MID-TERM EVALUATION

ODS Waste Management and Disposal
Project BRA/14/G72

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SUMMARY

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LIST OF ACRONYMS AND ABBREVIATIONS

ABC	Brazilian Cooperation Agency
ABNT	Brazilian Association of Technical Standards
AMT	Mid-Term Evaluation
CAP	Project Monitoring Committee
CETESB	Environment Sanitation Company of the State of São Paulo
CFC	Chlorofluorocarbon
CFQ	Federal Chemistry Council
CONAMA	National Environment Council
CRA	Regeneration and Storage Center
CRQ	Regional Chemistry Council
CTF/APP	Federal Technical Registry of Potentially Polluting Activities and/or Users of Environmental Resources
DEX	Direct Execution
ExCom	FML Executive Committee
FML	Multilateral Fund for the Implementation of the Montreal Protocol
GEE	Greenhouse Gas
GGR	Results Management Guide
GIZ	German Agency for International Cooperation
HC	Hydrocarbon
HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
IAT	High Temperature Incineration
IBAMA	Brazilian Institute of Environment and Renewable Natural Resources
IPCC	Intergovernmental Panel on Climate Change
MCTIC	Ministry of Science, Technology, Innovation and Communications
MI	Expression of Interest
MMA	Ministry of Environment
MOP	Meeting of the Parties to the Montreal Protocol
MTE	Mid-Term Evaluation
ODS	Ozone Depleting Substances
NA	Unavailable
PAG	Global Warming Potential
PBCO	Brazilian Program for the Elimination of the Production and Consumption of Substances that Deplete the Ozone Layer
PDO	Ozone-Depleting Potential
PBH	Brazilian HCFC Phase-Out Program
PNC	National Plan for CFC Elimination

PNRS	National Policy on Solid Waste
PNUD	United Nations Development Program
PNUMA	United Nations Environment Program
PROZON	Inter-Ministerial Executive Committee for the Protection of the Ozone Layer
PU	Polyurethane Foam
RAC	Refrigeration and Air Conditioning
SDO	Sustainable Development Objective
SENAI	National Service of Industrial Learning
SIGAP	Project Management Information System
TEAP	Technology and Economic Assessment Panel
UDR	Decentralized Recycling Units
UIM	Implementation and Monitoring Unit
UNDP	United Nations Development Program

Executive Summary

Table: Project Summary

Project Title: BRA/14/G72 – Demonstration Project for ODS Waste Management and Disposal

Project:			*At endorsement (US$)*	*At completion (US$)*
UNDP Project ID:	00084741	MPU- Donor	1,490,600.00	1,490,600.00
Country:	Brazil	IA/EA own:	0	0
Region:	RBLAC	Government:		
Focal Area:	CC	Outro:	0	0
FA Objectives, (OP/SP):	EA	Co-Financing Total:		
Executing Agency:	UNDP	Project Total Cost:	1,490,600.00	1,490,600.00
Other Partners Involved:	MMA Coordinator of activities related to the implementation of the Montreal Protocol	PRODOC Signature (data project began): June 8, 2015 (Operational) Closing Date: Proposed: 2017 Actual: June 2015		

Box 1

The Demonstration Project "ODS Waste Management and Disposal" was designed with four components, namely:

Component 1 (C.1): Establish an Integrated ODS Waste Management System, including technical assistance for collection, training, storage, consolidation and transportation;

Component 2 (C.2): Carry out tests for ODS waste incineration from qualification of selected incineration plants, following national legislation and appropriate protocols, complemented by international standards, including logistical analysis and the costs involved;

Component 3 (C.3): Technical assistance associated with the evaluation and standardization of procedures and criteria for the management and environmentally adequate Disposal of ODS waste;

Component 4 (C.4): Project Management associated with the implementation, supervision, monitoring and evaluation of planned activities.

Project implementation started at the end of 2015 with preparation activities and the Mid-Term Evaluation seeks to analyze the activities and results contained in **Components C.1 and C.2.**

The Project Document was structured to produce results that control the stock of residues of Ozone Depleting Substances (ODS), in the country and lead to the disposal of these substances, contributing to total elimination of chlorofluorocarbon (CFC) and other substances and protection of the ozone layer. The Mid-Term Evaluation (MTE) has the objective of analyzing the results of Components 1 and 2 of Project BRA/14/G72 and its outputs and outcomes. These partial results are presented in the box below.

Box 2

Outcome 1: Integrated ODS Waste Management System, including technical assistance for collection, training, storage, consolidation and transportation.

Output 1.1.: Extended ODS waste storage structure.

Activities developed to achieve the indicative activities described in the PRODOC and implementation status

2016

- Preparation of the Terms of Reference and definition of the logistical system:
  a) Formulation of a Call for Expression of Interest (MI) for the selection of Regeneration and Storage Centers (CRAs) that participate in Project BRA/14/G72 implementation and which have increased their storage capacity and the suitability of their laboratory equipment: Activity performed and result obtained.
  b) Publication of a Call for Expression of Interest (MI) for CRAs: activity performed and result obtained.
  c) Preparation of a study to verify the requirements for application of the AHRI 700 standard by CRAs (verification of requirements, form of implementation and costs associated with processes): activity performed and result obtained.
  d) Consultation of the CRQ/CFQ on the technical responsibility of the CRAs laboratories for ODSs chemical analysis (technical report issuance): activity performed and result obtained.
  e) Updating the ODS stored inventory for final destination (CRAs and UDRs). Confirmation of quantity/weight: activity performed and result obtained.
  f) Payment of Temporary Storage services: Payment of Temporary Storage (Retroactive) of ODSs in Bandeirantes and Capital companies: activity performed.
  g) Analyze the expressions of interest received in the ambit of MI 32016/2016: activity carried out.
  h) Disclose results of MI 32016/2016 for qualification of selected CRAs - Recigases, CRN, Frigelar, Ecosuporte: activity performed.

- Equipment acquisition
  a) Verification of the appropriate cylinder type and quantity for the CRAs in relation to the storage, transportation and final destination process: activity performed and result obtained.
  b) Consultation with national and international suppliers with verification of brands, capacities and budget aiming at the acquisition of materials and equipment for handling ODSs and laboratories (cylinders, identifiers, chromatographs, equipment and laboratory materials) and definition of technical criteria: activity performed and result obtained.
  c) Publication of call (by lot) to acquire equipment for CRAs: activity performed and result obtained.

2017

- Formulation of the Terms of Reference and strengthening of the Integrated ODS Management System:
  a) Temporary storage payments done: Payment of Temporary Storage (retroactive) of Bandeirantes and Capital: activity carried out.
  b) Develop analysis of the Call for Expression of Interest (MI) received in the MI 32017/2016: activity carried out.
  c) Disclose results of MI 32017/2016 for qualification of CRAs: selected CRAs - Recigases, CRN, Frigelar, Ecosuporte: activity carried out.
  d) Hire a Temporary Storage service in four (4) CRAs: CRN, Frigelar, Ecosuporte and Recigases: activity in execution.
  e) Carry out mapping of environmental agencies to involve them as part of waste management: activity in planning.

- Equipment acquisition
  a) Increase capacity and adaptation in the laboratory by means of the activities: i) to formulate and approve budget to laboratory equipment and materials; ii) TOR preparation with technical specification for the bidding process; iii) Development of the purchasing process: opening of RC for the laboratory material purchase; iv) TOR publication; v) Technical evaluation of proposals; vi) Approval and completion of the purchase process: part of the activity carried out and part in progress.
  b) Accompany equipment installation, calibration, tests etc.: activity in progress.
  c) Perform training for the use of laboratory equipment and materials: activity in planning.

- To increase capacity of the selected CRAs:
  a) Prepare TOR with technical specifications for bidding: activity performed.
  b) Carry out the purchase process: i) prepare and publish TOR; ii) technical evaluation of proposals; iii) approval and finalization of the purchase process. Waiting for delivery of the cylinders in the CRAs: activity in progress.

Output 1.2: Technical material for ODS waste management produced.

Activities developed to achieve the indicative activities described in the PRODOC and implementation status

2016

- Formulation of the TOR and Production and Revision of the Technical Material.
  a) Preparation of teaching materials for the Training Plan (including inventory management, collection, handling, identification, storage and final destination) and including presentation, training notebook and booklet for the consumer (with technical, administrative, legal and practical information and regulations): Part formulated and another in preparation.
- Disseminate and make available on digital media for free access by the interested public:
  a) To elaborate content on the project for availability in the page of the Protocol of Montreal in Brazil (http://www.protocolodemontreal.org.br/site/pbh/projeto-generation- and-destination-final-of-sdos/sobre-O-project): activity performed, result obtained.

2017

- Dissemination of information and training
  a) Elaborate new folder of the project: activity in planning.
  b) Elaborate training material - handout, power point presentation after the qualification of the incinerators: activity in planning.
  c) Elaborate handbook on Waste Management of ODSs: activity in planning.
  d) To prepare an invitation to institutions and bodies for training: activity in planning.
  e) Perform training: activity in planning.
- Training/Materials /Waste Managers, CRAs and UDRs
  a) Conduct research of interest with waste managers on the training: activity performed.
  b) Elaborate training material (handout, power point elaboration): activity in planning.
  c) Elaborate invitation to companies for training event: activity in planning.
  d) Perform training: activities in planning.
- Updating of Sector Regulations
  a) Prepare Technical Standard on the classification of gaseous wastes: activity in planning.
- Disclosure of information
  a) Develop a campaign to encourage the adequate management of ODS; Materials, folder to the end of the chain; Involvement of maintenance companies/consumers; Information - Magazines/Newspapers/TV: activity in planning with an elaborate and publicized folder.
  b) Continuously update the Project Site BRA/14/G72: activity in progress.

Output 1.3: Technical training event for ODS waste management carried out

Activities developed to achieve the indicative activities described in the PRODOC and implementation status

2016

- Dissemination of information and training
  a) To participate in training related to the project: "Procedures for the management of refrigerants", focusing on the protection of the ozone layer for technicians and refrigerators, including description of basic training content, definition of training unit - SESI/SENAI: activity carried out.
  b) Workshop (UDRs and CRAs): material on responsible use of refrigerant gases from collection, regeneration or recycling, safe storage, Disposal and combating illicit trade, including recording the workshop, taking advantage of information and scenes, as data for the construction of the Integrated ODS Waste Management System and as information and images for the Marketing Plan: activity in phase of the conclusion planning.
  c) Disseminate information on CRAs and UDRs and public awareness of environmental issues, which impact the entire chain. Strengthening of the work and role of the Centrals in receiving, regenerating, recycling and Disposal of waste gases (all units) Information available on the Montreal Protocol website in Brazil (http://www.protocolodemontreal.org.br/site/Pbh/project-management-and-destination-final-of-ODS/over-project). Activity performed, result obtained.

2017

- Dissemination of information and training
  a) Prepare Workshops (DRUs and CRAs): material on the responsible use of refrigerant gases from collection, regeneration or recycling, safe storage, Disposal and combating illicit trade, including recording the workshop, taking advantage of information and

scenarios, as data for the construction of the Integrated System of Waste Management of ODS: in the phase of conclusion of the planning.

Output 1.4: Technical Assistance for the operation of the Integrated ODS Waste Management System.

Activities developed to achieve the indicative activities described in the PRODOC and implementation status

2017

- Consolidation of the Integrated ODS Waste Management System.
  a) Delivery of 1,000-pound and 100-pound cylinders, equipment and operational tools for CRAs (Capacity Enhancement) - ITB Procurement Process JOF 0042-30621/2017: activity in progress.
  b) Bid for purchase of equipment, materials and laboratory reagents for CRAs - Procurement Process JOF-0230-31098/2017: activity in progress.
  c) Contract with CRAs for ODS Temporary Storage - Release of partial appeal by quarter, through approved report: activity in progress.
  d) Contractual Instrument for equipment donation for the CRAs (operation and laboratory) - MoU or Term of Transfer of assets: activity in progress.
  e) Delivery Laboratory equipment, materials and reagents for CRAs - Procurement Process JOF-0230-31098/2017: activity in progress.
  f) Installation and Training - Laboratories CRAs: activity in planning.
  g) Contract with CRAs to ODS transfer to standard cylinders and cleaning of old tanks and cylinders: activity in progress.
  h) Training and training event for CRAs, UDRs, waste managers and environmental agencies (after the licensed incinerator and approved standards): activity in planning.

Outcome 2: ODS residue incineration demonstrated.

Output 2.1: ODS waste incineration carried out.

Activities developed to achieve the indicative activities described in the PRODOC and implementation status

2017

- Qualification of Incinerators
  a) Formulate Expression of Interest (MI) for incinerator selection: activity carried out.
  b) Publish Notice of MI 30431/2017 to select the incinerators: activity performed.
  c) Analyze the expressions received in the context of MI 30431/2017: activity carried out.
  d) Disclose the result of MI 30431/2017: activity carried out.
- Incinerator suitability
  a) Hold technical meetings to define the scope of the adhesions, definition of work schedule: activity carried out.
  b) Define mechanisms of transfer of resources to implement the adjustments in the incinerator: activity performed.
  c) Perform Service Contract procedures: i) Preparation of invitation letter - CC; ii) Send letter of invitation (request UCC); iii) Forecast response to CC; iv) Preparation and submission to the CAP; v) Contract preparation (request UCC); vi) Signature: activity in progress.
  d) Follow installation and testing in the incinerator: activity in planning.

e) Follow procedures for licensing the installation of incinerator adequacies: activity in planning.

- Burn Test
  a) Carry out a price quotation in the laboratory to perform sampling and analysis: verify parameters with the incinerator; Hire laboratory for sampling and analysis; Check which contracting instrument will be used and who will be responsible: activity in progress.
  b) Schedule burning test with the parties involved (incinerators, laboratory and environmental agency): activity in planning.
  c) Define sample and preparation of the shipment to the incinerator (or incinerators): check with the sample CRAs for the tests: activity in the planning stage.
  d) Perform burning test: activity in planning.
  e) Obtain report with result of the burning test: activity in planning.
  f) Follow procedure for licensing the incinerator operation: activity in planning.
  g) Send waste of ODS to the incinerator: activity in planning.
  h) Guide the CRAs on the request for environmental authorization (CADRI). Activity in planning.
  i) Define the logistics for transportation of the ODS from the CRAs to the incinerator: activity in planning.
  j) Contract the incineration of ODSs and to follow the effective destruction of the ODSs passive through Certificate of the Waste Destruction: activity in planning.

Rating for Project Design and Outcome Implementation

Evaluation Ratings:			
1. Monitoring and Evaluation	**Rating**	**2. IA& EA Execution**	**Rating**
M&E design at entry	5 (S)	Quality of UNDP Implementation	6 (HS)
M&E Implementation Plan	5 (S)	Quality of Execution – Executing Agency	6 (HS)
Overall quality of M&E	5 (S)	Overall quality of Implementation/ Execution	6 (HS)
3. Assessment of Outcomes	**Rating**	**4. Sustainability**	**Rating**
Relevance	2 (R)	Financial resources	4 (L)
Effectiveness	5 (S)	Socio-political	4 (L)
Efficiency	5 (S)	Institutional framework and governance:	4 (L)
Overall Project Outcome Rating	5 (S)	Environmental	4 (L)
		Overall likelihood of sustainability:	4 (L)

[1] *Evaluation Office, 2012, United Nations Development Programme, p. 29.*

[1] According to *"Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects"*:
Highly Satisfactory = 6 (HS); Satisfactory = 5 (S), Highly Unsatisfactory = 1 (HI)
Sustainability = 4 Probable, Moderately Likely (low risk) = 3, Substantial Risk = 1
M & A - General Quality of M&A = 6, M&A Design = 6, M&A Implementation Plan = 6
Quality of Implementation = 6 points, Quality of Execution = 6, Overall Quality = 6

According to the Evaluator, the Project rating as a whole is Satisfactory (5 points), which means that the Project has some small shortcomings and delays in implementation, although they are recoverable and are justified by the delay in establishing the execution team and the complexity of the actions leading to Project results.

Implementation Considerations, Conclusions and Recommendations

According to the Evaluator, the implementation of Demonstration Project for ODS Waste Management and Disposal has been satisfactory. The factors that will lead to success of the Project's results and dissemination of good practices in the future include the development of activities considered by the MTE to be fundamental for achievement of the Project's final objective, namely incineration of ODS waste currently identified in the country and inventoried by the Project.

These activities include those that led to the selection of ODS Regeneration and Storage Centers (CRAs) to become partners in Project implementation, other research initiatives and contacts established to select the company capable of performing ODS waste incineration, with evaluation of its equipment and material for transportation of waste to the incinerator as well as the search for and selection of specialists, institutional arrangements and planning and programming of training programs about sector issues.

All these actions taken as preparatory to the Project outputs and achievement of the final result, namely incineration of ODS and other substances were considered by the MTE as key points for the success in Project implementation. These partial results are due to the composition of both the execution team and the Project coordination unit. In addition, the involvement of experts contracted by the Project and especially its work to evaluate the CRA laboratories for efficient analysis of ODS residues and alternative substances have been key to the search for efficient results. The results of these evaluations were important inputs for the decision to purchase equipment and materials to provide adequate laboratory environments for the selected companies. In this way, the activities that are explained in this MTE document are essential for reaching results and outputs of the Project components.

The tasks involving partnerships established with UNDP/MMA to build solid foundations for ODS waste storage, transportation and consolidation and the tasks of research and ODS destruction have required work by the execution team including site visits, meetings, evaluations and contacts with specialists to develop means to ensure that the Project achieves its purpose of final destination of ODS.

According to the MTE, all these complex tasks involving partnerships with diverse capabilities have required and will require increased control work, since the data collected will need to be more precise in order to guide incineration activities and ODS management and establish norms to be reformulated or defined by the control agencies. Thus, data collection will become increasingly complex, requiring more time and personnel to control and coordinate with databases and with the information that should

Relevance = (R) or (NR) (score 2 points); Efficacy = 6 points; Effectiveness = 6 points; Financial Resources = 4 points; Socio-politic = 4; Environment = 4 (4 being the highest score).

be controlled by IBAMA's Federal Technical Registry of Potentially Polluting Activities and/or Users of Environmental Resources (CTF/APP).

Regarding the actions for partner institution selection, the Regeneration and Storage Centers complied with the requirements set forth in the Call for Expressions of Interest (MI) and are committed to storage of the ODS currently identified in the country, carrying out activities that guarantee the proper custody and storage of the substances, handling various types of laboratory equipment provided within the scope of the Project. Identification of insufficient technical knowledge among those who work with these fluids as regards both handling these substances and appropriate procedures requires additional attention from the Project's training programs and wide dissemination of information.

Regarding the analysis of the Project activities executed and now under way, the MTE verified that the actions for selection of the partners for Project implementation required efficient and time-consuming work by the execution team. This is because many of the CRAs surveyed no longer had the equipment donated by the National Plan for CFC Elimination or else their equipment was already obsolete. The same is true for the contacts established with the Decentralized Recycling Units (UDRs).

Thus, in sum, the selected CRAs are located mainly in the states of São Paulo, Rio de Janeiro, Pernambuco and Rio Grande do Sul. Their work will undoubtedly open the market for management of ODS as well as refrigerant fluids. The companies are:

- **Recigases,** a company responsible for the regeneration of refrigerants in the state of Rio de Janeiro;
- **Frigelar**, company located in several cities and states around the country;
- **Centro de Regeneração e Reciclagem do Nordeste (CRN)**, headquartered in Recife, state of Pernambuco; and
- **MP2 Gerenciamento e Comércio de Resíduos - EcoSuporte Soluções em Gestão Ambiental,** in the city of Porto Alegre, state of Rio Grande do Sul.

These partners established for Project implementation are receiving some equipment, mainly for laboratory adequacy and others for ODS waste storage, such as cylinders suitable for this purpose. In addition, the development of these activities involves the transfer of knowledge that will be part of training programs and will contribute to development of a "Brazilian Model of ODS Waste Management and Final Destination", as is the intention of the UNDP/MMA team.

The selection of the company capable of carrying out ODS waste incineration was done by sending out the call for Expressions of Interest and receiving responses. The responses were carefully analyzed so as to select an institution that could create national capacity for the destruction of ODS residues and halogenated substances that no longer have commercial value and are unfit for use. The substances to be incinerated are basically CFCs (Chlorofluorocarbons), HCFCs and other ozone-depleting substances or alternatives with high potential for global warming (HFCs, for example).

The Expression of Interest foresaw appropriate heat treatment facilities for destruction that in fact correspond to the stage of establishment of an ODS Waste Management

System, as foreseen in Project BRA/14/G72 as a Outcome of Component 1. This appropriateness involves:

a) adaptation of a line for processing of gaseous substances in the company's furnace and all necessary equipment and materials;
b) tests of burning the substances and all costs involved in the burning operation;
c) environmental licensing; and
d) ODS incineration, in accordance with procedures and standards established by the Montreal Protocol.

