>																				
Development of the legislative acts for application of the quota system																				
Improvements in the certification system																				
Control of service methods and equipment containing ODSS																				
Two national workshops																				
Development of supportive regulatory acts																				
<b>Training, Capacity-Building and Awareness</b>																				
Updating a Code of Practice (Evaluation, proposal and approval)																				
Training on good practices in the refrigeration sector (Training of trainers)																				
Training on good practices in the refrigeration sector (Training of technicians)																				
Training of future technicians and further strengthening of vocational																				

school																											
Training of Customs officers to monitor HCFC import-export																											
Strengthening the Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers																											
Targeted information																											
<b>Demonstration projects</b>																											
Demonstration Projects to use natural refrigerants																											
<b>Technical assistance in the solvent sector</b>																											
Development and production of training materials and information leaflet																											
Technical assistance to retrofit HCFC-based equipment to non-HCFC alternatives																											
Workshops and presentation of results																											
<b>Project implementation, monitoring and evaluation</b>																											
Monitoring, implementation and evaluation																											



Activities	2016				2017				2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Technical assistance to support good servicing practices in the refrigeration sector</b>																				
Support to upgrade the service equipment																				
Improved infrastructure for re-use of refrigerants																				
Targeted information																				
Targeted information																				
<b>Project implementation, monitoring and evaluation</b>																				
Project implementation, monitoring and evaluation																				

## IV MANAGEMENT ARRANGEMENTS

The Ministry of Environment Protection of Georgia is the responsible authority for the implementation of the Montreal Protocol in Georgia and it oversees the implementation of the ozone related activities in the country. The National Ozone Unit created under the Ministry coordinates and implements ODS phase-out policies and projects.

"HCFC Phase-Out Management Plan" project falls under the ongoing "Enabling Activities Program for Implementation of Montreal Protocol in Georgia (EAPIMP)". National Project Director (NPD) is designated by the Ministry who "supports the program or project and serves as a focal point on the part of government. NPD's responsibility normally entails ensuring effective communications between the partners and monitoring of progress towards expected results".

The Project Executive Board (PEB) will direct the project and will be the ultimate decision-maker for it. It will ensure that the project remains on course to deliver the desired outcomes of the required quality. The PEB will make management decisions for the project when guidance is required by the Project Manager or when project tolerances have been exceeded. More specifically, the PEB will set up tolerance levels for project stages in terms of duration and disbursement of financial resources. The PEB will review and clear Annual Work Plans (AWP) and annual progress achieved by the project through Annual Project Reviews based on the approved annual work plans.

PEB will review and approve project activity plans and will authorize major deviations from the agreed plans. The PEB is the authority that signs off on the completion of each stage plan as well as authorizes the start of the next stage plan. It will ensure that required resources are committed, will arbitrate any conflicts within the project or negotiate a solution to any problems between the project and external bodies. The PEB will meet on a quarterly basis (more often if required). Prior to the quarterly meetings, the Project Manager will duly submit the progress report on the previous period and the plan for the next one. The PEB will evaluate submitted documents and be in charge of approving plans and budgets.

The PEB will consist of the representatives of the NOU, Ministry of Environment Protection, UNDP and the representative of the Georgian Association of Refrigerating, Cryogenic and Air-Conditioning Engineers. The Ministry of Environment Protection, its National Project Director will assume the Executive Role in the Board.

Project Assurance – this is one of the key roles in the project management structure. The Project Assurance will act as an independent and objective quality monitoring agent, avoiding the potential "self-serving bias". In addition, the project assurance will verify the products' or outputs' quality. The Regional Technical Advisor for Chemicals at the UNDP Bratislava Regional Center, Georgia UNDP Energy and Environment Team Leader and Programme Associate will play the Project Assurance role.

