



MINISTRY OF ENVIRONMENT

MALE' REPUBLIC OF MALDIVES

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TERMS OF REFERENCE

For

REFRIGERATION AND AIR-CONDITIONING EQUIPMENT RETROFIT OR/AND REPLACEMENT PROGRAM FOR AN ESTABLISHMENT/FACILITY IN MALDIVES

21st October 2020

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1. Introduction

Maldives is a Party to the Montreal Protocol on Substances that Deplete the Ozone Layer and has acceded to the Vienna Convention and Montreal Protocol in May 1998. As a party to the Vienna Convention and Montreal Protocol on Substances that Deplete the Ozone Layer, Maldives has phased out several ozone depleting substances (ODS). To comply with its obligations under the Montreal Protocol, Maldives is currently implementing the phase-out of Hydrochlouroflourocarbons (HCFCs) by 2020.

With the import control on HCFCs accompanied with the ban on HCFC based equipment in December 2015, a tremendous increase in the import of Hydroflourocarbons (HFCs) has been observed in the recent years. The ODS survey carried in the Maldives in 2016 shows that with the implementation of HPMP in 2010 and subsequent enforcement of regulations, the percentage of HCFC consumption has gradually decreased and consumption of ODS alternative refrigerants have increased.

The report shows that the consumption level of HCFCs at the end of 2015 was at 40% while ODS alternatives accounts for 60% of the total refrigerant consumed in the country. Consumption of all ODS alternatives are projected to grow more than 250% during 2016-2030 period.

Maldives has ratified the Kigali Amendment (KA) which proposes to phase down the production and usage of hydrofluorocarbons (HFCs) by mid-2040. HFCs are man-made chemicals that are widely used in air-conditioning, refrigeration and foam insulation and are powerful greenhouse gases, more potent than carbon dioxide. As such they contribute significantly to climate change. KA is therefore a significant milestone in the international environmental protection as its achievement could help to reduce the global temperature rise by 0.5 degree Celsius by the year 2100.

The Fisheries Sector and Tourism sector are the largest consumers of ODS and ODS alternatives in the Maldives. Maldives being a tropical island country with a hot and humid climate, various types of cooling, refrigeration and air conditioning equipment are used in various establishments such as resorts, hotels, guesthouse, safari vessels, schools, hospitals and in fisheries complexes.

The Government of the Republic of Maldives through the Ministry of Environment is implementing “Go Green” financed by the New Zealand government and the Kigali Enabling



Activity financed by the Multilateral Fund for the Implementation of the Montreal Protocol, and intends to apply part of the proceeds for the selection of an establishment for replacing and/or retrofitting HCFCs and HFC equipment with R 290/R600a/HC blend or low GWP alternatives.

2. Objective

This program intends to completely phase-out HCFCs and HFC in an establishment by replacing the existing HCFC and HFC charged air-conditioners and refrigeration systems by replacing and/or retrofitting with R290/R600/HC blend or low GWP alternatives.

3. Scope of works

The tasks to be undertaken by the establishment include but are not limited to, the following:

1. Analysis of the past one-year energy usage of the facility
2. Provide the data of the refrigeration and air-conditioning systems including the capacity of the equipment, number of years, refrigerant used, maintenance carried out per year for each existing air-conditioner and refrigeration system.
3. If the replacement program includes air conditioners and refrigerators in the following range, it should meet the level 4 criteria set by the Maldives Energy Authority. MEA will verify the energy efficiency and ozone requirements based on the test reports submitted by the establishment.
 - a. Air conditioners: Single-phase single-split and unitary type air conditioners of both fixed speed and variable speed types, for household use including the rated capacities of up to 30000 Btu/hr.
 - b. Compression-type Direct-Cool (single-door) refrigerators and Compression-type Frost-Free (double-door, three-door and side-by-side) refrigerators including the rated capacities of 100l-650l.
5. Provide arrangements for the technician (s) to retrofit all the systems
6. Provide co-financing
7. Undertake the remaining retrofit of air-conditioners and refrigeration systems as co-financing from the establishment
8. Provide maintenance and servicing data as and when requested by the Ministry
9. Analysis of monthly energy bills for a one-year period after the retrofiting is completed to identify the savings occurred.