The MTE verified that an Evaluation Committee of the Expression of Interest No. 30431/2017 was created and composed by the Project team and UNDP representatives of the administrative sector. The company selected met the eligibility criteria approved in Decision 60/44 of the Executive Committee of the Multilateral Fund (ExCom), in accordance with Article 5 of the Montreal Protocol. Some documents were also required for analysis and approval of the selected company and criteria for selection were defined and applied.

The enterprise selected, Essencis Soluções Ambientais, presented the required documentation, which included a license for thermal treatment activity, according to requirements for environmental licensing and other laws and regulations, such as:

1. CONAMA 316/2002 - Procedures and criteria for the operation of waste heat treatment system;
2. NBR 11175/1990 - Incineration of hazardous solid waste - Performance standards.

In addition, the Essencis company had a good technical evaluation, operating the heat treatment according to environmental licensing requirements and according to general criteria established and explained in the conclusion document about the selection process. Additional inquiries and procedures were responded to and met by the selected company.

Thus, as described in the completion report of this selection, after analyzing the information required to prove technical qualification, although it did not comply with some items that did not prevent it from being considered fit to act with Project BRA/14/G72, the Essencis company was selected to be a partner and receive the investments foreseen within the scope of this Project.

The Essencis Soluções Ambientais company has been established in the market since 2001 in the city of São Paulo, state of São Paulo, serving the entire country. It is committed to the guidelines of the National Solid Waste Policy (PNRS), making innovative technologies available to the industry. This company has a complete technology park for integrated solutions for the treatment of solid and liquid waste, and also has a laboratory equipped for analysis, monitoring and control of internal services and analysis of characteristics and classification of waste and effluents.

The MTE verified that a mission carried out by the UNDP/MMA Team collected further information about the company regarding the process of burning substances in a rotary kiln for solids and liquids, with a post-combustion chamber and an incinerator with

licensed capacity of 800 kg/hour. According to the visit report consulted, the Company's facilities visited also include:

- atmospheric emission control equipment, with a post-combustion chamber that results in the gases oxidation;
- a Quencher, equipment for cooling gases to control dioxins and furans;
- two Cyclones for particulate abatement and bag filter;
- a Venturi washer for gas cleaning and pH correction, an Absorption Tower and a Gas Analyzer.

The Project's technical team also observed the feeding system for solids and liquids as well as parameters and limits of furnace feed and atmospheric emissions. It was also certified that all of these items comply with CONAMA norm No. 316 and NBR 11175, according to the operating license.

All this care taken by the UNDP/MMA team is justified, since burning ODS and alternative substances cause emissions that need to be systematically controlled. Precaution involved a range of procedures that took significant time, but they lead to effective, efficient and sustainable results.

As is also explained in this MTE report, the contacts and the partnership established in an official letter of April 25, 2017, with the Environmental Sanitation Company of the State of São Paulo (CETESB) to support execution of activities of Project BRA/14/G72, are undoubtedly fundamental to the search for results with efficiency and effectiveness.

Thus, according to a mission report of the CETESB visit in April of 2017, a meeting on the need for adjustments in the incinerator of Essencis Soluções Ambientais also addressed issues of monitoring of atmospheric emissions and environmental licensing. This control must be carried out by CETESB, which has rules and procedures that are even stricter than those of the federal government and will accompany the incinerator burning tests.

At this meeting, according to the aforementioned visit report, after informing the Chlorine and Fluor feed limits of the incineration company's license, CETESB stated: *"We do not see any problem with substances or time for feeding, and if necessary, the feed rate can also be increased, as long as burning efficiency can be proved in the specific burning test."*

Also, in relation to ODS handling and storage, which is only authorized for solid waste, CETESB also stated explicitly in the aforementioned visit report: *"Essencis is not authorized to burn aerosols because they cause accidents when put into the furnace under pressure. But there is no problem for the company to handle and work with refrigeration fluid cylinders as long as professional staff is trained and fit for this activity."*

Regarding the necessary adaptations to be carried out at Essencis Soluções Ambientais, CETESB made clear that it would provide follow-up assistance for improvement and licensing, offering support from its staff, in addition to offering its facilities for use in training programs.

It is important to emphasize that, according to the Evaluator, all these contacts are highly relevant for the analysis of the ODS burning procedures, the final objective and central result of Project BRA/14/G72. According to research data and information collected during the MTE, there is no incinerator that does not release some kind of pollutant into the atmosphere.

As already shown in this MTE report, the activities carried out by the Project have improved data and provided more depth, generating more precise knowledge in the area of ODS final destination to obtain more consistent actions and methodologies to help reduce uncertainties in the application of burning processes and in obtaining accurate data to be incorporated into the CTF/APP/IBAMA/MMA, as well as managing residues of substances that cause harm to the ozone layer.

As has been done so far, encouraging prevention, reuse and recycling may reduce the need for ODS Disposal, but it must be noted that there are still 100 tons of ODS waste to be incinerated. The ODS waste that is stockpiled to be incinerated requires care that the Project implementation team is taking, as well as sufficient time.

According to MTE results, the delays that occurred in the Project execution schedule and the low level of physical-financial performance have justifications found in the explanation of implementation provided here about activities that require additional time in order for Project results to be reached.

Some recommendations that can be made by MTE are as follows:

- Extend the expiration date of the project for five (5) years in accordance with the proposed work schedule presented and approved by the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol at its 79th Meeting, held in July of 2017, in order to allow the activities in the execution and planning stages, including the effective destruction of the 100 tons of identified ODS residues, to be carried out;

- Support the CRAs to improve their laboratories. This improvement is necessary so that laboratories can adequately verify the degree of purity of fluids that have undergone regeneration processes. This is the only way for laboratories to certify regenerated fluids;

- Include in the training programs to be carried out within the scope of the Project emphasis on adequate handling, in terms of storage, transfer, transport and destruction of ODS;

- Review procedures and standards to include issues about data and information on ODS Waste Management, under development and to be developed in synergy with national programs on energy efficiency and sustainable management of solid waste and electrical and electronic equipment waste, as determined by the Project Document;

- Conduct, in a participatory manner, the revision of existing national technical standards and others to be created in accordance with international parameters that require viewing and revision simultaneously with the preparatory activities already

explained in this document. Industrial and professional associations and related institutions play an important role in this regard;

- Encourage discussions on specific issues raised during the execution of the activities of Project BRA/14/G72, based on workshops or meetings with the support of industrial associations and environmental agencies; and

- Carry out awareness-raising and training activities when possible. Although diffusion of technology occurs relatively quickly, changes in awareness and behavior of technicians in their work routines may take years.

1 Introduction

The Montreal Protocol on Ozone Depleting Substances (ODS), established in 1987, constitutes an environmental agreement ratified by 197 countries. It aims to protect the ozone layer by eliminating ODS production and consumption.

Brazil has been active in protecting and recovering the ozone layer for more than two decades. The country acceded to the Vienna Convention and the Montreal Protocol by means of Decree No. 99.280, of June 6, 1990, pledging to completely eliminate chlorofluorocarbons (CFCs), among other measures.

The National Plan for Elimination of CFCs (PNC) was presented by the Brazilian Government in July 2002 to the Executive Committee of the Montreal Protocol (ExCom). This plan aimed to implement strategies to eliminate CFC consumption in the country and it reached the goal of total elimination of chlorofluorocarbons by 2010. The actions carried out by the PNC were based on training and technical assistance, implementation of new technologies, changes in legislation and industrial processes aiming to reduce and eliminate the use and stocks of gases that are environmentally aggressive.

The PNC prioritized the banning of ODS focusing on two actions: a) continue to implement industrial conversion projects and b) managing CFC residues through installation of Regeneration and Storage Centers (CRA), training of refrigerator technicians and distribution of equipment for collecting CFCs for regeneration. The Plan also foresaw activities in the sectors of automotive and industrial air conditioning, aiming at gas collection and recycling in the course of periodic maintenance and repair.

To carry out PNC's actions, Brazil received resources from the Multilateral Fund for Implementation of the Montreal Protocol (MLF). The MLF was created in 1990, becoming a financial mechanism for technical and financial assistance to the Montreal Protocol Countries Parties, Article 5. Brazil, as one of the countries included in this article, has received financial assistance from the FML.

As FML provides financial assistance to developing countries through multilateral and bilateral agencies and government institutions, the United Nations Development Program in Brazil (UNDP/Brazil) has acted as one of the implementing agencies for the projects supported by the Fund and the Ministry of Environment (MMA) has acted as coordinating body.

The MMA, as an ozone unit under the Montreal Protocol and in conjunction with the Inter-Ministerial Executive Committee for the Protection of the Ozone Layer (PROZON), has promoted policies and guidelines, guiding and coordinating actions in Brazil related to the protection of the ozone layer. The Committee was created through Decree of March 2003 and is composed of the Ministries of Environment; Agriculture, Livestock and Supply; Foreign Affairs; Development, Industry and Foreign Trade; Finance; Science, Technology, Innovation and Communications; and Health.

The Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), linked to the MMA, is responsible for controlling ODS production, import, export and consumption in Brazil. Among its attributions, IBAMA establishes import quotas for controlled substances, issues import and export licenses and is responsible for controlling

the Federal Technical Registry of Potentially Polluting Activities and / or Users of Environmental Resources (CTF/APP), for ODS trade monitoring and for their use, as well as the prevention and control of illegal trade in ODS.

The Demonstration Project for ODS Waste Management and Disposal, BRA/14/G72, object of the present Mid-Term Evaluation (MTE), was approved at the 72nd Meeting of the MLF Executive Committee, which took place in May of 2014, involving financial resources of US$1,490,600 for implementation of the activities proposed in the project document.

The Project for ODS was designed with four components, namely:

Component 1 (C.1): Establish an Integrated ODS Waste Management System, including technical assistance for collection, training, storage, consolidation and transportation;

Component 2 (C.2): Carry out tests for ODS waste incineration based on qualification of selected incineration plants, subject to national legislation and relevant protocols, complemented by an international standard, including logistical analysis and the costs involved;

Component 3 (C.3): Technical assistance regarding the evaluation and standardization of procedures and criteria for environmentally adequate management and Disposal of ODS waste;

Component 4 (C.4): Project management associated with the implementation, supervision, monitoring and evaluation of planned activities.

Project implementation started at the end of 2015 with its preparations and the purpose of the Mid-Term Evaluation is to analyze the activities and results of Components C.1 and C.2.

1.1 Purpose of the Mid-Term Evaluation

The purpose of this Mid-Term Evaluation is to analyze Project BRA/14/G72 implementation and results in the period from June 8, 2015, to the present date, corresponding to the first phase of execution of results 1and 2.

Thus, the purpose is, through analysis of the results achieved, to extract lessons learned that can improve the sustainability of actions and strengthen the management and monitoring of this and other related projects. It also aims to identify potential planning problems, evaluate progress toward achievement of objectives and recommend specific actions that can improve Project performance, identifying signs of success or failure, and indicating the necessary adjustments.

In addition, the Project seeks to be compatible and in accordance with the Sustainable Development Objectives (SDOs) defined by the United Nations, specifically the following:

Objective 9: Industry, Innovation and Infrastructure

- Dissemination of technologies for environmentally adequate final destination of ODS and HFC waste; and
- Improved infrastructure for ODS and HCFC handling, storage, transport, identification and treatment.

Objective 12: Responsible Consumption and Production

- Awareness and dissemination of information on the importance of the non-use of substances harmful to the ozone layer and the global climate system; and
- Implementation of environmentally adequate actions to treat and dispose of ODS and HFC waste.

Objective 13: Action against Global Climate Change

- Implementation of a pilot system for adequate treatment of ODS and HFC waste

1.2 Scope & Methodology

1.2.1 Project Scope

By identifying and analyzing documentation of Project BRA/14/G72 activities, the Mid-Term Evaluation should also promote findings and recommendations and suggest improved development of activities related to the scope of the Project, such as contributions to the continuity of implementation of activities and results proposed in the Project Document (PRODOC).

In addition to the purposes indicated above, the purpose of the Mid-Term Evaluation is to present to the public and private institutions in the scope of the Project all the evidence and recommendations that emerge from the analysis of documents and procedures recommended and adopted, visits to the institutions involved in Project implementation, interviews with experts and those responsible for Project BRA/14/G72 actions and results.

1.2.2 Mid-Term Evaluation Methodology

Carrying out this Mid-Term Evaluation was made possible through selection of the consultant by UNDP/MMA, based on pre-established terms of reference. The attributions and qualifications of this consultant are defined in the Terms of Reference in Annex 1. The MTE methodology involves a Work Plan based on the inputs described in the Terms of Reference, included in Annex 2.

During the evaluation period, data were collected through interviews, meetings, visits to institutions, analysis of relevant technical and administrative-financial documents provided by the Project teams and information on execution procedures. The data collected allowed for response to questions and obtaining trustworthy answers.

The main Project actors and the implementation team of both the implementing agency (UNDP) and the coordinating agency (MMA) were interviewed and their names can be found in Annex 3.

Analysis of the mission and progress reports and other project implementation documents for Project BRA/14/G72, as well as some technical documentation pertinent to the subject, provided the basis and inputs for the analysis and preparation of this Mid-Term Evaluation report.

As for ethical aspects, informants are not mentioned by name in the present report.

1.3 Structure of the Mid-Term Evaluation Report

1.3.1 Report Structure

The structure of the Mid-Term Evaluation Report follows guidelines, standards and procedures established by UNDP and contained in the *"Handbook on Planning, Monitoring and Evaluating for Development Results".* The structure contains:

- Executive Summary;
- Introduction with an evaluation process overview and brief description of the project document, the problems the project seeks to achieve, the objectives to be achieved, the established indicators, the main stakeholders and the partial results achieved;
- Findings that emerged from partial implementation of the Project; and
- Recommendations.

1.3.2 Criteria for Evaluation and Key Issues to be Analyzed

The report uses the five evaluation criteria set out in the document and contained in the "*Handbook on Planning, Monitoring and Evaluating for Development Results"*, namely: relevance, effectiveness, efficiency, impact and sustainability.

The key issue that permeates the MTE report is to address the proposition: how to respond and make every effort to understand and act to promote the protection of the ozone layer since its destruction results in significant socioeconomic and environmental vulnerabilities? These concerns are part of Brazil's commitments as a signatory to the Montreal Protocol and its responsibilities set out in the National Solid Waste Policy (PNRS), which in Article 9 establishes priorities for waste management: "non-generation, reduction, reuse, recycling, solid waste treatment and environmentally sound disposal of wastes."

The project provides important contributions to the United Nations Sustainable Development Goals and to mitigating emissions, reducing vulnerabilities and reducing impacts due to global climate change.

The project has sought to comply with and follow national and international standards and norms for ODS management and Disposal that involve collection, transportation, shipment, treatment and Disposal of solid and tailings waste, as per the criteria of relevance, effectiveness, efficiency, sustainability and impact of Project actions:

- **Relevance:** This criterion is assessed in relation to responsibility for storing contaminated fluids to be destroyed and lack of awareness and consciousness about the importance of adequate storage and destruction of ODS. Above all, the Project is relevant because it seeks to demonstrate that the destruction of ODS waste in an environmentally adequate manner is feasible. The relevance also arises from the Project's purpose in establishing an Integrated ODS Management System.

- **Effectiveness and Efficiency:** This criterion applies to the scope of expected partial results and respective outputs relevant for actions of Project as a whole, in relation to its ultimate purpose, i.e. installation, operation and diffusion of results for ODS Disposal. These outputs will be monitored with the effective implementation of the ODS Waste Management System. In addition, capacity-building through specific training programs will also contribute to the ultimate goal, expanding Project effectiveness and efficiency. Thus, its results should have a demonstration effect for other initiatives.

- **Efficiency:** Did the Project and its activities lead to the disbursement of financial resources and actions of human resources with minimal waste, in order to achieve the outcomes and partial outputs in the context of the whole project? Has the Project been implemented efficiently?

- **Sustainability:** Has the Project provided financial, institutional and governance conditions for continuity during and after the implementation period? Do socioeconomic and environmental trends point to the continuity of the implementation actions foreseen in the Montreal Protocol, according to the commitments made by the Country, namely, to reduce GHG emissions that affect the ozone layer? Do conditions exist or are they foreseen so that the benefits and general results of the Project can be sustained and replicable?

- **Impact:** Has the Project promoted conditions for the knowledge of possible impacts in the national and global atmospheric environment if there is not adequate handling and management of the ODS waste disposal? Has the information and dissemination been adequate in relation to partial implementation of Project actions?

2 Project Description and Development Context

This item presents an explanation about the situations that constituted the basis for Project formulation with the approach regarding problems for the definition of components, activities and outputs aiming at the achievement of the proposed objectives.

2.1 Project Start and Duration

According to the BRA/14/G72 Project Document, the Project was approved in 2014 and commenced its activities in 2015, with an expected completion date of 2017. In July 2017, ExCom was requested to extend the project term for five (5) years, a request accepted by that Committee at its 79th Meeting. In addition, the Project Substantive Review document to be submitted to the Brazilian Cooperation Agency (ABC) and the Ministry of the Environment is being drafted to be agreed upon at the Tripartite Meeting, for the new term of Project execution.

2.2 Problems that the Project Sought to Address

The context and approach to the problems that underlies this Project require going back to data interpretation and analysis regarding plans, programs and projects developed or under development that seek or sought the elimination of substances that deplete the ozone layer. Thus, this Project is linked to the National Plan for CFC Elimination (PNC) projects, the Brazilian HCFC Phase-Out Program (PBH) and other plans or programs aimed at the elimination of ODS.

The PNC aimed to phase-out the remaining consumption of 9,276 tons of ODS in Annex A, CFCs Group I, during the period 2002-2010. To achieve this goal, a series of projects with investments, technical assistance and capacity-building activities were carried out with refrigeration and air conditioning companies that became partners in the implementation of projects. Due to the complex and dynamic nature of small and medium-sized enterprises (PMEs), some strategies or approaches proposed for the disposal of CFCs in different sectors have evolved over time. Such flexibility has been important in ensuring compliance with the Montreal Protocol elimination target. The Multilateral Fund for the Implementation of the Montreal Protocol has played an important role in financing PNC projects.

However, CFC phase-out initiatives required their replacement by HCFCs, which have also proved to be ozone depleting substances despite having lower potential for ozone depletion (ODP). Thus, the PBH strategy is to define and establish guidelines and actions aimed at replacing HCFCs, in accordance with the goals established in Decision XIX/6 to promote alternatives to HCFCs.

The implementation objectives of the ODS Waste Management and Disposal Demonstration Project address problems resulting from efforts and initiatives to eliminate the consumption of ozone depleting substances that attack the ozone layer and have become national and global environmental liabilities. These initiatives, as can be seen from their analysis, were contained in the PNC purposes and results, the PBH projects and other initiatives with the same purpose. They revealed the existence of ODS residues which remain as refrigerating fluid in RAC equipment or as a blowing agent in polyurethane foam. These substances may be released into the atmosphere at some point

in the life of refrigeration equipment or of products containing polyurethane foams if they are not properly treated.

The Montreal Protocol Parties have identified the problems that arise in developing countries, where there are still significant quantities of ODS with high ozone-depleting potential (ODP), mainly CFCs. The Parties therefore turned their attention to addressing issues of the ODS waste management and disposal and requested technical and financial support from the Multilateral Fund (ExCom) in accordance with the Montreal Protocol, Decision MOP XX/7 of the Manual for Demonstration Projects for ODS Waste Management and Disposal in Article 5 countries, and also requested the Technology and Economic Assessment Panel (TEAP) to update its procedures for environmentally appropriate ODS waste disposal found in the TEAP Task Force Report on Destruction Technology (Volume 3b, 2002) in order to be adopted by the Parties, as stated in the Project Document.

In line with the guidelines for financing demonstration projects for the environmentally appropriate management and final ODS waste disposal established in the ExCom Decision 58/19, Project BRA/14/G72 was approved at the 72nd ExCom meeting in May of 2014.

The Project approval with its activities considered the current ODS inventory, with data contained in a table in the PRODOC and updated by the Project team in March of 2016 (See Tables 1 and 2).

The PRODOC presents in Table 1 the ODS inventory in Brazil on February 28, 2014, which shows the baseline indicators. This table shows the amount of ODS residue in the inventory, that is, 796,176 kg of ODS (CFC-11 and CFC-12 that is contaminated and uncontaminated and to be identified). The table also explains the companies, their profile and the respective locations where the ODSs are stored. Additional numbers may be included through inventories made during Project execution.