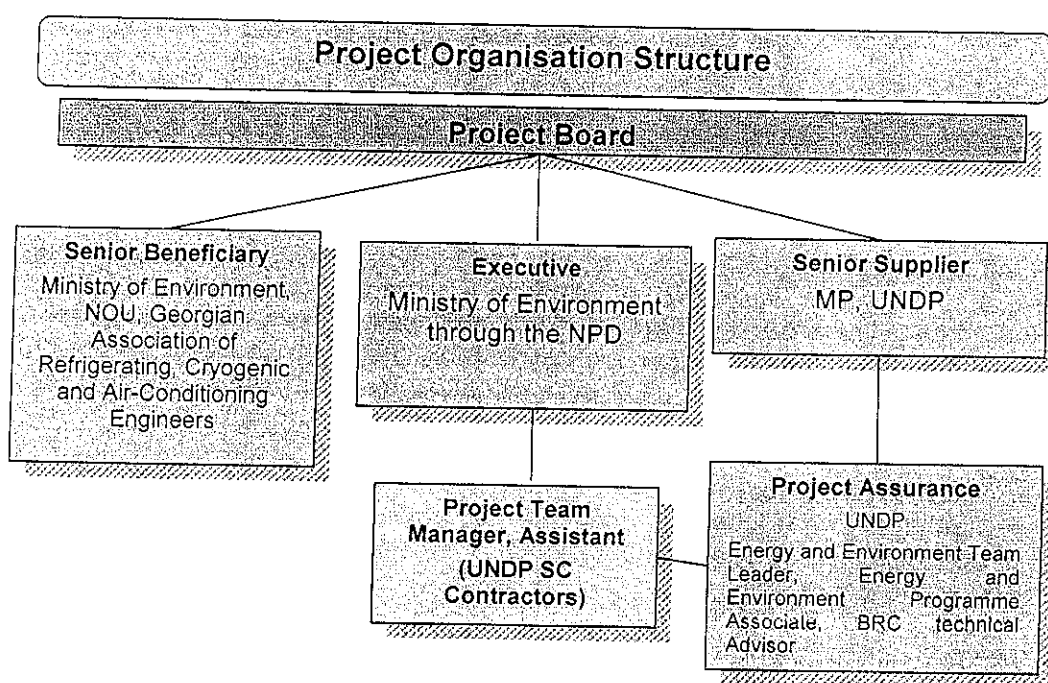
### Communications

The NPD and the PMU will communicate with a variety of audiences and be in charge of keeping the stakeholders informed of the progress overall and on the most important project events. Further, they will be responsible for building and sustaining the Ministry's commitment to the project and the involvement of project stakeholders. To do this, the Ministry of Environment Protection and the PMU will develop a communications strategy. They will maintain a high level of transparency and openness throughout the project implementation. The PMU and the Ministry will prepare promotional materials which will bear the logos of all project partners. The same standard will also apply for all other written materials and publications and will also apply to all public events.

### Financial and other procedures

Payments will be performed primarily through direct payments. A letter of agreement will be signed between the Ministry of Environment Protection and UNDP CO outlining the support services that UNDP will provide to the executing agency during the project implementation. The Project Manager will be authorized to sign payment requests to be made on the basis of the budget approved by PEB. Granting external access to ATLAS system to the project personnel will be part of the standard service agreement.

In accordance with standard UNDP procedures, all resources/equipment gained through project support remains the property of UNDP until project closure when a decision will be taken as to how to dispose of these resources. It is standard practice to leave resources with the implementing partner after project closure as a contribution to the development of national capacity.



## V MONITORING FRAMEWORK AND EVALUATION

In accordance with the programming policies and procedures outlined in the UNDP User Guide, the project will be monitored through the following:

Within the annual cycle

- On a quarterly basis, a quality assessment shall record progress towards the completion of key results, based on quality criteria and methods captured in the Quality Management table below.
- An Issue Log shall be activated in Atlas and updated by the Project Manager to facilitate tracking and resolution of potential problems or requests for change.
- Based on the initial risk analysis submitted (see annex I), a risk log shall be activated in Atlas and regularly updated by reviewing the external environment that may affect the project implementation.
- Based on the above information recorded in Atlas, a Project Progress Reports (PPR) shall be submitted by the Project Manager to the Project Board through Project Assurance, using the standard report format available in the Executive Snapshot.
- a project Lesson-learned log shall be activated and regularly updated to ensure on-going learning and adaptation within the organization, and to facilitate the preparation of the Lessons-learned Report at the end of the project
- a Monitoring Schedule Plan shall be activated in Atlas and updated to track key management actions/events

