



## MINISTRY OF ENVIRONMENT

MALE' REPUBLIC OF MALDIVES

Announcement Reference: (IUL)438-ENV/438/2020/113

### TERMS OF REFERENCE

For

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Refrigeration and air-conditioning equipment retrofit or/and  
replacement program for an establishment/facility

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09 July 2020

*Prepared by:*

National Ozone Unit



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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 Hydrochlouroflouorocarbons (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 Hydroflouorocarbons (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 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 retrofitting is completed to identify the savings occurred.

A technician would be hired by the Ministry of Environment to assist the National Ozone Unit and the establishment to carry out the tasks. Procurement of systems would be carried out by the establishment with the funding provided by the Ministry of Environment and with the co-financing from the establishment.

## 4. Deliverables

Details of deliverable	Duration
<b>Draft work plan</b>  <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><b>Analysis report</b></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><b>Refrigeration and air-conditioning systems data</b></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</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><b>Procurement</b></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><b>Retrofitting all the systems</b></p> <p><i>Retrofit as per the work plan submitted</i></p>	<p>5 months from signing of the agreement</p>
<p><b>Monitoring report</b></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. Qualification and Experience

To be eligible for this project the establishment/facility must demonstrate capacity to undertake the servicing and maintenance of the systems and the financial capacity to provide co-financing.

## 8. Evaluation Criteria

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

Criterion	Weightage
Methodology and workplan	10%
Price for retrofitting of all the existing HCFC and HFC based systems. Price should be given for all the equipment separately. (least cost based on the number of units and capacity of the units)	40%
Proposed co-financing from the establishment (based on the total number of units/systems)	40%
Demonstrate availability of a Refrigeration and Air conditioning technician to carry out the servicing and maintenance of the systems (At least one technician) <i>Experience of technician (each year/work completed carries 2 marks)</i>	10%

9.

## 10. Payment Schedule

The payment will be released as follows

- a) 10% upon submission and approval of the work plan
- b) 10% upon submission and approval of Analysis report of the past one year energy usage of the facility and Refrigeration and air-conditioning systems data
- c) 40% upon submission of the shipment order
- d) 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.

**Note:** Client will designate a technician to assist in retrofitting the systems and for any other technical assistance required.



## 11. 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 (**Present mechanism for servicing and maintenance of the current systems**)
- Information of all the existing refrigeration and air-conditioning systems and total Budget for retrofitting/replacing the existing systems including the co-financing from the establishment (**Form 3: Information of the existing systems and cost of retrofitting/replacing**)
- Completed Methodology and Work plan (**Form 4: Methodology and Work plan**)
- Relevant documents demonstrating the experience and qualification of proposed Refrigeration and Air conditioning technician (**Form 4: Curriculum Vitae (CV) of the technician**)

Interested establishments may submit their proposals no later than **1100hrs of 21<sup>st</sup> July 2020** to the following address. Electronic submission is not permitted. Late proposals will be rejected.

Procurement Section

Ministry of Environment

Green Building, Handhuvaree Hingun, Maafannu

Male', 20392, Republic of Maldives

[procurement@environment.gov.mv](mailto:procurement@environment.gov.mv)

For further information please contact the following.

National Ozone Unit

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## 12. 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.]



### Form 3: Information of the existing systems and cost of retrofitting/replacing

Information of the existing system						Cost of retrofitting / replacing		
#	Equipment category (AC, refrigerator, Freezer, etc)	Model/Brand	Capacity	Refrigerant used	Age of the equipment (or when the equipment was installed)	Refrigerant to be used (for retrofitting or for replacing)	Total Cost of the new system (for replacing the existing system) or retrofitting the existing system	Co-financing from the establishment
1	Eg: Air conditioning system			eg; HCFC 22, HFC ....				
2								
3								
4								

Indicate the total cost with co-financing from the establishment to be paid in Maldivian Rufiyaa.

Note: The total cost should be quoted inclusive of Goods and Services Tax (GST) or any applicable Maldivian taxes as per the Tax Legislation



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## 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 for each activity,*
- b) *Work Plan*

a) Methodology. *In this chapter you should explain your understanding of the objectives of the assignment, 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 4: Curriculum Vitae (CV) of the technician**

(Relevant documents demonstrating the experience and qualification of the 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]*: \_\_\_\_\_

\_\_\_\_\_