Table 1: ODS Inventory in Brazil, February 28, 2014

Item	Company	Profile	City	State	ODS	Kg
1	Capital Refrigeração	Regeneration Center	Porto Alegre	RS	CFC-11 CFC Contaminated	11.250 4.900
2	Bandeirantes Refrigeração	Regeneration Center	São Paulo	SP	CFC-12 Contaminated	4.419
3	Bom Clima Refrigeração	Regeneration Center	Recife	PE	CFC-11 CFC-12 Contaminated	1.190 1.057
4	Revert Brasil	Dismantling and Recycling of Refrigerators	Careaçu	MG	CFC-11 Contaminated CFC-12 Contaminated	5.000 4.000
5	Frigelar	Regeneration Center	São Paulo	SP	CFC-12 Contaminated	300
6	Tecnitest	Final user	Rio de Janeiro	RJ	CFC-12 Contaminated	120
7	Refrigação Marechal	Gathering Company	São Paulo	SP	CFC-11	11.500

8	Carrier do Brasil	Final User	Canoas	RS	CFC-12 Contaminated	11.500
9	ClimaSul	Recycling Center	Curitiba	PR	CFC-12 Contaminated	500
10	Recigases	Recycling Center	Rio de Janeiro	RJ	CFC-12 Contaminated	13.540
11	IBAMA	Controlling Entity	São Paulo	SP	To be identified*	734.400
TOTAL						**796.176**

* *ODS from load seized by IBAMA*. Source: Project Document (PRODOC)

Table 2: Inventory of Gases Stored in Brazil, March 2016

Item	Company	Profile	City	State	Gas type	Qty. 2014 (kg)	Qty. 2016 (kg)
1	Capital Refrigeração	CRA	Porto Alegre	RS		16.150	16.150
2	Frigelar	CRA	São Paulo	SP		300	141
3	Bandeirantes Refrigeração	CRA	São Paulo	SP		4.419	8.675
4	Recigases	CRA	Rio de Janeiro	RJ		13.540	24.000
5	CRN	CRA	Recife	PE		2.247	1.226
6	Revert Brasil	Dismantling and Recycling of Refrigerators	Careaçu	MG		9.000	7.000
7	Tecnitest	Final User	Rio de Janeiro	RJ		120	120
8	Refrigeração Marechal	Gathering Company	São Paulo	SP		4.000	4.712
9	Carrier do Brasil	Final User	Canoas	RS		11.500	5.000
10	Clima Sul	Recycling center	Curitiba	PR		500	
11	IBAMA - SP	Environment Institution	São Paulo	SP		734.400	346.400
	OTHERS:						
12	Zeon	CRA	Rio de Janeiro	RJ		0	8.334
13	IBAMA - RS	Environment Institution	Porto Alegre	RS		0	245
14	Wilhelmsen		Rio de Janeiro	RJ		0	441
	TOTAL					**796.176**	**422.444**

Source: Inventory conducted by the UNDP/MMA Team in March of 2016.

This ODS waste stock is the basic object for management and improvement of high temperature incineration plants, following international and national standards. The implementation of the activities proposed by the Project received approval of financial resources on the order of US$1,490,600.

As the National Plan for CFC Elimination aimed to eliminate CFC consumption in the sectors of refrigeration, foam, aerosols, solvents, sterilizers and metered dose inhalers (MDIs), the projects linked to it promoted the creation of a national structure for collection, recycling and regeneration of refrigerating fluids. This structure is demonstrated by the creation of Regeneration and Storage Centers (CRAs) and Decentralized Recycling Units (UDRs) in the Brazilian states. For putting together this structure, PNC projects donated equipment and instruments for the effectiveness of its activities and were expected to be used by Project BRA/14/G72. In summary, the Plan obtained results listed here and served as a basis for Project BRA/14/G72 implementation, namely:

- Eliminated 10.525 tons of substances with high ODP content;
- Supported the implementation of a system for managing the stock of refrigerant fluids in the country through regeneration centers and collection, recycling and regeneration units of ODS throughout the country, composed of five regeneration and storage centers and 120 recycling units for refrigerating fluids;
- Replaced obsolete equipment in the Chillers and Commercial Refrigeration sector focused on Energy Efficiency capacity and replacement of refrigerants in use in public buildings and commercial establishments respectively;
- Supported the development of ABNT technical standards for the refrigeration sector and other standards;
- Supported the technological conversion of approximately 200 national companies to eliminate CFCs in refrigeration equipment and in the manufacture of polyurethane foam;
- Elaborated the strategy of eliminating the Measured Dose Inhalers (MDIs) produced with CFCs;
- Strengthened the Federal Technical Registry of Potentially Polluting Activities and/or Users of Environmental Resources (CTF/APP) of IBAMA;
- Established a Transition Strategy for Use of CFC-free MDIs; and
- Disseminated technical information on new technologies.

In particular, the Brazilian Government promoted the establishment of norms and procedures for prohibition of CFC emissions contained in Resolution 267/2000 of the National Environmental Council (CONAMA). Other policy instruments that have contributed to ODS elimination include the National Solid Waste Policy, through Law 12.305/2010, which establishes principles, objectives, guidelines for integrated solid waste management, including hazardous waste, and the responsibilities of both the generator and the public authority.

The programs and projects developed with the support of the Multilateral Fund and the Brazilian Government to meet the objectives of the Montreal Protocol resulted, according to the PRODOC for BRA/14/G72, in the collection of 61,776 kg of pure and contaminated CFCs (CFC-12, CFC-11) that are stored in the CRAs as well as some quantities in the Decentralized Recycling Units (UDRs). The PRODOC also cites, according to Table 1, the 734,400 kg of fluorinated substances seized by IBAMA that are to be destroyed.

For the destruction or Disposal of ODS waste, the Project proposed high temperature incineration. However, this destruction involves, in addition to the suitability of the incineration plant, the storage of the existing stocks while the incinerator adjustments are made, and subsequently the transfer logistics for suitable cylinders and transport of this

stock from the storage centers to the incinerator. All these procedures, according to the PRODOC and lessons from the Project implementation, constitute major challenges faced by Project execution. The ODS are stored in tanks and cylinders of different sizes and in different companies and CRAs in the states of São Paulo, Rio de Janeiro, Minas Gerais, Pernambuco, Rio Grande do Sul and Paraná .

The administrative and financial operational challenges that must be overcome to carry out storage activities in different locations spread over large distances in Brazil are enormous. These challenges arise from problems identified in Project formulation, as expressed in the PRODOC, including: a) Lack of understanding about the class of materials and how to classify ODS waste (permit and documentation systems). Ad hoc categorization has been made by the state governments, with different interpretations about the classes of materials. Thus, a load of ODS residue when crossing a state border may find distinct regulations that lead to delays in reaching its destination and therefore to increased costs; b) Lack of adequate vehicles to transport contaminated ODS as well as adequate cylinders or tanks; c) Lack of expertise regarding the handling and labeling of cylinders and rechargeable tanks of ODS contaminated; d) Lack of technical standards for handling, labeling and transport of contaminated ODS; and e) Lack of means for centralized storage of ODS waste, causing diseconomies of scale and inefficiency and contributing to leakage.

Another challenge is putting together the Integrated ODS Waste Management System, which needs to be fed with data on collection, analysis of ODS in the laboratories that should be working in some CRAs, data on storage and consolidation and preparation of the material to be transported. All the data obtained by these procedures must be entered into a database for ODS waste management and Disposal.

Project Component 1, under evaluation, consists of the implementation activities for the consolidation of this Integrated ODS Waste Management System that in its planning needs to obtain and maintain data and information. This system should be complemented by data resulting from training programs and technical assistance on issues of collection, storage, consolidation and transport of ODS waste that also require consolidation and analysis of data in the System.

Component 2 concerns the performance of the ODS waste incineration tests, requiring the qualification of facilities and selection of incineration companies in accordance with international and national standards and analysis of the logistics and costs involved.

It is important to emphasize that the central problem identified and addressed by this Project is the disposal of ODS waste resulting from the initiatives and efforts of programs and projects to phase out CFCs, HCFCs, HFCs and other substances. The relevance of execution of this Demonstration Project of ODS Waste Management and Disposal becomes most evident when it closes the cycle of efforts to eliminate ODS residues.

2.3 Immediate and Development Objectives of the Project

The Project's immediate objective is to ensure correct ODS regeneration, when feasible, and storage of unusable ODS collected and maintained in the selected CRAs, to promote capacity development to receive, regenerate, transfer and temporarily store the ODS with the use of adequate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistics and transportation process, avoiding risks of release or loss of ODS to the atmosphere.

Regeneration and recycling where possible as well as the storage and transport of wasteful ODSs should be managed by CRAs and UDRs that will assist in receiving contaminated ODSs.

The Project's development objectives include the adequacy of thermal treatment equipment to demonstrate the feasibility of ODS destruction in an environmentally correct manner and the structuring of the ODS Waste Management System starting with the consolidation of reference sites for correct regeneration when possible or the correct storage, transport and destruction of the waste ODS.

2.4 Baseline Indicators Established

The following Table 3 shows the Project objectives, outputs, indicators and baseline:

Table 3: Objective, Output, Indicators and Baseline

Project Objective - To monitor the ODS origin collected and maintained in the selected CRAs and promoting the strengthening of their capacity to receive, separate, transfer and temporarily store ODS with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistic and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to provide Disposal of ODS waste.		
Output	**Indicator**	**Baseline**
Component 1 Outcome: Establish an Integrated ODS Waste Management System, including technical assistance for collection, training, storage, consolidation and transportation.		
Output 1.1 Extended ODS waste storage structure.	- Increase of total storage capacity to 20 metric tons.	- Limited storage capacity of 4.4 metric tons.
Output 1.2 Technical material for the management of ODS waste produced.	- Sector with technical information for the ODS waste adequate management.	- Absence of technical reference material for the sector.
Output 1.3 Technical training events for the ODS waste management carried out.	- Sector trained for adequate ODS waste management.	- Need for training for the ODS waste adequate management.
Output 1.4 Technical assistance for the operation of the Integrated ODS Waste Management System.	- ODS waste management system running on CRAs.	- Absence of an appropriate waste management model for ODS.
Component 2 Outcome: Incineration of ODS residues demonstrated.		

Output 2.1 Incineration of ODS residues fulfilled.	- Establishment of one incineration plant.	- Absence of an incineration plant for ODS waste in the country.

2.5 Main Stakeholders

The main stakeholders are state governments and private companies involved in the processes of categorization of material classes, licensing processes and transport operations of contaminated ODS. The main companies are the CRAs and the UDRs that are partners in the actions proposed by the Project and also waste management companies, which will be included in the Project for training and capacity development in the future.

State and municipal governments, associations linked to the sector, companies that collect, recycle and regenerate refrigeration fluids, installation and maintenance companies in the commercial and domestic refrigeration sector, incineration companies, and especially, CRAs and UDRs are stakeholders interested in establishing norms and laws that unify the understanding and procedures for ODS management and monitoring. Thus, these stakeholders are being sensitized to participate in training programs that are being planned and implemented by the Project teams for the various target groups to be reached.

2.6 Expected Outcomes

According to the PRODOC, the components, outcomes and implementation strategies are:

Component 1: Outcome: Integrated ODS Waste Management System, including technical assistance for collection, training, storage, consolidation and transportation.

Reaching this outcome involves achievement of four outputs and fulfilling their respective targets established in the PRODOC. The establishment of the Integrated ODS Waste Management System must have national scope and contain data from the actions of associations and companies collecting, recycling and regenerating refrigerating fluids as well as companies involved in installation and maintenance of the commercial and domestic refrigeration sector and incineration.

The activities developed to achieve the proposed outcomes will include supervision and monitoring of CFC and other alternative substances, characterization of the material, consolidation in cylinders compatible with transport facilities and incinerator installation, safe storage in CRAs and transport to the incineration plants. This initial stage of collection up to storage will not be financed by the financial resources coming from the MLF.

According to the PRODOC, the MLF resources will finance the acquisition of five sets of high-speed fluid transfer equipment and multiple-use cylinders with appropriate steam trap and purge capacity. Training activities for these activities will also be funded by the MLF. Other activities of documenting and reporting the origin of the ODS residues are

necessary for the constitution and coordination of the Integrated Management System as a pilot demonstration activity.

Component 2: Outcome: Incineration of ODS residues demonstrated.

Obtaining this outcome involves the achievement of the output regarding incineration, fulfilling the disposal target of 120 tons of ODS waste. Accomplishing this outcome requires performing incineration tests in the facilities of the selected company, in accordance with national normative requirements, protocols and international standards.

Accomplishment of this outcome will depend on outputs that require execution of activities involving technical evaluation, carried out in partnership by the consultant contracted by the Project and by the incineration plant operator, including:

a) an environmental audit of the facility baseline as well as the current environmental management plan in accordance with national regulations;
b) development of a detailed protocol and incineration test specification; and
c) any needed modifications to the incinerator.

A priority activity of this component explained in the PRODOC is to determine the appropriate feed rate of ODS (allowed chlorine and fluorine content) and the usual waste stream from the incinerator to be treated in conjunction with the ODS, establishing the ideal composition of operation between these factors, so that the feed is in conformity with the standards for feed and atmospheric emissions limits, according to the operating license and the relevant environmental laws and regulations.

The modifications in the company's plant with the incinerator selected should be small, according to the PRODOC guidelines, involving the installation of the furnace feed and the configuration of the cylinder feed system for gaseous waste, with the proper control and registration of operations (automated system), as well the change and purge capacity for the cylinders, among other activities. In the case of CFC-11, the modifications should involve a self-powered system, which may require only a simple connection to the existing nozzle liquid feed system. For the purpose of the burning test and integrity of the input measurement, dedicated power tanks, pumps, metering systems and flow controls will be required, according to the PRODOC.

Also, according to the PRODOC, the baseline regarding incinerator activities will be composed by the incineration test results with the normal waste stream to be discarded and then a burning test with the ODS. Further, according to this document, in each case, a monitoring protocol will be followed including operating conditions, that is, combustion chamber temperatures, estimated resident time and chimney point temperature, the standard menu of regulated emissions, including Dioxin and Furan Emission Potential (PCDD/F) and mass balance inputs, covering all residual release pathways (solid, liquid and gas), analysis of major contaminants, including PCDD/F in solid ash, waste and any residual liquid flow. All these data should be included in the database of the Integrated ODS Waste Management and Disposal System.

These activities, according to PRODOC, seek to determine both Destruction Removal Efficiency (ERD) and Destruction Efficiency (ED), grounding discussions of the ODS Disposal Task Force of the TEAP. It is noted that only CFCs of high vapor or gaseous

pressure are subject to release into the atmosphere, but this still needs to be validated. Likewise, the analysis of PCDD/F and any CFC residual recombinant in any means of liberation can be a useful contribution to the technological knowledge base and information for the ODS Waste Management System Database.

3 Project Findings

3.1 Project Design Formulation

The formulation of the Demonstration Project on ODS Waste Management and Disposal was based on Brazil's commitment, as part of the Montreal Protocol, to carry out actions to protect the ozone layer. Project design considered the need for disposal of ODS stocks, which are formed after the processes of collection, recycling and regeneration of CFCs. These stocks result from projects carried out under the PNC, which created a system for the return of CFCs to the market through collection, recycling and regeneration activities by Regeneration and Storage Centers (CRAs) and Decentralized Recycling Units (UDRs). The design of the Project also predicted capacity building based on problems and actions to address them, resulting in project efficiency and sustainability.

The Project is relevant because it seeks to provide disposal for ODS waste. Thus, project formulation proposed activities for the identification, preparation and consolidation of these substances aimed at the ultimate goal, which is the destruction of ODS waste. The Project was formulated considering the execution of four defined components, which are interrelated, aiming to achieve objectives of: a) improvement of the collection, recycling, regeneration and storage network of refrigerants installed in the country; b) creation of a pilot system for ODS waste management; c) promotion of means for the disposal of non-reusable CFCs, HCFCs and HFCs; and d) conduct training and disseminate information on appropriate forms of Disposal of ODS residues.

The activities were defined considering the existence of associations, companies, CRAs and UDRs created by PNC projects, reflecting the efficiency and sustainability of actions and the achievement of national and global ozone protection objectives.

Therefore, the Project's components include its objectives and activities, contributing to the achievement of the desired and explicit outcomes in the official project document, signed on June 8, 2015, by the Brazilian Government and UNDP.

The Project was prepared specifying the activities to be carried out over a three-year period, with the completion originally scheduled for December, 2017. The final end date will be reviewed by the Substantive Review Document to be presented for approval by the Brazilian Cooperation Agency (ABC) in the middle of 2017 and that is being prepared.

3.1.1 Analysis of the LFA/Outcomes Framework

The Outcomes and Resources Matrix, the Annual Work Plan and the Management Arrangements make up the Project Logical Framework designed to achieve the objectives. Project formulation includes arrangements for management, monitoring and evaluation activities and means of monitoring execution of the financial budget.

The rationale in the Project document is that capacity development and institutional strengthening of associations, companies and, especially, CRAs and incineration companies contribute to the Project's impact.

According to the MTE, in the specific case of this Project, these factors have led to the achievement of outcomes and outputs approaching the final goal of completing the cycle of efforts to eliminate CFCs and ODS waste.

Moreover, according to the MTE evaluator, formulation of the Demonstration Project for ODS Waste Management and Disposal, BRA/14/G72, and its procedures for achieving effective results have made it possible to discuss the importance and relevance of implementing its objectives and actions with the partners and stakeholders involved in the sector and achieve the proposed results.

In this sense, the Project Logical Framework makes it easier to monitor implementation and at the same time to disseminate information that helps raises national and global awareness about the environmental importance of ozone layer protection.

The logical framework provided a plan for the structure of the Project, establishing forms of intervention, procedures and work methods, organized so as to guide execution from the most complex to the most specific activities needed for data collection, processing and analysis about effective ODS waste disposal, as a commitment under the Montreal Protocol.

The objectives and indicators of the logical structure help identify the problems to be faced. According to the MTE, analysis of the Project structure shows that these elements are clear and feasible in order to achieve the Project's outputs and outcomes. In addition, the indicators have guided periodic monitoring of finished and ongoing actions as compared to established baselines.

3.1.2 Assumptions and Risks

According to analysis of data about the activities developed so far in the partial implementation of this Project, the MTE did not identify challenges and risks that cannot be overcome.

Project Objective[2] The immediate Project objective is to monitor the origin of ODS collected and maintained by the selected CRAs, strengthening their capacity to receive, separate, transfer and temporarily store these ODS using appropriate equipment. The actions to achieve this objective should contribute to the efficient establishment of logistical and transportation processes, avoiding risks of release or loss of ODS to the atmosphere and making possible ODS waste disposal.	**Risk:** Large risks were not identified in the implementation of this Project, since its objective of elimination of ODS, mainly CFCs, is in line with the commitment of the Brazilian Government with the Montreal Protocol, as per Federal Decree 99.280 of June 6, 1990. **Assumption:** The Brazilian Government maintains support to implementation of projects linked to the Montreal Protocol.

In relation to the overall objective of this Project, no significant risk was identified regarding implementation of the Project, since the commitments of the parties involved are in agreement and aligned with the ultimate purpose or final objective of elimination

[2] Objective (Atlas output) monitored quarterly **ERBM** and annually in **APR/PIR**.

of ODS waste currently identified in the country that threatens the ozone layer. Therefore, the risks are minimal and reflect shared obligations, including responsibilities under public policies such as the PNRS.

Outcome 1[3] Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.	**Risk:** (1) Coordination with stakeholders may involve difficulties in maintaining, updating and analyzing data, since the Project involves a large number of partners in widespread locations around the country and a large amount of information on ODS collection, regeneration, analysis, consolidation, transportation logistics and ODS results of the incineration of the system feed; (2) Difficulty in hiring qualified personnel to manage the system and carry out training programs. **Assumption:** Activities and outcomes of the Project are within the PNC scope, such as the creation and structuring of CRAs and UDRs. Although some are no longer functioning properly, they can be considered already sensitized partners that can support the development, maintenance and updating of the ODS Waste Management System.

According to the MTE evaluator, there could be more clear definition of the risks to Project implementation. These risks are related to the expected outcomes. The risks involved in Outcome 1 may already be occurring, since the collection of data on the activities developed needs to be systematically recorded in order to contribute to the construction of the Integrated ODS Waste Management System. In relation to the Project activities, data recording was done at the beginning of the Project, mapping the preliminary environmental liabilities of refrigeration fluids and through the control of the inventory liabilities in the CRAs and data on the incineration process of the ODS stocks. The recording of these data should be accompanied by monitoring activities to reduce the impact of delays caused mainly by the large number of partners involved in activities of the sectors covered by the Project.