Annually

- **Annual Review Report.** An Annual Review Report shall be prepared by the Project Manager and shared with the Project Board and the Outcome Board. As minimum requirement, the Annual Review Report shall consist of the Atlas standard format for the QPR covering the whole year with updated information for each above element of the QPR as well as a summary of results achieved against pre-defined annual targets at the output level.
- **Annual Project Review.** Based on the above report, an annual project review shall be conducted during the fourth quarter of the year or soon after, to assess the performance of the project and appraise the Annual Work Plan (AWP) for the following year. In the last year, this review will be a final assessment. This review is driven by the Project Board and may involve other stakeholders as required. It shall focus on the extent to which progress is being made towards outputs, and that these remain aligned to appropriate outcomes.

**Quality Management for Project Activity Results**

*Replicate the table for each activity result of the AWP to provide information on monitoring actions based on quality criteria. To be completed during the process "Defining a Project" if the information is available. This table shall be further refined during the process "Initiating a Project".*

OUTPUT 1:		
<b>Activity I</b>	Policy Regulatory and Institutional Support	Start Date: End Date:
<b>Purpose</b>	Introduction of quotas for HCFC import and improvement of the Certification System and Control of Service methods and equipment containing ODS	
<b>Description</b>	Development of Environmental Code, update of the Presidential Decree on the Control of Ozone Depleting Substances in Georgia, introduction of service methods and prohibitions necessary for improved control of ODS consumption	
<b>Quality Criteria</b> <i>how/with what indicators the quality of the activity result will be measured?</i>	<b>Quality Method</b> Means of verification. What method will be used to determine if quality criteria has been met?	<b>Date of Assessment</b> When will the assessment of quality be performed?

Introduction of import quotas for HCFC22.	Appropriate legal acts introduced	
Certification of technicians and companies, clarification of certification requirements	Applicable manual with rules and procedures available;	
Introduction of measures for service methods' control	Regular leak test introduced, system of recoding maintained.	
<b>Activity 2</b>		
	Training Capacity-building and Awareness	Start Date: End Date:
<b>Purpose</b>	Updating of Georgian Code of Practice for the refrigeration service sector. Improvement of specialists capacities.	
<b>Description</b>	Identification of gaps and improvement of the Code of Practice. Organization of skill-building trainings and best-practice sharing workshops for specialists of concerned fields.	
<b>Quality Criteria</b> <i>how/with what indicators the quality of the activity result will be measured?</i>	<b>Quality Method</b> Means of verification. What method will be used to determine if quality criteria has been met?	<b>Date of Assessment</b> When will the assessment of quality be performed?
Updated version of the code of practice is available and in force.	Updated version of the code of practice is available and in force.	
Trainings for refrigeration sector specialists	Enhanced methods are used by sector practitioners	
Trainings for future technicians and support to the Vocational Schools	Increased number of trained students and sector practitioners	
Training for Customs officers	Customs officers' capacity improved and recommended methods are regularly used	
Information sharing activities carried out	As a result of targeted awareness raising actions coordination is improved in different concerned sectors	
<b>Activity 3</b>		
	Demonstration Projects	Start Date: End Date:
<b>Purpose</b>	Building-up practical experience and confidence of end-users at local level. Creation of case studies that will contain lessons learned and good practices.	
<b>Description</b>	Implementation of the demonstration projects will result in improved practical skills within the sector practitioners, scaled up professional and end-user confidence among local beneficiaries. Accumulated experience will be reflected in case studies with documented methods that will serve as a guide document for sector practitioners.	
<b>Quality Criteria</b> <i>how/with what indicators the quality of the activity result will be measured?</i>	<b>Quality Method</b> Means of verification. What method will be used to determine if quality criteria has been met?	<b>Date of Assessment</b> When will the assessment of quality be performed?
Criteria and methods for implementation of demonstration projects identified and information	Study visits and technical workshops conducted	