4. Deliverables

Details of deliverable	Duration
Draft work plan <i>Detailed plan for undertaking the retrofit</i>	1 week upon Signing the agreement



<p><i>The plan should include the schedule of procurement of systems, submission dates of required data, undertaking the retrofit, etc</i></p>	
<p>Analysis report</p> <p><i>Analysis report of the past one year energy usage of the facility</i></p>	<p>2 weeks from acceptance of work plan</p>
<p>Refrigeration and air-conditioning systems data</p> <p><i>Number of systems with HCFCs and HFCs data</i></p> <p><i>Total number of systems in the establishment/facility with their capacity, refrigerant, etc. This should include all the RAC equipment and not only the HCFC/HFC based equipment</i></p> <p><i>Number of systems to be replaced (all HCFCs and HFC based equipment) with their retrofit and replacement choice. This should include the requirements set by MEA</i></p> <p><i>Plan for the systems which would be replaced under this program</i></p>	<p>1 week upon signing of agreement</p>
<p>Procurement</p> <p><i>Finalization of type of refrigerant/systems after discussing with the Ministry</i></p>	<p>6 weeks from acceptance of work plan</p>
<p>Retrofitting all the systems</p> <p><i>Retrofit as per the work plan submitted</i></p>	<p>5 months from signing of the agreement</p>
<p>Monitoring report</p> <p><i>This should include the status of the removed systems for replacement program and the functioning of the replaced and retrofitted systems under this program</i></p>	<p>6 months from signing of the agreement</p>

5. Duration of the program

Duration of the assignment is 6 calendar months upon signing the contract

6. Reporting Requirements

The selected establishment should designate a focal point for the project and the focal point is expected to work closely with the National Ozone Unit of Ministry of Environment.

Weekly progress of the retrofit activities should be communicated with the National Ozone Unit.



7. Pre- Qualification

The establishment/facility should have HCFC or HFC based equipment installed.

8. Evaluation Criteria

The establishment/facility will be selected based on the following criteria:

Criteria	Weightage
Proposed HCFC or HFC phase-out in kilogram (formulae to calculate this – proposed total number of HCFC/HFC phase-out from this project (kg) / total number of HCFC/HFC in the premises (kg))	30%
Cost of retrofitting/replacement per kg of refrigerant (least cost proposal per kg / proposed cost per kg * 40)	40%
Proposed co-financing from the establishment Co-financing should be at least 10% of the total price of retrofitting/replacement proposed) (above 50% co-financing – 15Marks, 49%-20% co-financing – 10 marks, 19%-10% co-financing – 5 marks, less than 10% co-financing – 0 marks)	15%
Demonstrate availability of a Refrigeration and Air conditioning technician to carry out the servicing and maintenance of the systems (At least one technician with - Minimum 2 years of experiences in the field	15%

Note: depending on the least proposed price for retrofitting and the availability of budget, more than one proposal can be selected.

9. Payment Schedule

The payment will be released as follows

- 10% upon submission and approval of the work plan
- 10% upon submission and approval of Analysis report of the past one year energy usage of the facility and information of all the existing Refrigeration and air-conditioning systems
- 40% upon submission of the shipment order
- 30% upon completion of retrofitting the systems with funds provided by Ministry



- e) 10% upon completion of total retrofitting the systems with co-financing from the establishment and monitoring report.

Note: Client will designate a technician to assist in retrofitting the systems and for any other technical assistance required. This technician will provide guidance to the technician assigned by the establishment.

10. Application and Submission

Interested establishments may submit their applications along with the following documents (Standard forms provided in Annex 1) in a sealed envelope:

- **Form 1:** Profile of the establishment)
- Completed Current practice of maintaining and servicing the systems (**Form:2** Present mechanism for servicing and maintenance of the current systems)
- **Form: 3** Proposed HCFC/HFC elimination, and cost for replacing/retrofitting

Information of the existing HCFC/HFC systems

This should include the total number of HCFC/HFC based equipment with their refrigerant weight in the building/establishment/facility.