The assertion that the present Project would benefit from the experience of implementation of PNC projects and their previous communications has been confirmed. The government, as expected, has maintained its support for the implementation of commitments under the Montreal Protocol. However, there were risks of unforeseen delays and lack of credibility because of problems caused by political and institutional changes at the federal level, most of which have been circumvented.

Outcome 2 Incineration of ODS residues demonstrated.	**Risks:** a) There are risks of loss of ODS stored in unsuitable containers, since the ODS waste transportation and consolidation are a challenge

[3] All results are annually monitored by means of the APR/PIR.

	to Project execution due to the fact that these substances are stored in various companies and localities in different tanks and cylinders and come from great distances; and b) Delay in the establishment of norms, laws and harmonized procedures that would result in consistent ODS material categorization and waste storage and transport criteria interpreted consistently by states and municipalities. **Assumption:** (1) These Project stages will benefit from the existence of norms and laws already in force. Those that will still be necessary are already being discussed by the responsible authorities. In addition, the partnership between the UNDP/MMA Project and CETESB for adjustments in the selected incineration plant would facilitate obtaining environmental licenses. CETESB would support the adjustments necessary to operate the incinerator, in order to comply with the agency's technical guidelines and standards.

According to the analysis carried out by the MTE, the partial achievement of Outcome 2 required preparatory activities, namely, the selection of qualified companies to carry out incineration, meetings to define the time of ODS burning for each ODS to be destroyed, requesting an investment plan to reduce unforeseen risks, establishment of a contractual instrument and equipment specifications for ODS storage. All of these activities implemented by the Project through the implementing agency and the coordinating institution involve precautionary and control actions needed for reaching Project outcomes.

In this way, the preparatory activities carried out by the Project team involved the identification, selection and establishment of interactions needed for effectiveness of the necessary institutional arrangements and reduction of vulnerabilities in reaching the proposed objectives. The expected risks are real, since socio-economic and political support from the private sector and government and the hiring of qualified specialists are problems that must be tackled in order to be able to reach outcomes.

3.1.3 Lessons from Other Relevant Projects

Project BRA/14/G72 on ODS Waste Management and Disposal has obtained inputs from lessons learned from other projects of both the National Plan for CFC Elimination (PNC) and the Brazilian HCFC Phase-Out Program (PBH). The projects that supported the implementation of the CFC and HCFC elimination provided data of great importance for the formulation and implementation of this Project in Mid-Term Evaluation.

The inputs and lessons from the implementation and results of the CFC regeneration and recycling process have become the central point of the refrigeration sector. Regeneration of refrigerant gases has become a well-developed process in the contamination treatment system, but the regenerated gas needs to be approved in a laboratory test and the disposable waste must be stored in it’s the right kind of cylinders. The regeneration plants implemented by the PNC were qualified for this analysis and once they are certified, the

gas can be applied in any refrigeration system. The lessons learned from this process were central to Project BRA/14/G72.

The entire process developed by the Regeneration and Storage Centers made clear the importance of technological diffusion that involves new technologies and alternative refrigerant fluids. Furthermore, the establishment of Technical Norms helped legitimize sector procedures and regulations. Standardization of domestic and commercial refrigeration equipment has been carried out and is highly relevant. This applies both to the quality of the refrigerants and to the standardization of the sector's performance, as well as international standards for assessing the purity of fluids and the environmentally appropriate final destination of equipment containing CFCs. Therefore, the results of PNC projects have generated very useful lessons learned for formulation and implementation of Project BRA/14/G72 as of its Mid-Term Evaluation.

The results of the Good Practice Training Project have raised sensitivity and awareness among refrigerator manufacturers and those involved in the process of CFC elimination. The experiences and lessons learned from the implementation of these projects constitute inputs and benefits to achieve the objectives of the ODS Waste Management and Disposal Demonstration Project. Thus, in general, the National Plan for the CFC Elimination (PNC) projects contributed to the following items, as described in its final evaluation:

- contribution to establish a sustainable structure in the country to manage its CFC stocks, with CRAs and UDRs as an example for HCFC management;
- promotion of regulatory actions that resulted from discussions with the impacted sectors, seeking forms of participation by establishing effective partnerships;
- establishment of interaction with the private sector, through formal instruments to ensure the execution of planned activities, such as contracts and partnership instruments;
- establishment of a donation process and financial incentives to provide equipment for recycling development of refrigerating fluids; and
- promotion of target group sensibility and awareness of environmental problems of CFCs through the Training Program and its components, as well as improving the quality of RAC maintenance services. These programs involved stakeholder participation from the beginning, promoting their engagement, proving to be essential for achievement of the objectives proposed by this Demonstration Project on ODS Waste Management and Disposal.

With regard to lessons learned about administrative-financial operational issues, the PNC defined an important resource transfer mechanism to be analyzed by the BRA/14/G72 team. The delay in the transfer of resources to the companies resulted in a significant cutback in project implementation. Because of this, UNDP found a way to guarantee the transfer of resources through a service contract with PBH beneficiary companies. This contract sealed an agreement that the company would provide the service to carry out its own conversion.

All these administrative procedures are inputs and lessons learned from previous projects that are important to BRA/14/G72. Decisions taken by the PNC and PBH and executed administratively and financially by UNDP, the implementing agency for these projects, may be considered in the procedures applied to Project BRA/14/G72. On the other hand, administrative-financial processes to support the Project implementation can be lengthy and can result in delays in outputs and outcomes to be reached.

A highlight regarding the benefits derived from the lessons learned by the PBH regards the use and maintenance of the infrastructure established by the PNC for both regeneration and recycling of CFCs and HCFCs.

All previous project results provided important inputs and lessons learned that contributed to partial implementation of Project BRA/14/G72 now in Mid-Term Evaluation and contributed to better understanding of the issues.

Other benefits can be derived from experiences and exchange with other projects such as BRA/08/G32 on "Establishment of PCB (Polychlorinated Biphenyls) Waste Management and Disposal System." Although the PCB project deals with Persistent Organic Pollutants (POPs), its management procedures provide important contributions to Project BRA/14/G72. In addition, the Communication Plan established by this project can be a model for implementation of information dissemination programs about ODS waste in Project BRA/14/G72. Thus, Project BRA/08/G32 provides significant contributions for implementation of Project BRA/14/G72 in order to achieve its final objective of destruction of ODS waste with efficiency, effectiveness and sustainability.

In short, lessons learned and successful experiences from other ongoing or finalized projects are highlighted in this BRA/14/G72 Mid-Term Evaluation. Many lessons learned from the aforementioned projects have been and will be fundamental to the implementation of this Project, incorporating and seeking to exchange experiences and promoting conditions for knowledge and actions to address vulnerabilities regarding ozone layer protection.

3.1.4 Planned Stakeholder Participation

The partnerships established by the Demonstration Project on ODS Waste Management and Disposal were the result of the careful selection procedures of companies qualified to participate in the process of ODS waste management and destruction. Here also the lessons learned and the success and good performance of the PNC projects were important for the consolidation of the partnerships, especially the one established with the private sector for incineration and the partnerships established with the Brazilian Government in conjunction with UNDP as well as cooperation agencies such as the German Agency for International Cooperation (GIZ).

It can be seen that the country's experience in obtaining a rapid reduction in CFC consumption was due to the convergence between the financing granted by the MLF and the partnerships established by specific projects. This partnership with the Fund has been relevant to the achievement of Project BRA/14/G72's final objective.

The partnerships established with the Brazilian Government in which the Ministry of the Environment is the coordinator of the Project on ODS Waste Management and Disposal have demonstrated their efficacy and effectiveness by the enforcement of regulations and national standards that have guided the companies involved in the implementation of this Project to date. Other standards and procedures should be established by this partnership and will undoubtedly support the achievement of the ODS waste disposal.

3.1.5 Replication Approach

According to the present Mid-Term Evaluation, implementation of Project BRA/14/G72 activities can lead to widespread replication, mainly through the dissemination of information at the national and local levels and to other developing countries. The publications, the Project website and the Project results dissemination showing the process of obtaining the result of the ODS waste disposal are a solid basis for replication at the national, regional and international levels.

The Integrated ODS Waste Management System, which will be composed of all data and information on ODS waste management and disposal, is being established by the UNDP/MMA Project team and partner actions and will provide data on the Project logistics of the management system related to the consolidation, issues of increase and reduction of storage capacity, transportation and ODS waste incineration. The system as a whole will be replicated at the national and international levels, providing lessons learned in the process as successes and challenges faced by the project implementation. Therefore, the data system will be a solid and transparent source for multi-level replication. In addition, this integrated system will be an extremely useful tool for the formulation of environmental public policies, generating scientific knowledge and contributing to the adoption of mitigation measures. At the moment and according to the Evaluator, the system is under construction.

The process of achieving the result of Component 2, ODS residues incineration, can also be replicated. Incineration tests at the Company's Essencis Soluções Ambientais incinerator facilities, qualified to perform the activities of ODS destruction, is a potential source of procedures to be replicated.

The Evaluator identified that preparatory activities have been carried out for the improvement of incineration plants, the application of national and international normative requirements and protocols, as well as the preparation and establishment of specific and adequate standards for procedures for ODS waste incineration. Therefore, this technical evaluation on the conditions of equipment and procedures for incineration is being effectively carried out by the representatives of the partnerships, companies, UNDP and Brazilian Government, including: a) environmental audit of the facility baseline and environmental management plan, according to national regulations; b) activities for the development of a protocol and specifications for incinerator burning tests and; c) preparation for making necessary modifications in the incineration plant. In addition, some procedures for determining the appropriate ODS feed rate are being performed.

All this experience regarding destruction through effective and efficient operation of the ODS waste incinerator may be replicated by other incinerators to be installed at the national and international levels. For these replications, the program of communication and dissemination of the experiences acquired will be of great importance.

3.1.6 UNDP Comparative Advantage

UNDP is known in Brazil for its efficiency in implementing international technical cooperation projects. The existence of a Project implementation unit with a dedicated team and expertise on the subject gives the UNDP a comparative advantage, acting in

close coordination with the Ministry of Environment, which is responsible for coordinating ozone issues in Brazil. It is evident that UNDP has a large and long experience in project implementation and, in this case, presented a comparative advantage, mainly in the selection of specialists for the BRA/14/G72 implementation team. However, the selection of professionals at the lowest price and not at the best price may affect the quality of the team. In this sense, the comparative advantage of UNDP, with its efficient and transparent procedures and standards, is evident in relation to other project implementation bodies.

Although this advantage is clear to the MTE, the management of administrative and financial activities developed and to be developed at the implementation level and others at the execution level can cause delays in the execution of activities. The centralization of financial performance to the development of activities together with partner institutions can and has sometimes created difficulties for the co-management process of products and project results in the timeframe determined in Work Plan. However, it is always necessary to assess the capacity of partner institutions to perform technical and administrative functions. It is clear that UNDP has great and long experience in project implementation and, therefore, has a comparative advantage.

3.1.7 Linkages between Project and Other Interventions within the Sector

The Demonstration Project on "ODS Waste Management and Disposal" has links to several other projects dealing with ODS waste destruction. Visits to these projects, such as the one carried out in Colombia by the "Pilot Demonstration Project for the Integral Management of Waste from Ozone Depleting Substances," with UNDP as the implementing agency, will provide useful information and inputs, mainly procedures for the installation and implementation of incinerators.

For example, the experience gained from the interaction with the UNDP/Colombia project provided data on the performance of the burning tests and the time of burning of ODS waste incineration. The document "Environmental Guidelines for the Chemicals Hazardous and Waste Hazardous Storage and Road Transport" provided for analysis by the BRA/14/G72 Project team contains information on ODS waste storage and transport that has been of great value to the Project team.

Further information on tests for refrigerant gas burning was provided by the UNDP/Colombia project. Regarding the gas flaring test, the information provided is that the Colombia project has carried out tests that allow evaluating the current performance of the furnace, but they have not yet performed tests for ODS waste.

One of the necessary instruments to identify gas refrigerant chemical composition is the chromatograph, but it is not enough, according to the Colombia Project technicians. The project team also provided guidance for the purchase of other equipment, such as that used to identify refrigerant gases like CFC12, HCFC-22 and HFC-134a.

Also, according to the guidelines of the Colombia Project, to verify the type of refrigerant before the firing test, the individual characterization of each container is important. For this purpose, a chromatograph with a halide column is generally used. Regarding ODS waste transportation and forms of storage, some information were also passed on.

Technical standards for transportation have already been defined by the Colombian government and may be useful for the improvement of norms and regulations developed or to be developed by the Brazilian Government regarding ODS waste destruction.

Other partnerships are already under way, such as the negotiations with the Environmental Sanitation Company of the State of São Paulo (CETESB). According to its website, this institution's mission is promoting and monitoring the implementation of environmental and sustainable development public policies, ensuring improvement of environment quality. In addition, it seeks to improve standards of excellence in environmental management and services provided to users and the general population in the environmental field and in the protection of public health. Contacts with the institution were held on April 17, 2017, through a meeting attended by MMA, UNDP representatives and the CETESB Climate Change Division. At this time, the BRA/14/G72 Project presented its current and planned activities and discussed the incinerator feasibility and adequacy of the Essencis Soluções Ambientais company to perform ODS waste destruction.

After formalization of the partnership among CETESB, UNDP and MMA, through official letter, it is also expected that this partnership will support the training program, an activity proposed by the Project in Component 1.

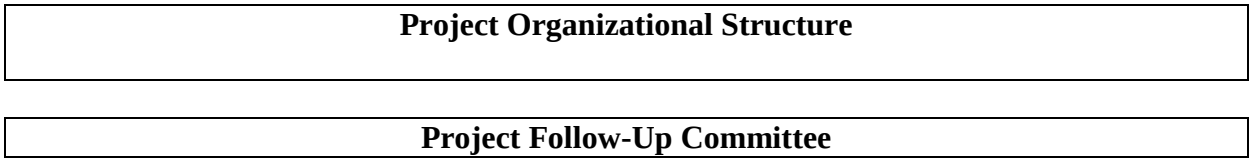
In addition to these projects and institutions, the Project may include contributions from other projects such as the aforementioned Project BRA/08/G32 on "Establishment of PCBs (Polychlorinated Biphenyls) Waste Management and Disposal System", with regard to past and ongoing experiences regarding toxic POPs management and monitoring.

3.1.8 Management Arrangements

The planned and ongoing actions within PRODOC framework have been possible through the management arrangements established to carry out ODS waste management and disposal.

Figure 1 below shows the management arrangements established in the PRODOC that constitute the Project organizational structure.

Figure 1: Project Organizational Structure



MRE/ABC	**UNDP** **- Project quality control** **- Implementation and Monitoring Unit**	**MMA/SMCQ/DEMC/GPCO**

UNDP is the implementing agency for Project BRA/14/G72 in the direct execution modality and its implementation arrangement has been guided by the standards and procedures of the Results Management Guide (GGR). The MMA/SEMCQ/DEMC/GPCO structure for the technical coordination of the actions contained in the Results and Resources Matrix in the PRODOC and specified in the Annual Work Plan could be changed in the Project Substantive Review.

The Brazilian Government is represented by both the MMA and the Brazilian Cooperation Agency (ABC/MRE) and is responsible for monitoring the actions of this Project, through the analysis of annual reports in electronic form (RPE) of the Monitoring Information System Projects (SIGAP) and regular visits and meetings with UNDP and MMA, verifying compliance with the Project's objectives, targets and outcomes.

In addition, ABC approves Substantive Reviews whenever the Project requires adjustments in the PRODOC, proposed by both MMA and UNDP.

The MMA, through the Ozone Unit responsible for Project coordination, appointed the technical team to work with UNDP in Project implementation, to monitor and evaluate its development, to work together with UNDP on the Activity Plans (PTA/UNDP) and annual budgets and participate in making the necessary adjustments to achieve the expected results. It has also prepared and approved terms of reference and technical specifications for contracting consultants, procurement of goods and rendering of services necessary for the Project activities implementation. The MMA team should evaluate the products and goods delivered and services provided by companies and consultants, according to technical and qualitative criteria. In addition, MMA participates in selection and evaluation committees of companies and consultants, when necessary and in accordance with UNDP rules. It shall propose to ABC/MRE and UNDP any necessary modifications and adjustments to the Project for its smooth running and prepare, together with UNDP, the Annual Implementation Report (Progress Report) and the Annual Work Plan, submitted to ABC/MRE and the Executive Committee of the Multilateral Fund for Implementation of the Montreal Protocol (ExCom). In addition, the MMA in conjunction with UNDP reviews the Project Final Report, which is also presented to ABC/MRE and ExCom.

UNDP acts as the implementing agency responsible for implementing the actions as described and explained in the PRODOC. UNDP is responsible for the following activities: a) Project technical and administrative coordination and implementation, in line with the activities planned and approved in the Annual Work Plan; b) preparation, together with the MMA, of the Project activity plans (PTA/UNDP) and annual budgets, suggesting reallocation of resources and budget revisions when necessary; c) availability of specialists from its regular staff and/or hiring consultants to monitor the Project implementation in accordance with the Annual Work Plan and the activities included in the PRODOC; d) administrative actions processing necessary to achieve Project BRA/14/G72, observing criteria of technical quality, costs and deadlines; e) manage the

Project financial resources following its accounting and financial procedures, in accordance with UNDP rules and standards; f) preparation of proposal and presentation to ABC/MRE and MMA of the modifications and adjustments necessary to the good Project progress; g) MMA's quarterly financial reporting of project execution; h) preparation, together with the MMA, of the Annual Implementation Report (Progress Report) and Annual Work Plan, which is annually submitted to the ABC/MRE and ExCom analysis and other parties involved and measures to be taken for the Project Final Report.

Project Monitoring Committee (CAP)

According to the PRODOC, the Project has a Project Monitoring Committee (CAP), with UNDP, MMA and ABC/MRE representatives and their respective substitutes. The Committee assignments are: a) to participate in meetings for evaluation of new projects, as well as for project substantive revisions evaluation or finalization; b) to analyze and discuss the execution of Project activities and suggest modifications as necessary; c) to hold tripartite meetings to discuss the progress reports, action plan and final report to be approved by the Executive Committee for implementation of the Montreal Protocol (ExCom); d) to hold meetings to evaluate new projects, discuss the PRODOC issues, as approved by the ExCom; e) analyze the results achieved; and f) settle disputes.

UNDP has been responsible for convening the meetings of the Project Monitoring Committee.

Implementation Strategy

According to the MTE, the MMA technical team has coordinated the Project activities approved by the Executive Committee and contained in the Annual Work Plans and to be carried out by the Implementation and Monitoring Unit (UIM/UNDP) within the Project scope. UIM/UNDP technical experts and the General Coordinator of the MMA Technical Team have been responsible for identifying and developing new partnerships and linkages with other government projects or programs that support or complement the results of Project BRA/14/G72, as set forth in the PRODOC.

As a Direct Execution Project, the execution of administrative and financial services, including authorization of expenditures, has complied with UNDP rules, standards and procedures. UIM/UNDP has been responsible for planning and execution of technical and operational actions, contract supervision and other administrative duties, as well as financial and administrative management of approved activities.

Project Audit Arrangements

Independent auditing contracted by the Project has been carried out as provided for in UNDP rules applicable to direct execution projects. Under this project modality, the UNDP Brazil office has been responsible for the full implementation of UNDP rules and procedures in Project execution, monitoring and evaluation. The office has made available and maintained records about the Project in institutional databases.

Review Mechanisms

The financial reviews have been signed by the UNDP Resident Representative in Brazil, which are: a) reviews reflecting more realistic estimates of financial implementation for the current year and to reschedule the remaining resources for the coming year that do not represent a change in the amount of the total budget; b) annual mandatory reviews, reflecting expenditures made during the previous year that do not change the total budget amount, the Project timeframe or its substantive nature; c) simplified reviews. Other revisions require the signature of the three parties involved in the Project implementation and coordination.

Monitoring and Evaluation

According to the Evaluator, the monitoring has included provision of regular information to the MMA technical coordination. The Annual Implementation Report (Progress Report) and the Annual Work Plan have been and are being prepared and submitted for evaluation by the Multilateral Fund Secretariat, followed by an Annual Tripartite Meeting (TPR) of the Parties involved in the Project.

The MMA has prepared the Electronic Progress Report (RPE) for the technical module of the Project Management Information System (SIGAP) every six months, reflecting the Project's physical performance, that is, the achievement of the programmed physical goals.

The monitoring of indicators of the Results and Resources Matrix has been carried out by the UIM/UNDP and its inputs have oriented adjustments to the Project activities, providing the basis for decision making. This has enabled monitoring and evaluation results that supported the planning and implementation of actions at the local level.