distributed		
Demonstration projects show both, short and long-term alternatives that can be used in existing technologies	Trainings and technical workshops conducted	
<b>Activity 4</b>	Technical Assistance to support good servicing practices in the refrigeration sector	Start Date: End Date:
<b>Purpose</b>	Focus on physical capacity requirements to upgrade the country's refrigeration servicing sector	
<b>Description</b>	Result achieved through upgrading the service equipment and improved infrastructure for re-use of refrigerants.	
<b>Quality Criteria</b> <i>how/with what indicators the quality of the activity result will be measured?</i>	<b>Quality Method</b> Means of verification. What method will be used to determine if quality criteria has been met?	<b>Date of Assessment</b> When will the assessment of quality be performed?
Recommended equipment for candidate companies defined, purchased and training provided	Companies receive appropriate support and start practical utilization of provided equipment	
Recycling centres upgraded	Equipment procured	
<b>Activity 5</b>	Technical Assistance to the Solvent Sector	Start Date: End Date:
<b>Purpose</b>	Demonstrate and expedite adoption of HCFC142b alternatives through targeted program for the equipment in the solvent sector.	
<b>Description</b>	There are two options for complete phase out of HCFC142b consumption in the solvent sector in Georgia. The first option provides opportunities for the complete replacement of equipment by the new which operates on alternative solvents and the second option provides opportunities for retrofitting the equipment of cleaning companies from HCFC142b to the alternative solvents.	
<b>Quality Criteria</b> <i>how/with what indicators the quality of the activity result will be measured?</i>	<b>Quality Method</b> Means of verification. What method will be used to determine if quality criteria has been met?	<b>Date of Assessment</b> When will the assessment of quality be performed?
Procurement and installation of equipment	Solvent sector companies equipped and operational	
Elaboration and publication of technical and promotional material	Material available and distributed	
Organization of trainings and technical assistance workshops for end-users	Workshops conducted covering all regions of the country	
<b>Activity 6</b>	Project Implementation, monitoring and evaluation	
<b>Purpose</b>	Ensure that all planned activities are fully carried out according to the agreed timetable and are satisfactorily completed and followed-up	
<b>Description</b>	Day-to-day implementation of the project is carried out in full accordance with the agreed and approved plan. Activities are coordinated and the quality of performance is	

	ensured.	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method	Date of Assessment When will the assessment of quality be performed?
All components of the HPMPs are monitored and carried out in accordance with the applicable UNDP rules and procedures	Activities are implemented smoothly without delays and technical complications. Appropriate level of communication is ensured	
Project activities are carried out as planned	Project progress achieved as per the agreed plan	
Project problems identified and remedied.	Appropriate coordination and communication is ensured	

## VI LEGAL CONTEXT

If the country has signed the Standard Basic Assistance Agreement (SBAA), the following standard text must be quoted:

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

The implementing partner shall:

- a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- b) assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document".

## RISK LOG

(see *Deliverable Description* for the Risk Log regarding its purpose and use)

Project Title: HCFC Phase-out Management Plan (HPMP) – stage 1	Award ID:	Date: January 18, 2012
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#	Description	Date Identified	Type	Impact & Probability	Countermeasure s / Mngt response	Owner	Submitted, updated by	Last Update	Status
1	Insufficient cooperation and commitment from concerned institutions.	January 2012	Political	Overall delay in planned activities, additional efforts for increasing efficiency might appear necessary P = 3 I = 3	What actions have been taken/will be taken to counter this risk  Planned information sharing and awareness raising activities will be used to address this risk	Project Coordinator	Nestan Khuntsaria	January 2012	no change
2	Delays in ratification within the concerned governmental institutions	January 2012	Regulatory	Delays in acceptance and endorsement of suggested amendments to the existing legislative documents, adoption of recommendations and their reinforcement.  P = 3 I = 3		Project Coordinator	Nestan Khuntsaria	January 2012	no change
3	Little interest and reluctance	January 2012	Strategic	Due to lack of sufficient information among	Planned information sharing	Project Coordinator	Nestan Khuntsaria	January 2012	no change