Proposed HCFC/HFC elimination,

Of the total number of HCFC/HFC based equipment (weight) please provide the total number of equipment and refrigerant weight to be phase-out **under** this project should be indicated.

Proposed price for retrofitting/replacing per kg of refrigerant

Price can be given separately for each equipment or/and in bulk.

Price will be calculated per kg of the proposed total HCFC/HFC refrigerants to be eliminated.

Percentage of co-financing from the establishment.

At least 10% of the total cost of retrofitting/replacing should be co-financed by the establishment. The proposed co-financing from the establishment should be indicated.

- Completed Methodology and Work plan (**Form 4:** Methodology and Work plan)
Methodology should include how the retrofitting will be done.
- Relevant documents demonstrating the experience and qualification of proposed Refrigeration and Air conditioning technician (**Form 5: Curriculum Vitae (CV) of the technician**)



Interested establishments may submit their proposals in a closed envelope before **1000hrs of 4th November 2020** to the Ministry of Environment. Electronic submission is not permitted. Late proposals will be rejected. Envelope shall be titled and addressed as mentioned below. Please provide name and contact details of the proponent in the envelope.

“Do not Open Before 4th November 2020 at 10:00 – Refrigeration and air-conditioning equipment retrofit or/and replacement program for an establishment/facility in Maldives

Procurement Section
Ministry of Environment
Green Building, Handhuvaree Hingun, Maafannu
Male’, 20392, Republic of Maldives
procurement@environment.gov.mv

Proposals will be opened in front of the proponents or their representatives who are present at the above-mentioned address at 1000hrs on 4th November 2020.

For further information please contact the following.

National Ozone Unit
environment@environment.gov.mv
procurement@environment.gov.mv



11. Annex 1: Standard Forms

Form 1: Profile of the establishment

[Provide here a brief description of the background and organization of the establishment.]



Form 2: Present mechanism for servicing and maintenance of the current systems

[Provide here the current practice of maintaining and servicing the systems. Whether it is done by an in-house technician or contracted to a servicing workshop, etc



Form 3: Proposed HCFC/HFC elimination, and cost for replacing/retrofitting

Information of the existing HCFC/HFC based units			Proposed HCFC/HFC elimination		Cost of retrofitting		
Equipment category (AC, refrigerator, Freezer, etc)	HCFC/HFC based Units in the premises	HCFC/HFC Refrigerant (in kg)	Number of units	Refrigerant (in kg)	Proposed Price for retrofitting / replacing	Co-financing from the establishment	Total Cost of retrofitting or and replacing
Eg: Air Conditioner (9000BTU)	2	1.6	2	1.6	A	B	A+B
Eg: Air Conditioner (18000BTU)	2	3	1	1.5	C	D	C+D
Eg: Cold Room (10HP)	1	11	1	11	E	F	E+F
..	..						
..						
.....						
Total	5	16.6	4	14.1			

- Note: The total cost should be quoted inclusive of Goods and Services Tax (GST) or any applicable Maldivian taxes as per the Tax Legislation
- If HCFC/HFC weight for an item is not given, the cost of that item will not be added to the total proposed cost.
- The Total cost for retrofitting is (proposed price + co-financing amount from the establishment)



Form 4: Methodology and Work plan

Methodology and work plan are key components of this Proposal. You are suggested to submit your Proposal with the following areas clearly described:

- a) *Methodology – How the retrofitting will be done, approach to undertake each activity, methodology for carrying out the activities and obtaining the expected output.*
- b) *Work Plan - In this chapter you should highlight the main activities and sub-activities of the assignment, their content and duration and delivery dates of the outputs*



Form 5: Curriculum Vitae (CV) of the technician

(Relevant documents demonstrating the experience and qualification of atleast one technician)

1. **Name of the technician:** *[Insert full name]:*

4. **Date of Birth:** _____ **Nationality:** _____

5. **Education** *[Refrigeration and Air-conditioning certification level or education level]:* _____

7. **Other Training** *[Indicate significant trainings undertaken related to refrigeration and air-conditioning]:* _____

8. **Work Experience:** *[List where staff has worked in the last ten years]:* _____