In accordance with the program policies and procedures described in UNDP's Guide for Results Management (GGR), the Project has been monitored through: a) regular meetings between the UIM/UNDP and the MMA team to monitor Project progress; b) semi-annual quality assessment recording the progress made on the basis of quality criteria and methods defined in the Quality Management Framework and in the Atlas system; c) Project Issues Register (Issues log) activated in Atlas and updated by the UNDP Project Manager; d) based on the risk analysis, a Risk Register has been updated in Atlas; e) based on the information recorded in Atlas, a Semiannual Progress Report has been prepared by the Project Manager through Project Quality Control using the standard report available in the Executive Snapshot (Atlas); f) a Lessons Learned Log has been activated and updated in Atlas, ensuring learning and constant adaptation within the organization, and facilitating the preparation of the Lessons Learned Report at the end of the Project; g) a Monitoring Plan has been activated and updated in Atlas, tracking the main management actions and events.

The results of this MTE should provide inputs for final evaluation of the Project, verifying if the objectives have been achieved and if the outcomes sustainability will be effective and identifying lessons learned as inputs to other projects.

3.2 Project Implementation

3.2.1 Adaptive Management

Adaptive management is a structured and systematic process for improving management during project implementation, as well as making improvements to management decisions, policies and practices, learning from outcomes and outputs related to Project objectives.

Project BRA/14/G72 on ODS Waste Management and Disposal was formulated with precise and specific objectives and means to obtain results and products, as defined in the PRODOC.

During Project implementation, some revisions may be necessary, but only in terms of altering product delivery dates to achieve the final results. The revisions must be submitted to and approved by the Brazilian Cooperation Agency (ABC).

According to the MTE and considering that this item refers to changes in the design of the Project and in its results, the implementation of the Project, to date, has not changed. However, there was need for management of material and adaptations, such as the inclusion of laboratory equipment and materials needed for validating the purity of the regenerated substance. In addition, changes were also made in relation to the capacity of the cylinders and safety locks, according to expert decisions. As already mentioned, this is a demonstration project with the involvement of various actors from the private sector in different locations, and the expected products depend on the collection of data and information, processing and production of adequate materials for the dissemination and training foreseen in the Project.

3.2.2 Partnership Arrangements

According to the MTE, partnership agreements have been important for the implementation of the Demonstration Project for ODS Waste Management and Disposal and are parts of the proposal.

It is important to recognize the involvement of associations, private companies, CRAs and UDRs in the discussions and implementation of actions to collect, regenerate and recycle ODS waste. This involvement means that information on actions to protect the ozone layer from greenhouse gas emissions and their environmental consequences is obtained and internalized through guarantees of accuracy, transparency and safety in dealing with ODS waste.

This is demonstrated by the Project institutional arrangements, where projects of the National Plan for CFC Elimination (PNC) played an essential role. In this sense, the private sector mobilization strategy involved partners who benefited from the increase in knowledge about the sector, not only by the facilities and equipment purchased by donation, but also by the training programs carried out. The BRA/14/G72 Project has its implementation based on this infrastructure and on previous and currently acquired knowledge.

The partnership arrangements have established UNDP commitments, as well as the four selected CRAs, namely Recigases, CRN, Frigelar and Ecosuporte, which will receive investments to improve facilities with new equipment donated by the Project and these have agreed to adapt the physical space for equipment installation, especially for the chromatograph installation, places to install helium gas cylinders and work benches in protected locations, without interference such as noise, dust and vibration. The performance of laboratory analysis of ODS fluids requires the work of a chemist, who also constitutes a counterpart of the established partnership, being a commitment made by the CRAs. The equipment is being purchased by the Project, as necessary for the installation or improvement of the facilities of the laboratories of these selected CRAs, in accordance with the objectives of Project BRA/14/G72.

Likewise, the company selected through an Expression of Interest (MI) to be an ODS waste incinerator launched by the Project was Essencis Soluções Ambientais, which will receive investments for adaptation of its incineration plant. These adjustments in the facilities include receiving equipment and supporting environmental licensing procedures and training such as:

a) installation of a line for gas burning, with all the infrastructure;
b) gas burning test (inputs, sampling, analysis);
c) adequacy in the storage area and training for the handling of pressurized cylinders;
d) support for obtaining environmental licensing of adjustments and improvements;
e) support for incineration of ODS.

The incineration company, Essencis Soluções Ambientais, is committed to preparing the budget for operational adequacy through the formulation of an Investment Plan.

Thus, partnership arrangements presuppose commitments of parties' involved in the implementation of activities aimed at obtaining the outcomes established in the PRODOC.

3.2.3 Feedback from M&E Activities used for Adaptive Management

Considering that Project BRA/14/G72 for ODS Waste Management and Disposal has a pilot and demonstrative character, as already explained, in accordance with the commitment made by the Parties to the Montreal Protocol, through the decision of the 57th Meeting of the ExCom and with approval of resources for the implementation of this Project, it was not necessary to apply the procedures for adaptive management. The objectives were set by this meeting, which defined that the pilot projects could cover the collection, transportation, storage, management and final destination of ODS, focusing on the existing stocks with high potential for damage to the ozone layer and global warming.

It is also assumed that demonstration projects are viable and already have effective waste management procedures and plans for preventive actions. Once the commitments established by the country are being met, according to the MTE, comments on M&E activities are not necessary for the application of adaptive management procedures.

3.2.4 Project Finance

The Demonstration Project on "ODS Waste Management and Disposal" in Brazil, as mentioned above, has the MMA as its coordinating agency and UNDP as its implementing agency. In approving the Brazilian proposal for the Project implementation at the 72nd ExCom Meeting, held in May of 2014, resources were allocated in the amount of US$1,490,600 from FML for the improvement of facilities for regeneration and storage and high-temperature incineration plants according to international standards. These improvements have used cost-effectiveness parameters, taking into account the incremental costs inherent in the consolidation process, including transportation costs associated with consolidating inventories of ODS waste, as described in the PRODOC. These resources have been used in accordance with the budget approved by MMA/ABC/UNDP and have been planned and disbursed in accordance with Annual Work Plans.

The funds have been used in accordance with budget provisions by outcome/output and have been monitored by UNDP as the Project implementing agency. The Project Management Unit has been responsible for financial monitoring and administrative coordination, overseeing and monitoring expenditures, equipment purchase and product delivery, in accordance with the M&E Plan inputs.

A table with project budget specifications is presented below.

Table 4: Project Performance - 2016

Project 00084741 **Project Title: BRA/14/G72 – Demonstration Project for the ODS Waste Management and Disposal.**					
Product	**Key Activities**	**Start/ Year**	**End/ Year**	**Planned Budget US$**	
00092617 – ODS Waste Management System	ODS Waste Management System	2014	2017	71300 Local Consultants: 72100 Company Service Contracts: 71400 Individual Service Contracts:	**50,000.00** **358,080.00** **40,000.00**
	Project Administration	2014	2017	71400 Individual Service Contracts: 71600 Travel	**30,000.00** **30,000.00**
	Technical Assistance	2014	2017	71300 Local Consultants: 71600 Travel	**40,000.00** **25,000.00**
	Burning Test and Installations	2014	2017	71200 International Consultants: 72100 Company Service Contracts:	**50,000.00** **439,000,00**
TOTAL					**1,062,080.00**

Source: Annual Work Plan, Report on April 8, 2015

Table 5: Financial Performance per Year

Project: 00084741 **Executing Agency: PNUD/DEX** **Project Title: BRA/14/G72 – Demonstration Project for ODS Waste Management**						
Result	**Activity**	**Yearly Expenditures (USD)**			**Expenditures**	**Balance**
		2015	**2016**	**2017***		

Waste Management System	1	75.82	71,409.25	15,369.89	**86,854.96**	**453,521.20**
Burning Test and Installations	2		17,313.60	83.81	**17,397.41**	
Technical Assistance	3		24,609.49	5,243.85	**29,853.34**	
Project Administration	4	7,887.11	45,121.69	20,524.91	**73,533.71**	
Encumbrance (POs)				829,439.38	**829,439.38**	
Exchange difference (kk/AAA)				1,039.24	**1,039.24**	
TOTAL		**7,962.93**	**158,454.03**	**870,661.84**	**1,037,078.80**	
Project Total					**1,490,600.00**	

**** expected/planned***
Source: ATLAS System

3.2.5 Monitoring and Evaluation: Design at Entry and Implementation

As explained in the PRODOC, monitoring and evaluation have been carried out by UNDP under the Direct Execution (DEX) modality through the Implementation and Monitoring Unit (UIM/UNDP), with coordination by the MMA.

Monitoring has consisted of systematic accompaniment the implementation of activities to achieve the outcomes proposed in Components 1 and 2, in accordance with the Project objectives, as well as through the preparation of periodic reports in accordance with UNDP standards. The data for the reports have been obtained through contacts with the partners involved in the Project as well as meetings and field visits included in the work plans.

In addition, the monitoring and evaluation of the implementation of the Project has been systematically carried out by means of the progress reports submitted to the Multilateral Fund for the Implementation of the Montreal Protocol (Donor Fund)

UIM/UNDP and MMA have worked together to provide information and data that should form part of the Mid-Term Evaluation report, reflecting the ongoing monitoring and evaluation activities of the components of Project BRA/14/G72 and its outcomes, in order to achieve its objectives within the timeframe proposed in the work plan. The guarantee of compliance with the Project's outputs and outcomes also depends on compliance with the proposed indicators, baseline data and final objectives to be satisfactorily achieved.

Information management for the construction of the ODS Integrated Waste Management System has also involved the Project's partnerships and the commitment of the MMA/UNDP team, seeking to systematize and record the data and information needed to obtain the Project outputs and outcomes. The collaboration of the various actors involved in the implementation of the Project has ensured the monitoring and periodic evaluation of the activities proposed by Project BRA/14/G72.

In conclusion, the results proposed by Components 1 and 2 are oriented towards reaching the outputs proposed in the PRODOC and according to "SMART" criteria, namely:

- consistent with the specific nature of the issues involved and presented in language accessible to the groups involved in the Project partnerships, with transparency and precision.
- planned in accordance with the established and relevant indicators to comply with the commitments established by the country with the Montreal Protocol;
- compatible with the capacity of the partners involved in the implementation;
- relevant at the local, national and international levels and have contributed to the priorities set out in the Montreal Protocol; and
- achieved in such a way that the outcomes are not an end in themselves but the basis for continuous improvement of information, data and other findings aimed at reducing the impacts of harmful substances on the atmosphere and damage to the ozone layer.

3.2.6 UNDP and Implementing Partner Implementation/Execution, Coordination and Operational Issues

UNDP and Partners Implementation

As already mentioned, UNDP is an institution recognized in Brazil for its efficiency in implementing international technical cooperation projects. Some operational problems have been identified during Project implementation with regard to delays arising from specific needs for the Project execution team formation and rigid bureaucratic procedures on bidding and procurement rules for materials necessary for implementation, causing delays in administrative and financial performance. These delays have sometimes caused postponements in reaching outputs and outcomes, although these mishaps may have arisen from the difficulties in importing equipment or in-country procurement as well as problems in specification of instruments and equipment or changes in the Project strategy.

However, according to the MTE, these problems have been minor in relation to the scope and complexity of the activities proposed and performed by the participants in relation to governmental and private institutions and in relation to the established commitments. They depend on the information obtained in the field or through the application of specific methodologies for the construction of, for example, Integrated ODS Waste Management Systems and methods of incineration of these substances. In addition, the Project's focus on ODS waste disposal has been pursued according to the adequate means to achieve the outputs and outcomes proposed in the PRODOC.

Furthermore, according to the MTE consultant, the UNDP Project Implementation and Monitoring Unit (UIM) has carried out activities to support the implementation of partners, assisting in the development of terms of reference and in the preparation of meetings and travel for data and information collection and participation in events, among other activities. While some delays have been identified in these and other procedures, they have not prevented actions towards reaching outputs and outcomes.

The progress reports have been prepared with the support of UIM/UNDP and their contents correspond to the facts and factors involved in Project implementation. As already mentioned, the MMA is responsible for the semiannual preparation of the Electronic Progress Report (RPE) referring to the technical module of the Management Information System for Project Monitoring (SIGAP), reflecting the physical performance of the Project.

With regard to the length of Project implementation, UNDP and MMA have spared no effort to ensure that deadlines are met, even though there has been delay in initiating implementation, and that preparatory action has been necessary with partners and their institutions seeking results effectiveness. Therefore, the delays have been compensated with effectiveness in the preparatory actions to achieve the Project outputs and outcomes, being under control both at the level of the actions of the partner institutions and the actions executed by the government, such as the establishment of norms and regulations for ODS waste disposal.

According to the MTE conclusion, the implementation and monitoring of the activities can be considered **Satisfactory (5 pts).**

Coordination of implementation and operational issues

As for the coordination of the partners' execution, the Regeneration and Storage Centers (CRAs) selected by analysis of the Expressions of Interest (Recigases, Frigelar, CRN and Ecosuporte) and the institution selected for the ODS waste incineration (Essencis Soluções Ambientais) have been accompanied in their preparatory actions established both by the implementation team and by Project coordination. According to information from the implementation and coordination team, the CRAs are developing activities such as those that characterize their operation and commitments established with the Project, namely:

- commitment to the temporary storage of the ODS waste until their transport to the final destination in the incinerator;

- commitment to the transfer and cleaning of tanks and cylinders including: remuneration for the service of ODS transfer from non-standard cylinders to new and standardized tanks containing temporarily stored ODS, in order to avoid or minimize losses during storage time, in accordance with the pre-requisites included in the invitation letter for the selection of these institutions.

Regarding the assembly or complementation of equipment for the operation of laboratories for unserviceable substances at the CRAs, counterpart commitments of the partners and donation by UNDP/MMA were established, as explained below:

1. **CRAs counterpart commitments:**

a) provide physical space with adequate minimum facilities in accordance with the guidelines contained in the **Guide for Infrastructure of the CRA Laboratory**, prepared by the specialized consultant hired by the Project and made available for use;

b) maintain, necessarily, a Responsible Technician (RT) of the Chemistry area, with registration in the Regional Council of Chemistry (CRQ), for the handling of equipment, ODS laboratory analysis, issuance of reports and laboratory maintenance of equipment in general;

c) present the purity reports of regenerated fluids for a period of one year after their completion;

d) be available to perform tests and analyzes regarding the ODS final destination to be incinerated, for the same period (one year after its completion);

e) be available to receive visits and audits within the scope of the Project;

f) participate in the Brazilian ODS Management System, with data and information from the developed actions;

g) contribute to the dissemination of data on the issues addressed by the Project and the training programs under the Project.

2. UNDP/MMA and Essencis Soluções Ambientais Company

As already mentioned, this company was selected through the Expression of Interest launched by the UNDP/MMA team. It therefore undertakes to carry out and execute certain adaptations, control the burning tests, carry out the ODS waste incineration and carry out its tasks with support from UNDP/MMA. These actions are listed below:

a) install a feed system for gaseous wastes, including expenditures on materials, equipment and labor;
b) tailor the flushing system for greater efficiency in the removal of dioxins and furans, including material and labor costs;
c) conduct a Burn Test to verify ODS Destruction Efficiency, including specialized laboratory expenses, sampling and issuance of the report, according to the specific parameters required by Brazilian law and the Montreal Protocol.
d) obtain environmental licensing of modifications made, including expenses for obtaining new licensing in the environmental agency, after changes made in the incinerator and approval in the burning test.
e) incinerate the ODS and emit a "Certificate of ODS Waste Destruction (CDR)."

3. Other Company Counterpart Contributions:

a) provide specialized manpower of its staff to analyze the changes that need to be carried out in the incinerator;
b) stop operations as needed to carry out the necessary changes in the incinerator;
c) stop operations in order to carry out burning tests;
d) provide specialized workforce of its staff to prepare a new application for environmental licensing after changes are made in the incinerator and approved in the burning test;
e) carry out ODS destruction and present a certificate of proof;
f) be available to receive visits and audits within the Project scope;

g) participate in the Brazilian ODS Management System, providing reliable data and information about the activities developed;
h) contribute to dissemination and disclosure of information and data and with training programs within the Project scope.

Other activities are foreseen in the PRODOC, many of which have already been implemented as preparatory actions for the Project implementation in order to reach the outputs and outcomes of Components 1 and 2.

In this way, other investments are being executed or are in preparation for their execution, as follows:

a) prepare the final destination logistics (both in the CRAs and until reaching the incinerator): ODS transport service (Origins: CRAs - Destination: Incinerator) that include preparatory actions to leave the incinerator ready and properly licensed for substance destruction.

These actions also incur relevant expenses for the Project and constitute a UNDP/MMA counterpart contribution. This service is being contracted through a bidding process, in accordance with UIM/UNDP rules and procedures.

b) schedule training for all those involved in waste management: CRAs, UDRs, waste disposal companies and waste management companies, state and federal environmental agencies and others.

This service is being prepared with data and information from the execution of the activities of the partners involved in the Project. With the information and data and the planning of the training and capacity development, these activities are being contracted according to the UNDP rules and procedures.

c) disclose the Project actions and the data of the ODS Waste Management System: written materials were prepared and others are being prepared, lectures held, use of written and oral media and other means. Some of these services were carried out by the UNDP/MMA team and others should be contracted in accordance with UNDP/MMA rules and procedures.

In conclusion, the Evaluator of this MTE states that the outputs and outcomes have been prepared and the execution, in general, is being developed by the UNDP/MMA Project team and involving the partners accredited by the selection process and was considered to be **Highly Satisfactory (6 pts).**

3.3 Project Outcomes

The Project outputs and outcomes of the Components 1 and 2, object of this MTE, have been constructed through preparatory activities fundamental to the efficiency and effectiveness of the results and which have promoted the participation of the partner institutions.

These actions, according to the Evaluator, are relevant because, to a certain extent, they are promoting training and knowledge assimilation to those involved and preparing material for the construction of the ODS Waste Management System and for the information dissemination about management actions and Disposal of the ODS residues.

The preparatory actions identified by the MTE are oriented to the main focus of this Project and also reflect the fulfillment of Brazil's commitments and obligations in relation to ODS elimination and ozone layer protection.

3.3.1 Partial Outcomes and General Activities

The Project outputs and outcomes of Components 1 and 2 required, as already mentioned, preparatory and other execution activities as indicated in Table 6, Outcomes/Activities, corresponding to the required outputs, goals and inputs.

This section evaluates the activities involved in the preparation of outputs, by year of execution. The main objective of these preparation activities for the achievement of the Project final objective and closing the circle for ODS elimination has been achieved by the effective and participative action of the UNDP/MMA team with those involved in Project execution.

The information contained in this MTE Report is based on the implementation reports provided by the UNDP/MMA team as well as annual reports of work plans and financial performance. The MTE also used data and information from projects already executed by the PNC and by PBH and its various technical reports and other information obtained from interviews conducted during the MTE process.

The outputs and partial outcomes of the Demonstration Project on "ODS Waste Management and Disposal" implementation were considered by the Evaluator to be **Satisfactory (5 pts)**, in relation to the objectives and past and future activities as presented in Table 6.