	in participation from beneficiaries side.				target segments, experience and professional confidence in and participation in and effectiveness of planned activities might be less than expected. P = 3 I = 3	and awareness rising activities will be used to address this risk				
4	Delays may occur in purchase of equipment for the due to retardation of international bidding process	January 2012	Operational		Extended process of procurement might cause delays especially with international procurement equipment. P = 3 I = 3		Project Coordinator	Nestan Khuntsaria	January 2012	no change
5	Resource limitation may impede and encanger quality of the overall process of project implementation.	January 2012	Operational		Limited budget for project management and oversight cost may have negative impact on acquiring high quality service. P = 3 I = 4		Project Coordinator	Nestan Khuntsaria	January 2012	no change
6	Increase in prices may cause additional budgetary constraints.	January 2012			Planned procurement covers long period of time P=1 I=3		Project Coordinator	Nestan Khuntsaria	January 2012	no change



**AGREEMENT BETWEEN THE GOVERNMENT OF GEORGIA AND THE  
EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN  
CONSUMPTION OF HYDROCHLOROFLUOROCARBONS**

1. This Agreement represents the understanding of the Government of Georgia (the "Country") and the Executive Committee with respect to the reduction of controlled use of the ozone-depleting substances (ODS) set out in Appendix 1-A ("The Substances") to a sustained level of 3.00 ODP tonnes prior to 1 January 2020 in compliance with Montreal Protocol schedules, with the understanding that this figure is to be revised one single time in 2011, when the baseline consumption for compliance would be established based on Article 7 data, with the funding to be adjusted accordingly, as per decision 60/44.
2. The Country agrees to meet the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A ("The Targets, and Funding") in this Agreement as well as in the Montreal Protocol reduction schedule for all Substances mentioned in Appendix 1-A. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in paragraph 3, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to any consumption of the Substances which exceeds the level defined in row 1.2 of Appendix 2-A ("maximum allowable total consumption of Annex C, Group I Substances"; the Target) as the final reduction step under this Agreement for all of the Substances specified in Appendix 1-A, and in respect to any consumption of each of the Substances which exceeds the level defined in rows 4.1.3 and 4.2.3 (remaining eligible consumption).
3. Subject to compliance by the Country with its obligations set out in this Agreement, the Executive Committee agrees in principle to provide the funding set out in row 3.1 of Appendix 2-A ("Targets and Funding") to the Country. The Executive Committee will, in principle, provide this funding at the Executive Committee meetings specified in Appendix 3-A ("Funding Approval Schedule").
4. The Country will accept independent verification, to be commissioned by the relevant bilateral or implementing agency, of achievement of the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A ("The Targets, and Funding") of this Agreement as described in subparagraph 5(b) of this Agreement.
5. The Executive Committee will not provide the Funding in accordance with the Funding Approval Schedule unless the Country satisfies the following conditions at least 60 days prior to the applicable Executive Committee meeting set out in the Funding Approval Schedule:

- a) (That the Country has met the Targets for all relevant years. Relevant years are all years since the year in which the hydrochlorofluorocarbons phase-out management plan (HPMP) was approved. Exempt are years for which no obligation for reporting of country programme data exists at the date of the Executive Committee Meeting at which the funding request is being presented;
- b) That the meeting of these Targets has been independently verified, except if the Executive Committee decided that such verification would not be required; UNEP/OzL.Pro/ExCom/63/30
- c) That the Country had submitted tranche implementation reports in the form of Appendix 4-A ("Format of Tranche Implementation Reports and Plans") covering each previous calendar year, that it had achieved a significant level of implementation of activities initiated with previously approved tranches, and that the rate of disbursement of funding available from the previously approved tranche was more than 20 per cent; and
- d) That the Country has submitted and received approval from the Executive Committee for a tranche implementation plan in the form of Appendix 4-A ("Format of Tranche Implementation Reports and Plans") covering each calendar year until and including the year for which the funding schedule foresees the submission of the next tranche or, in case of the final tranche, until completion of all activities foreseen.

6. The Country will ensure that it conducts accurate monitoring of its activities under this Agreement. The institutions set out in Appendix 5-A ("Monitoring Institutions and Roles") will monitor and report on implementation of the activities in the previous tranche implementation plan in accordance with their roles and responsibilities set out in Appendix 5-A. This monitoring will also be subject to independent verification as described in sub-paragraph 5(b).

7. The Executive Committee agrees that the Country may have the flexibility to reallocate the approved funds, or part of the funds, according to the evolving circumstances to achieve the smoothest phase-down and phase-out of the Substances specified in Appendix 1-A. Reallocations categorized as major changes must be documented in advance in a Tranche Implementation Plan and approved by the Executive Committee as described in sub-paragraph 5(d). Major changes would relate to reallocations affecting in total 30 per cent or more of the funding of the last approved tranche, issues potentially concerning the rules and policies of the Multilateral Fund, or changes which would modify any clause of this Agreement. Reallocations not categorized as major changes may be incorporated in the approved Tranche Implementation Plan, under implementation at the time, and reported to the Executive Committee in the Tranche Implementation Report. Any remaining funds will be returned to the Multilateral Fund upon closure of the last tranche of the plan.

8. Specific attention will be paid to the execution of the activities in the refrigeration servicing sub-sector, in particular:

- a) The Country would use the flexibility available under this Agreement to address specific needs that might arise during project implementation; and
- b) The Country and the bilateral and implementing agencies involved will take full account of the requirements of decisions 41/100 and 49/6 during the implementation of the plan.

9. The Country agrees to assume overall responsibility for the management and implementation of this Agreement and of all activities undertaken by it or on its behalf to fulfil the obligations under this Agreement. UNDP has agreed to be the lead implementing agency (the

"Lead IA") in respect of the Country's activities under this Agreement. The Country agrees to evaluations, which might be carried out under the monitoring and evaluation work programmes of the Multilateral Fund or under the evaluation programme of any of the agencies taking part in this Agreement.

10. The Lead IA will be responsible for carrying out the activities of the plan as detailed in the first submission of the HPMP with the changes approved as part of the subsequent tranche submissions, including but not limited to independent verification as per sub-paragraph 5(b). The Executive Committee agrees, in principle, to provide the Lead IA with the fees set out in row 2.2 of Appendix 2-A. UNEP/OzL.Pro/ExCom/63/30

11. Should the Country, for any reason, not meet the Targets for the elimination of the Substances set out in row 1.2 of Appendix 2-A or otherwise does not comply with this Agreement, then the Country agrees that it will not be entitled to the Funding in accordance with the Funding Approval Schedule. At the discretion of the Executive Committee, funding will be reinstated according to a revised Funding Approval Schedule determined by the Executive Committee after the Country has demonstrated that it has satisfied all of its obligations that were due to be met prior to receipt of the next tranche of funding under the Funding Approval Schedule. The Country acknowledges that the Executive Committee may reduce the amount of the Funding by the amounts set out in Appendix 7-A in respect of each ODP tonne of reductions in consumption not achieved in any one year. The Executive Committee will discuss each specific case in which the Country did not comply with this Agreement, and take related decisions. Once these decisions are taken, this specific case will not be an impediment for future tranches as per paragraph 5.

12. The Funding of this Agreement will not be modified on the basis of any future Executive Committee decision that may affect the funding of any other consumption sector projects or any other related activities in the Country.

13. The Country will comply with any reasonable request of the Executive Committee and the Lead IA to facilitate implementation of this Agreement. In particular, it will provide the Lead IA with access to information necessary to verify compliance with this Agreement.

14. The completion of the HPMP and the associated Agreement will take place at the end of the year following the last year for which a maximum allowable total consumption has been specified in Appendix 2-A. Should at that time activities be still outstanding which were foreseen in the Plan and its subsequent revisions as per sub-paragraph 5(d) and paragraph 7, the completion will be delayed until the end of the year following the implementation of the remaining activities. The reporting requirements as per Appendix 4-A (a), (b), (d) and (e) continue until the time of the completion if not specified by the

Executive Committee otherwise.