Table 6: Partial Outcomes Regarding Components 1 and 2 and Project Objectives and Activities

Objective: - Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.					
Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation. **Outcome of Component 2:** Incineration of ODS waste demonstrated.					
Output Description	**Indicator Description**	**Baseline**	**Output Targets/year**	**Preparatory Activities Developed**	**Partial Results in 2015-2016**
Output 1.1 - Extended ODS waste storage structure.	- Increase in total storage capacity to 20 metric tons.	- Limited storage capacity of 4.4 metric tons.	**(2015-2016)** - Expansion of total storage capacity from 4.4 to 20 metric tons of ODS waste in 4 CRA (Regeneration and Storage Centers).	**(2016)** • Formulation of term of reference and strengthening of the Integrated System of Management of ODSs: a) Prepare a Call for Expression of Interest (MI) for the selection of CRAs; b) Publish Notice of MI 32016/2016 for CRAs; c) Prepare a study to verify the requirements required to apply the AHRI 700 standard by CRAs (verification of requirements, form of implementation and costs associated with processes);	**(2016)** a) Call for Expressions of Interest prepared. b) Call published and sent to CRAs; c) Study about requirements of application of Norm AHRI700 by CRAS, checking pre-requisites, form of implementation and Project costs, prepared;

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
				d) Consult the CRQ/CFQ regarding the technical responsibility of the laboratories of the CRAs for the chemical analysis of the ODSs (issuance of a technical report); e) Update inventory of stored ODSs for final destination (CRAs and UDRs). Confirmation of quantity / weight. f) Payment of Temporary Storage services: Payment of Temporary (retroactive) Storage of ODSs in Bandeirantes and Capital companies; g) Carry out analysis of the manifestations received in the scope of MI 32016/2016: activity carried out; h) Disclose results of MI 32016/2016 for CRAs qualification: CRAs	d) Consultation of the CRQ/CFQ regarding the technical responsibility of the CRAs laboratories for the chemical analysis of ODS for the issuance of technical reports, carried out. e) Inventory of ODSs stored in CRAs and UDRs for Disposal, carried out. f) Part of the activities carried out, part in progress; g) Analysis performed, activity performed and result obtained; h) Results disclosed, activity performed and result obtained

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
				selected - Recigases, CRN, Frigelar, Ecosuporte: activity performed i) Acquisition of equipment j) Check the appropriate cylinder type and quantity for the CRAs in relation to the storage, transportation and final destination process; a) Consult national and international suppliers with verification of brands, capacities and budget) for the acquisition of materials and equipment for the handling of ODSs and for laboratories (cylinders, identifiers, chromatographs, equipment and laboratory materials) and definition of technical criteria; b) Publish call for proposals (by lot) to acquire equipment for CRAs. **(2017)**	• Acquisition of equipment a) Verification carried out, activity performed and result obtained; b) Consultation carried out, activity performed and result obtained; - Call for proposals for acquiring equipment for CRAs published. **(2017)**

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
				• Formulation of terms of reference and strengthening of the Integrated System of Management of ODSs: a) Hire Temporary Storage service in four (4) CRAs: CRN, Frigelar, Ecosuporte and Recigases; b) Map environmental agencies to involve them as part of waste management; • Acquisition of equipment a) Enable the adaptation of the laboratories of the CRAs through the following activities: i) prepare and approve the budget of equipment and laboratory materials; ii) prepare TOR with technical specification for the bidding process; iii) carry out purchasing process: opening of CR for the purchase of laboratory	• Formulation of term of reference and strengthening of the Integrated System of Management of ODSs: a) Contracted service, activity in progress considering that the payments are quarterly; b) Mapping to be carried out; Activity in planning. • Acquisition of equipment a) Part of the activities executed and part in execution;

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
				material; Publication of TOR; Carry out a technical evaluation of the proposals; Approve and finalize the purchase process; b) Monitor installation of equipment, calibration, testing, etc.; c) Perform training for the use of laboratory equipment and materials. • Increased capacity of selected CRAs: a) Prepare TOR with technical specifications for bidding; b) Carry out the purchase process: i) prepare and publish TOR; ii) technical evaluation of proposals; iii) homologation and finalization of the purchase process. Waiting for delivery of the cylinders in the CRAs.	b) Activity in progress; c) Activity in planning. • Increased capacity of selected CRAs: a) TOR elaborated, activity performed, result obtained; b) Activities performed, activity in progress - awaiting delivery of the cylinders.

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
Output 1.2 Technical material for the ODS waste management produced.	- Technical information for ODS waste management provided.	- Lack of technical reference material for the sector.	(2015-2016) 01 Technical material, containing: - information and technical guidance on the handling of ODS waste inventory, including collection, storage and transport using technical standards; - guidelines on appropriate models for stock control; - characterization of ODS residues (gas chromatography and labeling); - classification of ODS (hazardous waste class) and types of treatment; - licensing procedures; - associated costs; - certification of final destination and issuance of documentation (including for transportation); - national and international legislation;	**(2016)** • Formulation of terms of reference and Production and revision of technical material: a) Prepare teaching materials for the Training Plan (including inventory management, collection, handling, identification, storage and final destination) and including presentation, training booklet and booklet for the consumer (with technical information, administrative practices and legal regulations). • Disseminate and make available on digital media for free access by the interested public: a) To elaborate content on the project for availability in the page of the	• Formulation of terms of reference and Production and revision of technical material a) part of the activity elaborated, part of the activity in preparation. • Disseminate and make available on digital media for free access by the interested public a) Content on the project to be made available on the page of the Protocol

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
			- National Solid Waste Policy (shared responsibility for the life cycle of products containing ODSs). **(2017)** **Increased Capacity of CRAs** - Elaborate TOR with technical specification for bidding: a) Open RC for laboratory purchases; b) Publish TOR; c) Technical evaluation of proposals Homologation. - Carry out the purchase process: a) finalization of the purchase process.	Protocol of Montreal in Brazil (http://www.protocolodemontreal.org.br/site/pbh/projeto-generation-and-destinacao-final-de-sdos/sobre- the project). **(2017)** • Dissemination of information and training a) Prepare a new project folder; b) Prepare training material - booklet, power point presentation after the qualification of the incinerators; c) Prepare primer on Waste Management of ODS; d) Prepare an invitation to institutions and bodies for training; e) Perform training.	of Montreal in Brazil elaborated, activity carried out, obtained result. **(2017)** • Dissemination of information and training a) Activity in planning; b) Activity in planning; c) Activity in planning; d) Activity in planning; e) Activity in planning.

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
				• Training/Materials/Waste Managers, CRAs and UDRs a) Conduct research of interest with waste managers on the training: activity performed. b) Prepare training material (handout, power point); c) Prepare invitation to companies for a training event; d) Perform training. • Updating of Sector Norms/ Regulations a) Prepare a Technical Standard on classification of gaseous wastes. • Disclosure of information a) Develop a campaign to encourage the adequate management of ODSs; Materials, folder to the end of the chain; Involvement of maintenance	• Training/Materials/Waste Managers, CRAs and UDRs a) Research to carry out, activity carried out, result obtained; b) Activity in planning; c) Activity in planning; d) Planning activities. • Updating of Sector Norms/ Regulations a) Activity in planning. • Disclosure of information a) Activity in planning,

Objective: - Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.					
Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation. **Outcome of Component 2:** Incineration of ODS waste demonstrated.					
Output Description	**Indicator Description**	**Baseline**	**Output Targets/year**	**Preparatory Activities Developed**	**Partial Results in 2015-2016**
				companies/consumers; Information - Magazines/Newspapers/TV. b) Continuously update the BRA /14/G72 Project Website.	b) Activity in progress (continued).
Output 1.3 Technical training events for the ODS waste management carried out.	- Sector for the adequate ODS waste management trained.	- Need for training in the proper ODS waste management.	**(2015-2016-2017)** 1 technical training event for CRAs, using the material produced in Output 1.2; 1 technical training event for UDRs and private companies, covering topics of the material produced in Output 1.2.	**(2016)** • Dissemination of information and training a) Participate in training relevant to the project: "Procedures for the management of refrigerants, focusing on the protection of the ozone layer" for technicians and refrigerators - SESI/SENAI. b) Prepare Workshop (URDs and CRAs): material on responsible use	**(2016)** • Dissemination of information and training a) Activity performed;

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
				of refrigerant gases from collection, regeneration or recycling, safe storage, Disposal and combating illicit trade, including recording the workshop, scenarios, as data for the construction of the Integrated System of Waste Management of ODS: in the phase of conclusion of planning. c) Disseminate information on CRAs and UDRs and awareness of environmental issues, which impact the entire chain. Strengthening of the work and role of Plants in receiving, regenerating, recycling and final destination of waste gases (all units). Information available on the Montreal Protocol website in Brazil (http://www.protocolodemontreal.org.br/site/pbh/project-management-and-destination-of-sdos/about-	b) Activity in the phase of conclusion of the planning; c) Disclosure of information, activity performed and result obtained.

Objective: - Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.					
Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation. **Outcome of Component 2:** Incineration of ODS waste demonstrated.					
Output Description	**Indicator Description**	**Baseline**	**Output Targets/year**	**Preparatory Activities Developed**	**Partial Results in 2015-2016**
				project). Activity performed, result obtained. **(2017)** • Dissemination of information and training a) Prepare Workshops (URDs and CRAs): material on the responsible use of refrigerant gases from collection, regeneration or recycling, safe storage, disposal and combating illicit trade, including recording the workshop, taking advantage of information and scenarios, as data for the construction of the Integrated System of Waste Management for ODS.	**(2017)** • Dissemination of information and training a) Activity in planning;
Output 1.4			**(2015-2016-2017)**	**(2017)**	**(2017)**

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
Technical assistance for the operation of the Integrated ODS Waste Management System performed.	- ODS waste management system running on CRAs.	- Absence of an appropriate ODS waste management model.	Integrated ODS Waste Management System fully established, trained and functioning.	• Consolidation of the Integrated Waste Management System for ODSs a) Carry out the 1,000-pound and 100-pound cylinders, equipment and operational tools for the CRAs (Capacity Enhancement) - ITB JOF Procurement Process 0042-30621 / 2017; b) Bid for the purchase of equipment, materials and laboratory reagents for CRAs - Procurement Process JOF-0230-31098 / 2017; c) Contract services of the CRAs for Temporary Storage of SDOs - quarterly payment, through an approved report demonstrating the provision of services; d) Prepare instrument for transfer of ownership of the equipment for the CRAs (operation and laboratory) - MoU or Term of Transfer of assets;	• Consolidation of the Integrated Waste Management System for ODSs a) Activity in progress; b) Activity in progress; c) Activity in progress; d) Activity in progress;

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
				e) Deliver laboratory equipment, materials and reagents to the CRAs - Procurement Process JOF-0230-31098/2017; f) Install equipment and carry out training - Laboratories CRAs; g) Contract services of the CRAs for Transfer of SDOs to standard cylinders and cleaning of old tanks and cylinders; h) Conduct training and training for CRAs, UDRs, waste managers and environmental agencies (as per the licensed incinerator and approved standards).	e) Activity in progress; f) Activity in planning; g) Activity in planning; h) Activity in planning.

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
Output 2.1 Incineration of ODS waste carried out.	- Establishment of an incineration plant.	- Absence of an incineration plant for ODS waste in the country.	**(2016)** 120 tons of ODS waste incinerated.	**(2017)** • Qualification of Incinerators a) Prepare a Call for Expression of Interest (MI) for the selection of the incinerator; b) Publish Notice of MI 30431/2017 to select the incinerators; c) Carry out analysis of the manifestations received in response to MI 30431/2017; d) Disclose the result of MI 30431/2017. • Incinerator suitability a) Hold technical meetings to define the scope of adjustments, definition of work schedule; b) Define mechanisms of transfer of resources to implement the adjustments in the incinerator;	01 Perito Internacional 01 Perito Nacional 01 Consultor especialista nacional 01 Auditoria Técnica Contratação de pessoa jurídica Aquisição de equipamentos	**(2017)** • Qualification of Incinerators a) Call for Expression of Interest (MI) prepared, activity performed, result obtained; b) Announcement of published MI, activity performed, result obtained; c) Analysis performed, activity performed, result obtained; d) Results disclosed, activity performed, result obtained. • Incinerator suitability a) Technical meetings held, activity in progress; b) Activity carried out;

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
				c) Perform Service Contract procedures: i) Preparation of invitation letter - CC; ii) Send letter of invitation (request UCC); iii) Forecast response to CC; iv) Preparation and submission to the CAP; v) Contract preparation (request UCC); vi) Signature; d) Monitor the installation of equipment and tests in the incinerator. e) Follow procedures for licensing the installation of incinerator adaptation. • Burn Test a) Carry out price quotation in the laboratory to perform sampling and analysis: verify parameters with the incinerator; hire laboratory for sampling and analysis; verify which	c) Activity in progress; d) Activity in planning. e) Activity in planning. • Burn Test a) Activity in progress;

Objective:
- Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.

Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation.
Outcome of Component 2: Incineration of ODS waste demonstrated.

Output Description	Indicator Description	Baseline	Output Targets/year	Preparatory Activities Developed	Partial Results in 2015-2016
				contracting instrument will be used and who will be responsible; b) Schedule burning test with the parties involved (incinerators, laboratory, environmental agency); c) Define sample and preparation of the shipment to the incinerator (or incinerators): check with the CRAs the samples for the tests; d) Perform burn test; e) Obtain report with result of the burn test; f) Follow procedure for Operation Licensing with the new activity in the incinerator.	b) Activity in planning; c) Activity in planning; d) Activity in planning; e) Activity in planning; f) Activity in planning g) Activity in planning;

Objective: - Monitor the ODS source collected and maintained by the selected CRAs, strengthening the ability to receive, separate, transfer and store temporarily with the use of appropriate equipment. The actions aimed at this objective should contribute to the efficient establishment of the logistical and transportation process, avoiding risks of release or loss of ODS to the atmosphere and seeking to finalize ODS waste disposal.					
Outcome of Component 1: Integrated ODS Waste Management System established, including technical assistance for collection, training, storage, consolidation and transportation. **Outcome of Component 2:** Incineration of ODS waste demonstrated.					
Output Description	**Indicator Description**	**Baseline**	**Output Targets/year**	**Preparatory Activities Developed**	**Partial Results in 2015-2016**
				g) Send ODS waste to the incinerator; h) Guide the CRAs on the request for environmental authorization (CADRI); i) Define the logistics for transporting the ODSs of the CRAs to the incinerator. j) Contract incineration of ODS and monitor effective destruction of the ODS stocks currently identified in the Country through the Certificate of Waste Disposal.	h) Activity in planning. i) Activity in planning. j) Activity in planning.

Source: Project Document and Activities Report, 2015-2016.

Because Component 4 and its outputs are not part of the MTE object, the Evaluator has chosen to place the outputs of this component as a footnote. As these outputs and their scope will form part of the Project BRA/14/G72 substantive review, which is under way and is considered of great importance for the implementation of the activities towards the objectives and the final outcomes. It has become relevant to make it explicit in this document.

Product 4.1: 1st Project Substantive Review: Schedule TPR; Prepare 1st draft of the document (substantive review + progress report); Document Review (substantive review + progress report); Prepare second draft of the document (substantive review + progress report); second revision of the document (substantive revision + progress report); Submission of the final document to UNDP Program Coordinator; Submission of the final document to ABC; Hold TPR meeting.
- Project Budgetary Review: a) Budget Planning Review; B) Request ASL according to the AWP.

3.3.2 Relevance

At Mid-Term Evaluation, the BRA/14/G72 Demonstration Project for ODS Waste Management and Disposal is of great relevance in order to definitively eliminate ODS wastes, concluding the successful implementation of the National CFC Disposal Plan and the achievement of the ultimate goal of eliminating ODSs.

The relevance of Project BRA/14/G72 is based on the achievement of the final conclusion of the actions of the National Plan for CFC Elimination, which was approved by the Executive Committee of the Multilateral Fund for the implementation of the Montreal Protocol, finalizing the execution of its projects with efficiency and showing relevance to the elimination of ozone-depleting gases. It is important to note that the risk of ozone depletion and the solution through restrictive protocols, such as Montreal, were seen as examples of success by prioritizing environmental over economic issues.

PNC execution involved the establishment of norms and regulations by the Brazilian Government and the change of industrial processes in the country, being fundamental requirements for the objectives of ODS annual reduction to be reached. The investments provided by the MLF resources were important inputs for the results of the activities carried out to meet the criteria of efficiency and sustainability in the ozone layer preservation.

Industrial restructuring and technological adaptation required high costs and time to materialize results. Furthermore, a qualitatively well-structured training program can provide relevant information for the ODS elimination. All these facts are fundamental for the process of awareness-raising related to the importance of ozone layer preservation.

Partnerships were important for the efficient PNC projects performance. These include the participatory establishment of Regeneration and Storage Centers (CRAs) and Decentralized Recycling Units (UDRs). It is also worth mentioning the experience gained in ODS reduction and elimination which was the result of the convergence between the financing granted by the FML and the effective establishment of regulations and national standards to guide the private sector in CFC elimination.

However, a stock of ODS residues remained stored and was obtained by collecting ODS in the amount of 422,444 kg of CFC (CFC12, CFC11) according to the inventory of March of 2016. This amount contains pure and contaminated substances and is mainly stored in the CRAs. Additional quantities were found in the UDRs, also considering the amount of 734,400 kg of fluorinated substances seized by IBAMA. To achieve the ultimate goal of eliminating this liability, the structure built by the PNC projects was of paramount importance and characterizes the relevance of the objective established by Project BRA/14/G72.

Other policies have also been grounds for the ODS waste disposal, such as the National Solid Waste Policy (PNRS), Law no. 12.305/2010, article 3, XVI, which explains: the gases contained in containers are also considered as solid waste, further evidence of the relevance of implementation of Project BRA/14/G72.

In this sense, the FML recognized the relevance of the actions proposed by the Project and granted financial resources to fulfill the commitments assumed by Brazil under the

Montreal Protocol. UNDP/MMA intervention through the implementation of the activities proposed by Project BRA/14/G72 can therefore be considered as: **Highly Relevant (2 pts).**

3.3.3 Effectiveness and Efficiency

The MTE report shows that the preparatory activities towards the outputs and outcomes of Components 1 and 2 have been carried out effectively and efficiently.

According to the MTE, regarding the effectiveness and efficiency of the Project implementation, it is important to highlight the actions developed to update data on CRAs and UDRs and the subsequent selection of plants which would be part of the Project. The data and information collected will be part of the Integrated ODS Waste Management System, which is currently being planned. The tools of the System will bring security and transparency to the data and will contribute significantly to decision making on the formulation and implementation of other projects.

The process of selecting the institutions participating in the process of ODS storage, transportation and final destination has contributed to the effective and efficacious actions in pursuit of the proposed objectives. This process also included survey activities, equipment inventory and laboratory materials of the selected partners, aiming at the purchase and donation of this material for the proper functioning and precision in ODS analysis. The monitoring and effective actions for proper functioning of laboratories in the selected CRAs, as well as actions to adapt the incinerator of the selected company, Essencis Soluções Ambientais, have been carried out with effectiveness and have been highly efficient.

The effectiveness and efficiency of the Project were considered **Satisfactory (5 pts).**

3.3.4 Country Ownership

As already mentioned, Brazil acceded to the 1985 Vienna Convention on Ozone Layer Protection and has been a Party to the Montreal Protocol on Substances that Deplete the Ozone Layer since 1990. The country has formally acceded to these international treaties by means of Legislative Decree No. 91 of the Federal Senate, dated December 15, 1989, which was ratified by President Fernando Collor through Federal Decree 99.280, dated June 6, 1990.

According to the Montreal Protocol, developed countries that have historically consumed more ODS should finance their eradication in developing countries. Thus, as already mentioned, the Multilateral Fund was created to fund activities aimed at protecting the ozone layer. The Country was classified as an operational party under Paragraph-1, Article 5 of the Montreal Protocol, qualified for a special program to reduce ODS and to receive technical-financial assistance.

The country has demonstrated ownership of the ozone layer protection issue. In 1988, the Ministry of Health initiated actions to control ODS, regulating information on CFC-free aerosol packaging labels, based on the Ordinance of October 1, 1988. In addition, the Federal Government created the Ozone Working Group (GTO) via Inter-Ministerial

Ordinance 929 of October 4, 1991, to facilitate the Protocol implementation and, by Ordinance No. 4 of January 11, 1993, obliged producers, importers, exporters and users of substances under Annex A, B and C of the Montreal Protocol to register with IBAMA.

The appropriation of the ozone layer protection issue continued with the Brazilian Program for the Elimination of the Production and Consumption of Substances that Deplete the Ozone Layer (PBCO) launched in September of 1994, focusing on industrial conversion activities and the analysis of all producer and user segments. Based on this experience, Resolution 13/1995 of the National Environmental Council (CONAMA) defined priorities for Brazil's participation in the conversion of industrial technology for CFC elimination.

The PNC, implemented in 2002, was aimed at eliminating the use of CFCs in all sectors by January 2010 and its implementation reflected the appropriation of the issue of ozone layer protection. Based on Law 10.165 of 2000, CONAMA Resolution 267/2000 and IBAMA Normative Instruction 37/2004, the Brazilian government has regulated and controlled all production, commercialization and consumption of substances included in the Montreal Protocol.

In addition, PBH has established control of HCFC production and consumption. The Normative Instruction (IN IBAMA 207) of November 19, 2011, regulated HCFC import restrictions.

UNDP/MMA technical cooperation has assisted implementation of projects that strengthen ownership of the issues covered by the Montreal Protocol, and the Demonstration Project for the ODS Waste Management and Disposal was a further step towards consolidating Brazil’s ownership of issues of ozone layer protection.

3.3.5 Mainstreaming

According to the MTE, Project BRA/14/G72’s key and central issue is ODS waste disposal through incineration. To achieve this objective, Brazil has presented standards and regulations that comprise a legal system for the management of hazardous waste, a base of professionals trained in waste management and investments in adequate facilities for collection, handling, processing and final destination of hazardous waste. Concerns about the environment and its proper treatment are part of Brazil’s commitments to international agreements, and specifically to the Montreal Protocol.