15. All of the agreements set out in this Agreement are undertaken solely within the context of the Montreal Protocol and as specified in this Agreement. All terms used in this Agreement have the meaning ascribed to them in the Montreal Protocol unless otherwise defined herein.

## APPENDICES

### APPENDIX 1-A: THE SUBSTANCES

Substance	Annex	Group	Starting point for aggregate reductions in consumption (ODP tonnes)
HCFC-22	C	I	4.61
HCFC-142b	C	I	0.72

### APPENDIX 2-A: THE TARGETS, AND FUNDING

		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	n/a	n/a	5.33	5.33	4.79	4.79	4.79	4.79	4.79	3.46	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	n/a	n/a	5.33	5.33	4.79	4.14	4.14	4.14	4.14	3.00	n/a
2.1	Lead UNDP agreed funding (US \$)	200,000			150,000			119,400			31,500	500,900
2.2	Support costs for Lead IA (US \$)	15,000			11,250			8,955			2,363	37,568
3.1	Total agreed funding (US \$)	200,000	0	0	150,000	0	0	119,400	0	0	31,500	500,900
3.2	Total support cost (US \$)	15,000	0	0	11,250	0	0	8,955	0	0	2,363	37,568
3.3	Total agreed	215,000	0	0	161,250	0	0	128,355	0	0	33,863	538,468

	costs (US \$)										
4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes)										1.61
4.1.2	Phase-out of HCFC-22 to be achieved through previously approved projects (ODP tonnes)										0
4.1.3	Remaining eligible consumption of HCFC-22 (ODP tonnes)										3.00
4.2.1	Total phase-out of HCFC-142b agreed to be achieved under this agreement (ODP tonnes)										0.72
4.2.2	Phase-out of HCFC-142b to be achieved in previously approved projects (ODP tonnes)										0
4.2.3	Remaining eligible consumption for HCFC-142b (ODP tonnes)										0

#### APPENDIX 3-A: FUNDING APPROVAL SCHEDULE

1. Funding for the future tranches will be considered for approval not earlier than the first meeting of the year specified in Appendix 2-A.

#### APPENDIX 4-A: FORMAT OF TRANCHE IMPLEMENTATION REPORTS AND PLANS

1. The submission of the Tranche Implementation Report and Plan will consist of five parts:

(a) A narrative report regarding the progress in the previous tranche, reflecting on the situation of the Country in regard to phase out of the Substances, how the different activities contribute to it and how they relate to each other. The report should further highlight successes, experiences and challenges related to the different activities included in the Plan, reflecting on changes in the circumstances in the Country, and providing other relevant information. The report should also include information about and justification for any changes vis-à-vis the previously submitted tranche plan, such as delays, uses of the flexibility for reallocation of funds during implementation of a tranche, as provided for in paragraph 7 of this Agreement, or other changes. The narrative report will cover all relevant years specified in sub-paragraph 5(a) of the Agreement and can in addition also include information about activities in the current year;

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(b) A verification report of the HPMP results and the consumption of the Substances mentioned in Appendix 1-A, as per sub-paragraph 5(b) of the Agreement. If not decided otherwise by the Executive Committee, such a verification has to be provided together with each tranche request and will have to provide verification of the consumption for all relevant years as specified in sub-paragraph 5(a) of the Agreement for which a verification report has not yet been acknowledged by the Committee;

(c) A written description of the activities to be undertaken in the next tranche, highlighting their interdependence, and taking into account experiences made and progress achieved in the implementation of earlier tranches. The description should also include a reference to the overall Plan and progress achieved, as well as any possible changes to the overall plan foreseen. The description should cover the years specified in sub-paragraph 5(d) of the Agreement. The description should also specify and explain any revisions to the overall plan which were found to be necessary;

(d) A set of quantitative information for the report and plan, submitted into a database. As per the relevant decisions of the Executive Committee in respect to the format required, the data should be submitted online. This quantitative information, to be submitted by calendar year with each tranche request, will be amending the narratives and description for the report (see sub-paragraph 1(a) above) and the plan (see sub-paragraph 1(c) above), and will cover the same time periods and activities; it will also capture the quantitative information regarding any necessary revisions of the overall plan as per sub-paragraph 1(c) above. While the quantitative information is required only for previous and future years, the format will include the option to submit in addition information regarding the current year if desired by the Country and the Lead IA; and

(e) An Executive Summary of about five paragraphs, summarizing the information of above sub-paragraphs 1(a) to 1(d).