The Project aims to contribute in a relevant way to Brazilian policies of reducing emissions, reducing vulnerabilities and ways to adapt to climate change. Above all, the Project seeks to comply with and follow international standards, as set forth in the PRODOC.

3.3.6 Sustainability

Sustainability can be defined as the probability of continuous benefits after project completion.

Project BRA/14/G72 has provided financial, institutional and governance conditions to continue work during and after its implementation. Considering the period after the implementation of BRA/14/G72, the MTE foresees the continuity of actions through the

proper functioning of the Integrated System of ODS Waste Management. It will collect data and information that in various ways should lead to Project sustainability.

According to the MTE, agreements among government authorities, manufacturers, importers and other entrepreneurs in the sector may be established in order to maintain updated equipment and maintenance and systematically acquire knowledge, providing conditions of sustainability of the actions carried out by the Project.

MTE evaluated Project BRA/14/G72 sustainability considering the risks that could affect the continuation of its results. The main risk raised is the loss of support from the Brazilian Government to the commitments made under the Montreal Protocol, such as delays in the establishment of norms and regulations and lack of personnel and resources for the systematic monitoring of ODS waste disposal.

Sustainability Classification

The MTE has identified that the Brazilian Government is strongly committed to fulfilling its obligations under international agreements on issues related to maintaining a healthy environment while preserving the ozone layer at the national and global levels. The outputs and outcomes of Components 1 and 2 of Project BRA/14/G72 have involved actions directed to total elimination of ODS waste. The sustainability of the results is clearly demonstrated and the evaluation of the sustainability of the Project actions is therefore **Probable (4 pts).**

3.3.7 Impact

The BRA/14/G72 Project has provided information and knowledge about possible impacts on the environment if the ODS waste is not properly incinerated. For this reason, the Integrated System of ODS Waste Management will provide conditions to control the problem and the legal system established and the standards to be elaborated will have an impact on the total elimination of ODS stocks.

Therefore, MTE states that the Project implementation and its actions have generated data and information that reflect the impact of activities on waste management issues of substances that lead to social and environmental vulnerabilities at local, national and global levels. The impact of the Project has been considered positive if properly executed, as it has been, and with little chance of being negative if implementation does not correspond to national and international standards. The impact, therefore, is **Significant (5 pts).**

3.3.8 Evaluation Rating of the Partial Outcomes

The UNDP evaluation policy stipulates that ratings should be assigned to the relevance, effectiveness, efficiency and quality of the activities implemented by the Project and the monitoring and evaluation system. Table 7 lists all ratings provided by the MTE Evaluator, based on the considerations already mentioned.

Table 7: Rating for Project Design and Outcome Implementation

Evaluation Ratings:			
1. Monitoring and Evaluation	**Rating**	**2. IA& EA Execution**	**Rating**
M&E design at entry	5 (S)	Quality of UNDP Implementation	6 (HS)
M&E Implementation Plan	5 (S)	Quality of Execution – Executing Agency	6 (HS)
Overall quality of M&E	5 (S)	Overall quality of Implementation/Execution	6 (HS)
3. Assessment of Outcomes	**Rating**	**4. Sustainability**	**Rating**
Relevance	2 (R)	Financial resources	4 (L)
Effectiveness	5 (S)	Social-political	4 (L)
Efficiency	5 (S)	Institutional framework and governance:	4 (L)
Overall Project Outcome Rating	5 (S)	Environmental	4 (L)
		Overall likelihood of sustainability:	4 (L)

According to the Evaluator, the Project rating as a whole is **Satisfactory (5 pts)**, which means that the Project has minor shortcomings and delays in implementation, but they are recoverable and justified by the delay in the execution team formation and the complexity of the actions needed for reaching the Project outcomes.

4 Implementation Considerations, Conclusions and Recommendations

According to the Evaluator, the implementation of Demonstration Project for ODS Waste Management and Disposal has been satisfactory. The factors that will lead to success of the Project's results and dissemination of good practices in the future include the development of activities considered by the MTE to be fundamental for achievement of the Project's final objective, namely incineration of ODS waste currently identified in the country and inventoried by the Project.

These activities include those that led to the selection of ODS Regeneration and Storage Centers (CRAs) to become partners in Project implementation, other research initiatives and contacts established to select the company capable of performing ODS waste incineration, with evaluation of its equipment and material for transportation of waste to the incinerator as well as the search for and selection of specialists, institutional arrangements and planning and programming of training programs about sector issues.

All these actions taken as preparatory to the Project outputs and achievement of the final result, namely incineration of ODS and other substances, were considered by the MTE as key points for the success in Project implementation. These partial results are due to the composition of both the execution team and the Project coordination unit. In addition, the involvement of experts contracted by the Project and especially its work to evaluate the CRA laboratories for efficient analysis of ODS residues and alternative substances have been key to the search for efficient results. The results of these evaluations were important inputs for the decision to purchase equipment and materials to provide adequate laboratory environments for the selected companies. In this way, the activities that are explained in this MTE document are essential for reaching outputs and outcomes of the Project components.

The tasks involving partnerships established with UNDP/MMA to build solid foundations for ODS waste storage, transportation and consolidation and the tasks of research and ODS destruction have required work by the execution team including site visits, meetings, evaluations and contacts with specialists to develop means to ensure that the Project achieves its purpose of final disposal of ODS.

According to the MTE, all these complex tasks involving partnerships with diverse capabilities have required and will require increased control work, since the data collected will need to be more precise in order to guide incineration activities and ODS management and establish norms to be reformulated or defined by the control agencies. Thus, data collection will become increasingly complex, requiring more time and personnel to control and coordinate with databases and with the information that should be controlled by IBAMA's Federal Technical Registry of Potentially Polluting Activities and/or Users of Environmental Resources (CTF/APP).

Regarding the actions for partner institution selection, the Regeneration and Storage Centers complied with the requirements set forth in the Call for Expressions of Interest (MI) and are committed to storage of the ODS currently identified in the country, carrying out activities that guarantee the proper custody and storage of the substances, handling various types of laboratory equipment provided within the scope of the Project. Identification of insufficient technical knowledge among those who work with these fluids as regards both handling these substances and appropriate procedures requires additional attention from the Project's training programs and wide dissemination of information.

Regarding the analysis of the Project activities executed and now under way, the MTE verified that the actions for selection of the partners for Project implementation required efficient and time-consuming work by the execution team. This is because many of the CRAs surveyed no longer had the equipment donated by the National Plan for CFC Elimination or else their equipment was already obsolete. The same is true for the contacts established with the Decentralized Recycling Units (UDRs).

Thus, in sum, the selected CRAs are located mainly in the states of São Paulo, Rio de Janeiro, Pernambuco and Rio Grande do Sul. Their work will undoubtedly open the market for management of ODS as well as refrigerant fluids. The companies are:

- **Recigases,** a company responsible for the regeneration of refrigerants in the state of Rio de Janeiro;
- **Frigelar**, company located in several cities and states around the country;
- **Centro de Regeneração e Reciclagem do Nordeste (CRN)**, headquartered in Recife, state of Pernambuco; and
- **Empresa MP2 Gerenciamento e Comércio de Resíduos - EcoSuporte Soluções em Gestão Ambiental,** in the city of Porto Alegre, state of Rio Grande do Sul.

These partners established for Project implementation are receiving some equipment, mainly for laboratory adequacy and others for ODS waste storage, such as cylinders suitable for this purpose. In addition, the development of these activities involves the transfer of knowledge that will be part of training programs and will contribute to development of a "Brazilian Model of ODS Waste Management and Final Destination," as is the intention of the UNDP/MMA team.

The selection of the company capable of carrying out ODS waste incineration was done by sending out the call for Expressions of Interest and receiving responses. The responses were carefully analyzed so as to select an institution that could create national capacity for the destruction of ODS residues and halogenated substances that no longer have commercial value and are unfit for use. The substances to be incinerated are basically CFCs (chlorofluorocarbons), HCFCs and other ozone-depleting substances or alternatives with high potential for global warming (HFCs, for example).

The Expression of Interest foresaw appropriate heat treatment facilities for destruction that in fact correspond to the stage of establishment of an ODS Waste Management System, as foreseen in Project BRA/14/G72 as a Result of Component 1. This appropriateness involves:

a) adaptation of a line for processing of gaseous substances in the company's furnace and all necessary equipment and materials;
b) tests of burning the substances and all costs involved in the burning operation;
c) environmental licensing; and
d) ODS incineration, in accordance with procedures and standards established by the Montreal Protocol.

The MTE verified that an Evaluation Committee of the Expression of Interest No. 30431/2017 was created and composed by the Project team and UNDP representatives of

the administrative sector. The company selected met the eligibility criteria approved in Decision 60/44 of the Executive Committee of the Multilateral Fund (ExCom), in accordance with Article 5 of the Montreal Protocol. Some documents were also required for analysis and approval of the selected company and criteria for selection were defined and applied.

The enterprise selected, Essencis Soluções Ambientais presented the required documentation, which included a license for thermal treatment activity, according to requirements for environmental licensing and other laws and regulations, such as:

1. CONAMA 316/2002 - Procedures and criteria for the operation of waste heat treatment system;
2. NBR 11175/1990 - Incineration of hazardous solid waste - Performance standards.

In addition, the Essencis company had a good technical evaluation, operating the heat treatment according to environmental licensing requirements and according to general criteria established and explained in the conclusion document about the selection process. Additional inquiries and procedures were responded to and met by the selected company.

Thus, as described in the completion report of this selection, after analyzing the information required to prove technical qualification, although it did not comply with some items that did not prevent it from being considered fit to act with Project BRA/14/G72, the Essencis company was selected to be a partner and receive the investments foreseen within the scope of this Project.

The Essencis Soluções Ambientais company has been established in the market since 2001 in the city of São Paulo, state of São Paulo, serving the entire country. It is committed to the guidelines of the National Solid Waste Policy (PNRS), making innovative technologies available to the industry. This company has a complete technology park for integrated solutions for the treatment of solid and liquid waste, and also has a laboratory equipped for analysis, monitoring and control of internal services and analysis of characteristics and classification of waste and effluents.

The MTE verified that a mission carried out by the UNDP/MMA Team collected further information about the company regarding the process of burning substances in a rotary kiln for solids and liquids, with a post-combustion chamber and an incinerator with licensed capacity of 800 kg/hour. According to the visit report consulted, the Company's facilities visited also include:

- atmospheric emission control equipment, with a post-combustion chamber that results in the gases oxidation;
- a Quencher, equipment for cooling gases to control dioxins and furans;
- two Cyclones for particulate abatement and bag filter;
- a Venturi washer for gas cleaning and pH correction, an Absorption Tower and a Gas Analyzer.

The Project’s technical team also observed the feeding system for solids and liquids as well as parameters and limits of furnace feed and atmospheric emissions. It was also certified that all of these items comply with CONAMA norm No. 316 and NBR 11175, according to the operating license.

All this care taken by the UNDP/MMA team is justified, since burning ODS and alternative substances cause emissions that need to be systematically controlled. Precaution involved a range of procedures that took significant time, but they lead to effective, efficient and sustainable results.

As is also explained in this MTE report, the contacts and the partnership established in an official letter of April 25, 2017, with the Environmental Sanitation Company of the State of São Paulo (CETESB) to support execution of activities of Project BRA/14/G72, are undoubtedly fundamental to the search for results with efficiency and effectiveness.

Thus, according to a mission report of the CETESB visit in April of 2017, a meeting on the need for adjustments in the incinerator of Essencis Soluções Ambientais also addressed issues of monitoring of atmospheric emissions and environmental licensing. This control must be carried out by CETESB, which has rules and procedures that are even stricter than those of the federal government and will accompany the incinerator burning tests.

At this meeting, according to the aforementioned visit report, after informing the Chlorine and Fluor feed limits of the incineration company's license, CETESB stated: *"We do not see any problem with substances or time for feeding, and if necessary, the feed rate can also be increased, as long as burning efficiency can be proved in the specific burning test."*

Also, in relation to ODS handling and storage, which is only authorized for solid waste, CETESB also stated explicitly in the aforementioned visit report: *"Essencis is not authorized to burn aerosols because they cause accidents when put into the furnace under pressure. But there is no problem for the company to handle and work with refrigeration fluid cylinders as long as professional staff is trained and fit for this activity."*

Regarding the necessary adaptations to be carried out at Essencis Soluções Ambientais, CETESB made clear that it would provide follow-up assistance for improvement and licensing, offering support from its staff, in addition to offering its facilities for use in training programs.

It is important to emphasize that, according to the Evaluator, all these contacts are highly relevant for the analysis of the ODS burning procedures, the final objective and central result of Project BRA/14/G72. According to consultations during the MTE, there is no incinerator that does not release some kind of pollutant into the atmosphere.

As already shown in this MTE report, the activities carried out by the Project have improved data and provided more depth, generating more precise knowledge in the area of ODS final destination to obtain more consistent actions and methodologies to help reduce uncertainties in the application of burning processes and in obtaining accurate data to be incorporated into the CTF/APP/IBAMA/MMA, as well as managing residues of substances that cause harm to the ozone layer.

As has been done so far, encouraging prevention, reuse and recycling may reduce the need for ODS Disposal, but it must be noted that there are still 100 tons of ODS waste to

be incinerated. The ODS waste that is stockpiled to be incinerated requires care that the Project implementation team is taking, as well as sufficient time.

According to MTE results, the delays that occurred in the Project execution schedule and the low level of physical-financial performance have justifications found in the explanation of implementation provided here about activities that require additional time in order for Project results to be reached.

Some recommendations that can be made by MTE are as follows:

- Extend the expiration date of the project for five (5) years in accordance with the proposed work schedule presented and approved by the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol at its 79th Meeting, held in July of 2017, in order to allow the activities in the execution and planning stages, including the effective destruction of the 100 tons of identified ODS waste, to be carried out;

- Support the CRAs to improve their laboratories. This improvement is necessary so that laboratories can adequately verify the degree of purity of fluids that have undergone regeneration processes. This is the only way for laboratories to certify regenerated fluids;

- Include in the training programs to be carried out within the scope of the Project emphasis on adequate handling, in terms of storage, transfer, transport and destruction of ODS;

- Review procedures and standards to include issues about data and information on ODS Waste Management, under development and to be developed in synergy with national programs on energy efficiency and sustainable management of solid waste and electrical and electronic equipment waste, as determined by the PRODOC;

- Conduct, in a participatory manner, the revision of existing national technical standards and others to be created in accordance with international parameters that require viewing and revision simultaneously with the preparatory activities already explained in this document. Industrial and professional associations and related institutions play an important role in this regard;

- Encourage discussions on specific issues raised during the execution of the activities of Project BRA/14/G72, based on workshops or meetings with the support of industrial associations and environmental agencies; and

- Carry out awareness-raising and training activities when possible. Although diffusion of technology occurs relatively quickly, changes in awareness and behavior of technicians in their work routines may take years.

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5.1 Terms of Reference

Termos de Referência

RC 30873

CONSULTOR NACIONAL IC PNUD *(IC Contractor)*

PROGRAMA DAS NAÇÕES UNIDAS PARA O DESENVOLVIMENTO

"Avaliação de Meio Termo do Projeto BRA/14/G72 - Gerenciamento e Destinação Final de Resíduos de SDOs"

1. Introdução

O objetivo do Projeto BRA/14/G72 é desenvolver um sistema de gerenciamento e destinação final ambientalmente adequada, eficiente e economicamente rentável de Sustâncias que Destroem a Camada de Ozônio (SDOs), mediante o estabelecimento de um Sistema de Gerenciamento de Resíduo de SDOs em âmbito nacional, com investimento do Fundo Multilateral para a Implementação do Protocolo de Montreal (FML).

O Protocolo de Montreal sobre Sustâncias que Destroem a Camada de Ozônio é um tratado internacional criado em 1987 para proteger a camada de ozônio por meio da eliminação da produção e consumo das SDOs. Em 2009, este acordo entrou para a história ao se tornar o primeiro tratado sobre meio ambiente a ser universalmente ratificado pelos 197 países (Partes).

O FML é o mecanismo financeiro criado para prover assistência técnica e financeira aos países em desenvolvimento (Partes que operam sob a égide do Artigo 5) para eliminar o consumo de SDOs de acordo com os cronogramas de eliminação.

Apesar das diversas iniciativas bem-sucedidas de eliminação do consumo de SDOs, em especial dos CFCs e, atualmente, dos HCFCs, há ainda um passivo que permanece presente como fluido frigorífico em equipamentos de refrigeração e ar-condicionado (RAC) ou como agente de expansão em espuma de poliuretano, e que pode acabar sendo liberado na atmosfera em algum momento da vida útil dos equipamentos, acarretando em danos à camada de ozônio. Países em desenvolvimento, incluindo o Brasil, possuem bancos remanescentes de SDOs com alto potencial de destruição do ozônio (PDO) (principalmente de CFCs), que constituem um passivo ambiental preocupante a ser administrado e eliminado.

Conforme Decisão MOP XX/7, os Estados Partes solicitaram ao Comitê Executivo do FML (ExCom) que considerasse apoio técnico e financeiro a projetos demonstrativos de gerenciamento e destinação final de SDOs

inservíveis nos países do Artigo 5. Em face do disposto, a Decisão ExCom 58/19 aprovou um conjunto de diretrizes para o financiamento de projetos demonstrativos visando o gerenciamento e destinação final ambientalmente adequada de resíduos de SDOs nos países em desenvolvimento.

Na 57ª reunião, o ExCom aprovou recursos para a preparação de um projeto piloto demonstrativo de gerenciamento e destinação final de resíduos de SDOs para o Brasil (Projeto BRA/DES/57/PRP/288). A proposta do projeto foi elaborada pelo Programa das Nações Unidas para o Desenvolvimento (PNUD), sob a coordenação do Ministério do Meio Ambiente, e submetida para aprovação do ExCom na 72ª reunião, realizada em maio de 2014. O projeto, posteriormente nomeado BRA/14/G72, foi aprovado no valor de USD 1.490.600, considerando o estoque atual de resíduos de SDOs e o aperfeiçoamento de instalações de incineração de alta temperatura, seguindo os padrões internacionais para esse tipo de atividade.

O Projeto BRA/14/G72 abarca todas as etapas do gerenciamento de resíduos, como regeneração, armazenamento de SDOs contaminadas, logística e transporte, bem como a qualificação e adequação de incineradores brasileiros para a destruição segura das SDOs inservíveis. Espera-se que ao final do projeto, seja estabelecido um modelo de gerenciamento de resíduos de SDOs para que os setores públicos, privados e consumidores finais possam devidamente se orientar e fazer com que esta atividade se torne uma prática regulamentada e frequente.

2. Objetivos da Consultoria

Realizar avaliação de meio termo do Projeto BRA/14/G72 – Projeto Demonstrativo para o Gerenciamento e Destinação Final de Resíduos de SDOs.

Avaliar os Resultados do PRODOC abaixo listadas, observar o cumprimento dos objetivos do projeto, necessidades de alteração e/ou inclusão de novas atividades, adequação dos prazos para a implementação e recomendações de melhorias:

- Resultado do Componente 1: Sistema Integrado de Gerenciamento de Resíduos de SDOs estabelecido, contemplando assistência técnica para o recolhimento, capacitação, armazenamento, consolidação e transporte;
- Resultado do Componente 2: Incineração de resíduos de SDOs demonstrada.

O PRODOC na íntegra será disponibilizado (via e-mail) para todos os candidatos, para a devida consulta.

A Avaliação de Meio Termo se realizará segundo as pautas, normas e procedimentos estabelecidos pelo PNUD, segundo estabelecido no "*Handbook on Planning, Monitoring and Evaluating For Development Results*" (a ser enviado via e-mail para os candidatos).

Os objetivos da avaliação é analisar os sucessos alcançados e dificuldades enfrentadas pelo projeto, assim como extrair lições aprendidas que possam melhorar a sustentabilidade de benefícios deste projeto e ajudar a melhorar de maneira geral o cronograma de execução pelo PNUD.

3. Escopo da Avaliação

Avaliação da implementação dos **resultados do Projeto no período de 08 de Junho de 2015 até a data atual**, que correspondeu à primeira fase do Projeto, com a execução dos Resultados 1 e 2.

O consultor poderá avaliar, mas não se limitando a:

- Visitas técnicas realizadas para assistência técnica do projeto;
- Planos de Trabalho;
- Manifestações de interesse;

- Instrumentos de contratação com as empresas participantes do projeto;
- Requisições de compra de materiais, equipamentos e ferramentas;
- Solicitações de contratação de serviços correspondentes ao gerenciamento ambiental integrado;
- Relatórios de consultoria contratada para suporte ao projeto;
- Posição dos beneficiários do projeto (CRAs e Incineradores).