#### APPENDIX 5-A: MONITORING INSTITUTIONS AND ROLES

1. In Georgia, the HPMP will be implemented by the Ministry of Environment Protection and

Natural Resources and project implementation team composed of UNDP individual service contractors.

2. The Ministry of Environment Protection and Natural Resources of Georgia as an implementing partner for the project will designate a National Project Director (NPD) who will support the programme or project and will serve as a focal point on the part of the Government. NPD's responsibility normally entails ensuring effective communications between the partners and monitoring of progress towards expected results. The project Executive Board composed of the representatives of the National Ozone Unit (NOU), the Ministry and UNDP as well as a NPD, Project Manager, National Ozone Focal representative of the Georgian Association of Refrigerating, Cryogenic and Air-conditioning Engineers will be established. This Executive Board will have a general oversight function, give guidance to the project and make key decisions for the project. It will meet at least once every three months. 3. The Ministry of Environment Protection and Natural Resources will also ensure the involvement of other related Government stakeholders such as the Customs department to assist with the implementation of specific HPMP components.

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4. In order to achieve the targets set out in the HPMP it is essential that monitoring of the implementation of the proposed measures is carried out. The expected monitoring activities will include the following:

- (a) Effective monitoring and evaluation of all components of the HPMP;
- (b) Measuring progress; and
- (c) Identifying project problems.

The NOU will be responsible for the overall monitoring of HPMP programme.

5. The project will undergo periodic audits by a certified auditor according to UNDP rules and regulations.

#### **APPENDIX 6-A: ROLE OF THE LEAD IMPLEMENTING AGENCY**

1. The Lead IA will be responsible for a range of activities. These can be specified in the project document further, but include at least the following:
- (a) Ensuring performance and financial verification in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country's phase-out plan;
  - (b) Assisting the Country in preparation of the Tranche Implementation Plans and subsequent reports as per Appendix 4-A;
  - (c) Providing verification to the Executive Committee that the Targets have been met and associated annual activities have been completed as indicated in the Tranche Implementation Plan consistent with Appendix 4-A;
  - (d) Ensuring that the experiences and progress is reflected in updates of the overall Plan and in future Tranche Implementation Plans consistent with sub-paragraphs 1(c) and 1(d) of Appendix 4-A;
  - (e) Fulfilling the reporting requirements for the tranches and the overall Plan as specified in Appendix 4-A as well as project completion reports for submission to the Executive Committee;
  - (f) Ensuring that appropriate independent technical experts carry out the technical reviews;
  - (g) Carrying out required supervision missions;
  - (h) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Tranche Implementation Plan and accurate data reporting;
  - (i) In case of reductions in funding for failure to comply in accordance with paragraph 11 of the Agreement, to determine, in consultation with the Country, the allocation of the reductions to the different budget items and to the funding of each implementing or

bilateral agency involved;  
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(j) Ensuring that disbursements made to the Country are based on the use of the indicators;  
and

(k) Providing assistance with policy, management and technical support when required.

2. After consultation with the Country and taking into account any views expressed, the Lead IA will select and mandate an independent organization to carry out the verification of the HPMP results and

the consumption of the Substances mentioned in Appendix 1-A, as per sub-paragraph 5(b) of the Agreement and sub-paragraph 1(b) of Appendix 4-A.

#### **APPENDIX 7-A: REDUCTIONS IN FUNDING FOR FAILURE TO COMPLY**

1. In accordance with paragraph 11 of the Agreement, the amount of funding provided may be reduced by US \$180 per ODP kg of consumption beyond the level defined in row 1.2 of Appendix 2-A

for each year in which the target specified in row 1.2 of Appendix 2-A has not been met.