O Consultor também poderá realizar entrevistas com as pessoas e entidades envolvidas no projeto:

- Analista de programa;
- Gerente de projeto;
- Assessora Técnica;
- Consultor Internacional;
- Gerência de Proteção da Camada de Ozônio do Ministério do Meio Ambiente (GPCO/MMA);
- IBAMA;
- Associação Brasileira de Refrigeração, Ar condicionado, Ventilação e Aquecimento (ABRAVA);
- Centrais de Regeneração e Armazenamento (CRAs);
- Incineradores.

4. Produtos esperados da Avaliação

Produto I – Plano de Trabalho:

O Plano de Trabalho deve conter:

- Caracterização do Plano de Trabalho;
- Detalhamento do objeto e do escopo de trabalho;
- Metodologia de desenvolvimento dos trabalhos e de relacionamento com a equipe do Projeto e do PNUD;
- Definição das questões a serem analisadas;
- Definição das fontes de coleta de dados (mapeamento documental, identificação e seleção dos *stakeholders* relevantes/prioritários);
- Desenvolvimento dos instrumentos de coleta de dados (roteiros para realização de entrevistas);
- Cronograma de Trabalho.

Produto II – Relatório de Coleta e Análise de Dados, contendo:

- Descrição do processo de coleta de dados e de entrevistas, explicitando eventuais dificuldades para o desenvolvimento dos trabalhos; e
- Análise do material coletado.

Produto III – Relatório de Avaliação de Meio-Termo do Projeto:

O Relatório de Avaliação deve conter:

- Sumário Executivo (descrição sucinta do Projeto, descrição sucinta dos propósitos da avaliação, das questões-chave analisadas e dos resultados obtidos);
- Introdução (propósito detalhado da avaliação e questões-chave que foram analisadas, metodologia e estrutura do relatório de avaliação);
- Avaliação da implementação dos resultados do Projeto, incluindo análise físico-financeira da execução;
- Descrição das lições aprendidas (indicação de lições passíveis de serem aplicadas genericamente e melhores e piores práticas de formulação, implementação, monitoramento e avaliação de projetos similares);
- Anexos (entrevistas, questionários, etc.).

Este Relatório deverá ser redigido em Português e em Inglês.

5. Sugestão de Metodologia ou Abordagem de Avaliação

A avaliação deve proporcionar informação baseada em evidência que seja comprovada. Espera-se que o avaliador siga um enfoque participativo e consultivo que assegure estreita participação com o Ministério do Meio Ambiente, o Escritório do PNUD, a equipe do projeto (Gerente de Projeto, Assessora Técnica) e interessados chave. Espera-se que o avaliador realize entrevistas às Áreas de Referência que serão oportunamente indicadas pela equipe do projeto. O consultor deverá entrevistar as empresas beneficiárias do projeto. As informações sobre as empresas serão fornecidas pela Assessora Técnica Nacional.

O avaliador revisará todas as fontes de informação relevantes, tais como:

- Documentos e arquivos de projeto;
- Relatórios do projeto e outros relatórios;
- Revisões orçamentárias;
- Documentos nacionais estratégicos e legais.

6. Requisitos Obrigatórios (eliminatórios) - ***Registrados no CV***

- Formação superior com pós-graduação;
- Ter realizado pelo menos duas avaliações de meio termo ou final de Projetos de Cooperação Técnica Internacional;
- Conhecimentos da Língua Inglesa (working knowledge).

O candidato que não atender aos requisitos obrigatórios acima será desclassificado.

7. Requisitos Desejáveis (pontuáveis) - ***Registrados no CV***

- Experiência em atividades relacionadas ao gerenciamento de resíduos no Brasil.
- Experiência em elaboração, acompanhamento ou avaliação de projetos de cooperação técnica desenvolvidos com o PNUD.
- Experiência na avaliação de projetos de apoio ao Protocolo de Montreal.
- Experiência na avaliação de projetos de apoio a outros Protocolos e Convenções (Protocolo de Quioto, Protocolo de Minamata e Convenção de Estocolmo).

8. Prazo de Execução

O trabalho deverá ser realizado em 45 dias corridos, a partir da assinatura do contrato.

9. Cronograma de Entrega e Pagamento de Produtos

Produtos	Previsão entrega dos Produtos	Pagamento
1 – Plano de Trabalho	15 dias a partir assinatura Contrato	20%
2 – Relatório de Coleta e Análise de Dados	30 dias a partir assinatura Contrato	30%
3 – Relatório Avaliação de Meio Termo do Projeto (em português e inglês)	45 dias a partir assinatura Contrato	50%

10. Supervisão e Condições de Pagamento

O acompanhamento das atividades e aprovação dos produtos decorrentes deste contrato serão feitos pela Gerência do Projeto BRA/14/G72, em articulação com o PNUD.

a) O aceite dos produtos levará em consideração a qualidade dos mesmos e o atendimento aos critérios previstos.
b) Os pagamentos estão condicionados ao aceite dos produtos descritos nesses Termos de Referência.

11. LOCAL DE TRABALHO

Não há local definido para a prestação da consultoria. No entanto, o consultor deverá estar disponível para reuniões nas dependências do PNUD, em Brasília.

12. COMPROVAÇÃO DE REQUISITOS

Para participar do processo seletivo e para assinatura do contrato, o candidato deverá possuir material disponível comprobatório dos requisitos especificados para o respectivo perfil. Somente será contratado o consultor que apresentar o material comprobatório do atendimento integral aos requisitos mínimos estabelecidos no edital, no momento em que isto for exigido.

Formação acadêmica: A formação/titulação será comprovada por meio de **cópia** do Diploma ou Certificado de Conclusão de Curso de Graduação e pós-Graduação *lato sensu* e/ou *stricto sensu* (mestrado e doutorado).

Idiomas: A fluência em língua inglesa (eliminatória) será aferida por meio da apresentação de certificado de comprovação de proficiência e/ou certificado de conclusão de curso em língua inglesa. A fluência oral em língua inglesa será ainda avaliada durante entrevista com os candidatos.

Experiência: A experiência profissional deverá ser comprovada por meio de currículo (CV) assinado e informando, no mínimo, o local onde foram realizados os serviços, a função desempenhada, o período de realização e o nome e telefone de pessoa para contato e comprovação das informações fornecidas. Ao currículo poderão ser anexados outros documentos que auxiliem a comprovação da experiência profissional, tais como informações detalhadas sobre o escopo de serviços realizados, estudos ou relatórios realizados, etc.

13. REMUNERAÇÃO DA CONSULTORIA

O candidato deverá propor o valor global para os serviços de consultoria, em arquivo PDF, separadamente do currículo. O valor a ser considerado deve ser bruto, incluindo todos os impostos pertinentes à legislação brasileira.

Se houver necessidade de viagens, estas serão definidas pela Gerente de Projetos e ficará a cargo do Projeto BRA/14/G72 as despesas relativas às passagens aéreas e diárias, a partir do município-base do consultor. Portanto, esse custo não deverá constar na proposta.

Qualquer despesa para cobertura de deslocamento e estadia fora das condições acima especificadas deverão ser expressas e previamente autorizadas pela Coordenação Nacional do Projeto.

14. DISPONIBILIDADE

O candidato deve ter disponibilidade para início imediato dos trabalhos.

Anexo III – Critérios de Seleção / Avaliação

De acordo com as normas do PNUD aplicáveis à contratação de consultores na modalidade IC, as candidaturas deverão conter Proposta Técnica (CV) e Proposta de Preço (honorários).

Será desconsiderada a proposta enviada em desconformidade com o previsto no presente Edital:

1. Proposta Técnica: Currículo (anexado de eventuais comprovantes das competências e experiências relatadas) e

2. Proposta de Preço (valor global).

OBS: CV e Proposta de Preço (assinada em DF) em arquivos separados.

Será utilizado o critério de **TÉCNICA E PREÇO** para a classificação final dos candidatos e seleção do consultor.

1.1 1. CLASSIFICAÇÃO DAS PROPOSTAS TÉCNICAS (ANÁLISE/PONTUAÇÃO DO CV & ENTREVISTA)

A nota máxima na Qualificação Técnica é 100 (cem) pontos.
Os critérios de Qualificação Técnica serão divididos em 02 (duas) etapas:

a) 1ª etapa (eliminatória/não pontuável): Análise do CV referente ao cumprimento dos requisitos obrigatórios exigidos nos Termos de Referência.

Os candidatos que não atenderem aos critérios mínimos obrigatórios descritos nos Termos de Referência serão desclassificados nesta etapa. Também serão desclassificados na 1ª etapa os candidatos que não enviarem a Proposta e Preço.

b) 2ª etapa (classificatória/pontuável): Análise Curricular & Entrevista.
Os critérios para análise curricular estão dispostos no quadro abaixo. Somente serão analisados os currículos dos candidatos classificados na 1ª Etapa da Qualificação Técnica.

Critérios de Pontuação - 2ª Etapa da Qualificação Técnica (CV & Entrevista)			
CRITÉRIOS	**Pontuação***	**Peso**	**Subtotal (max)**
ANÁLISE CURRICULAR			
Experiência em atividades relacionadas ao gerenciamento de resíduos no Brasil.	0 a 5	3	15
Experiência em elaboração, acompanhamento ou avaliação de projetos de cooperação técnica desenvolvidos com o PNUD.	0 a 5	5	25
Experiência na avaliação de projetos de apoio ao Protocolo de Montreal.	0 a 5	4	20
Experiência na avaliação de projetos de apoio a outros Protocolos e Convenções (Protocolo de Quioto, Protocolo de Minamata e Convenç Estocolmo).	0 a 5	2	10
ENTREVISTA			
Avaliação das experiências específicas nas áreas relacionadas aos Termos de Referência e fluência no idioma inglês.	0 a 5	6	30
Nota Máxima da 2ª Etapa da Qualificação Técnica			**100**

* A pontuação será aferida de acordo com o seguinte conceito:

5 pontos excelente
4 pontos muito bom
3 pontos bom
2 pontos satisfatório
1 ponto inferior
0 ponto inexistente

Sobre a avaliação:

O Comitê de Avaliação será composto por, no mínimo, três membros (Staff PNUD) que atribuirão notas individuais de avaliação. A nota final do candidato será a média ponderada das notas individuais dos avaliadores.

As pontuações individuais serão atribuídas de acordo com as informações apresentadas pelo candidato no *Curriculum Vitae* (CV) e de acordo com seu desempenho durante a entrevista. Para tanto, é importante que o candidato indique claramente em seu CV as experiências profissionais requeridas, tanto na parte obrigatória como na parte pontuável, de forma que o Comitê de Avaliação possa realizar a análise adequada.

A entrevista será pontuada, de acordo com os critérios previstos no quadro acima. Durante a fase de entrevistas, será verificada ainda a fluência oral em inglês, conforme declarado pelo consultor em seu CV. O não atendimento a este requisito, por se tratar de requisito obrigatório, implicará na eliminação do candidato.

A entrevista será realizada por telefone, Skype ou presencial. Os candidatos serão comunicados com antecedência mínima de 24h, via e-mail ou telefone, da data e horário para a entrevista. As entrevistas terão a duração estimada de 30 minutos a 1 hora e serão no mesmo formato para todos os candidatos.

1.2 2. CLASSIFICAÇÃO DAS PROPOSTAS COMERCIAIS (PREÇO) – Classificação Final

Serão abertas as propostas comerciais apenas dos candidatos que obtiverem **a Nota Técnica Final com um mínimo de 70 pontos na 2ª Etapa da Qualificação Técnica (Análise Curricular & Entrevista).**

A Nota da Proposta Comercial – NC será calculada de acordo com o seguinte:

$$NC = 100 \times MinPP / Ppi$$

Onde:
NC = Nota da proposta comercial
MinPP = Proposta de menor preço
Ppi = Proposta de preço em avaliação
À proposta de menor preço será atribuída nota 100 (cem).

O Resultado Final - RF do processo do candidato será dado pelo somatório da Nota Técnica Final (NT) multiplicada pelo fator 0,70, com a Nota da Proposta Comercial (NC) multiplicada pelo fator 0,30, ou seja:

$$RF = (NT \times 0,70) + (NC \times 0,30)$$

Será selecionada a proposta que alcançar o maior Resultado Final.

1.3 3. CONSIDERAÇÕES ESPECIAIS

Esta contratação será conduzida pelo PNUD, seguindo as normas e diretrizes deste organismo (seleção simplificada e contratação na modalidade de IC – *Individual Contractors*).

"De acordo com as regras das Nações Unidas, a contratação de servidores ativos da Administração Pública Federal, Estadual, do Distrito Federal ou Municipal, direta ou indireta, bem como empregados de suas subsidiárias ou controladas, é permitida somente em condições especiais."

5.2 Plano de Trabalho

Plano de Trabalho

BRA/14/G72 – Projeto Demonstrativo para o Gerenciamento e Destinação Final de Resíduos de SDO

1. Lista de Documentos

- Documento de Document (PRODOC)
- Termos de Referência
- Relatório Anual de Progresso
- Plano Nacional de Eliminação de CFC no Brasil
- Relatório de Atividades do Projeto ou balanço de atividades e execução financeira de 2015 até o presente momento
- Planos de Trabalho
- Manifestações de Interêsse
- Relatórios de Missão
- Contratos com empresas ou com CRAs
- Relatórios de Licitações e Requisições de Compras em geral
- Solicitações de contratações de serviços e consultorias
- Relatórios de produtos de Consultores
- Outros documentos pertinentes
- Boletins e Folders
- Apresentações do Projeto BRA14/G72
- UNDP/GEF Guidance for Evaluation

2. Coleta de Dados, com Entrevistas e Questionário

2.1. Entrevistas com especialistas que informam sobre o Gerenciamento e Destinação Final de Resíduos de SDOs e outras questões relacionadas aos critérios e aplicação do questionário.

Questionário

As entrevistas com especialistas que informam sobre o Gerenciamento e Destinação Final de Resíduos de SDOs por meio de questionário, incluindo outras questões relacionadas aos critérios definidos pelo *Handbook on Planning and Evaluating for Development Results.*

A Coleta de dados também incluirá a identificação de fontes de informação e questões como:

1) questões relativas à efetividade do monitoramento dos indicadores que devem medir o progresso do projeto;

2) Qual seu parecer sobre a sustentabilidade das ações do Projeto em relação ao PNC?

3) Qual, em sua opinião, seria o papel catalítico ou de impulsionador dos objetivos do Projeto?

4) Quais seriam, a seu ver, as melhores práticas e as piores práticas advindas da execução do Projeto? E o impacto de seus resultados?

A análise de dados permitirá avaliar os resultados e as lições aprendidas pelo Projeto e também permitir recomendações para políticas públicas relacionadas com os objetivos do Protocolo de Montreal?

Considerando o escopo da AMT, ou seja, avaliação das atividades e resultados dos componentes definidos nos Termos de Referência, os resultados definidos no projeto estão descritos abaixo:

Resultado do Componente 1: Sistema Integrado de Gerenciamento de Resíduos de SDOs estabelecido, contemplando assistência técnica para o recolhimento, capacitação, armazenamento, consolidação e transporte;

Resultado do Componente 2: Incineração de resíduos de SDOs demonstrada.

Iniciamos com a duas questões chave:

- Quando se deu o início do Projeto? Teve demora em iniciar sua implementação?

- O Sistema Integrado de Gerenciamento de Resíduos de SDOs está em funcionamento?

- A seu ver, o Sistema poderia ser estabelecido antes mesmo de se ter consolidado as SDOs e de se ter incineradores implantados?

Em relação ao PRODOC, seus indicadores e procedimentos para implementação:

1) Os indicadores de monitoramento que possam medir o progresso do projeto são eficazes? Como se dá a eficácia?;

2) Como foi a participação das empresas nas Manifestações de Interesse e partes envolvidas?

3) A implementação do projeto, a seu ver, tem elementos que podem ser replicáveis?

4) A implementação do Projeto estabelece ou define links com outros projetos ou programas?

5) Existe a possibilidade de incluir e incorporar mais parceiros ao Projeto? O que você recomendaria?

6) Como ve a sustentabilidade das ações do Projeto?

7) Você acha que o Projeto poderia ter uma correção em sua implementação ou em sua formulação?

8) Como tem sido realizada a disseminação das informações sobre a importância da destinação final das SDOs?
Considera importante divulgar os resultados parciais do projeto?

9) Quanto ao nível de participação dos envolvidos na implementação dos componentes do projeto? Como você tem avaliado?

Buscar também responder às questões de Avaliação de Meio Termo (ANEXO C do TOR) Questões

1) Relevância: Como se relaciona o projeto com os objetivos principais da área de interesse do Protocolo de Montreal e com as prioridades ambientais e de desenvolvimento a nível local, regional e nacional?

.....
....

2) Efetividade: Em que medida se tem alcançado os resultados e objetivos previstos do Projeto?
.....

3) Eficiência: O Projeto tem sido implementado de maneira eficiente em conformidade com as normas e os estandares internacionais e nacionais?
.....

4) Sustentabilidade: Em que medida há riscos financeiros, institucionais, socioeconômicos ou ambientais para sustentar os resultados do Projeto a longo prazo?
.....

5) Impacto: Há indícios de que o Projeto está contribuindo para reduzir a tensão ambiental ou melhorar o estado ecológico, ou que tenha permitido avanços para esses resultados?
.....

Outras questões relativas ao Esquema da Avaliação de Meio Termo:

- Indicadores de Linha de Base: Empresas contatadas etc

- Formulação do Projeto ou desenho do Projeto

- Lições de outros projetos relevantes (Colombia ou outro?)

- Como vê a Replicação do Projeto?

- Gestão Adaptativa

3. Viagem de Campo:

- São Paulo: 16 -18 de julho

- Elaboração de relatórios de campo, com análise das atividades desenvolvidas ou em desenvolvimento.

- Relatórios da reuniões – *briefing*

4. Esquema do Relatório de Avaliação de Meio Termo

SUMÁRIO

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5. Cronograma de Trabalho

De acordo com o Contrato de Consultoria, a duração ou tempo de realização do trabalho de Avaliação de Meio Termo do Projeto BRA/14/G72 é de 45 dias.

Produtos	Junho/2017	Julho/2017

Produto I – Plano de Trabalho	De 01 a 06/06	
Produto II – Análise dos documentos do Projeto	De 01 a 10/06	
Versão Preliminar do Relatório de Avaliação de Meio Termo	De 11/06 a 24/06	
Versão Final com discussão de comentários	De 25/06 a	12/07

5.3 Lista de Pessoas Entrevistadas

Anexo 3

Lista de Entrevistados

Nome	**Instituição**	**Localidade**
Raquel Martins Rocha	PNUD	Brasilia
Ana Paula Pinho Rodrigues Leal	PNUD	Brasilia
Rosenely Diegues	PNUD/Oficial de Programa	Brasília
Gabriela Teixeira Rodrigues Lira	MMA/Unidade de Ozônio	Brasilia
Frank Amorim	MMA/Unidade de Ozônio	Brasilia

5.4 Lista de documentos avaliados

Leitura e análise de documentos relacionados ao Projeto BRA 12/G72:

- Documento de Projeto (PRODOC)
- Termos de Referência
- Relatórios de Avaliação
- Relatório Anual de Progresso
- Politica Nacional de Resíduos Sólidos
- Relatórios de Atividades do Projeto
- Boletins e Folders
- Relatórios de Implementação 2016-2017
- "Handbook on Planning, Monitoring and Evaluating for Development Results"
- Outros documentos afins

5.5 Questionário Utilizado e Síntese dos Resultados

Anexo 5.5

Questionário

Avaliação de Meio Termo do Projeto BRA/14/G72

QUESTÕES

1. Quais são as principais dificuldades para o desenvolvimento do Projeto BRA/14/G72?

2. Na sua opinião, quais foram os principais achados ou descobertas que emergiram do processo de redação de documentos?

3. Que recomendações você elevaria para uma Revisão Substantiva do Projeto?

4. Quais são as ligações estabelecidas entre o desenvolvimento do Projeto com outros projetos e programas?

5. Qual é a relevância dos resultados do Projeto BRA/14/G72? Considera relevante e como se relaciona com os principais objetivos do Protocolo de Montreal?

6. Quanto à eficácia, se alcançada e resultados que se relacionam com o propósito do Projeto?

7. Sustentabilidade – consider que os resultados do Projeto como base para a implementação de políticas, projetos e programas em Mudança do Clima?

5.6 Formulário de Acordo do Consultor de Avaliação

Evaluation Consultant Agreement Form 30

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Mary Dayse Kinzo

Name of Consultancy Organization (where relevant): _____
I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at *(place)* on *date*

Signature: September/2016

www.undp.org/unegcodeofconduct

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