



Royal Government of Cambodia

United Nations Development Programme

Ministry of Environment /National Ozone Unit

Implementation of the Refrigerant Management Plan: recovery and recycling of CFC-12 refrigerant and awareness and incentive programme for the MAC sub-sector (ref. KAM/REF/41/TAS/05)

The projects aims to implement a nation wide recovery & recycling of CFC-12 refrigerant, and awareness and incentive programme for the Mobile Air-Conditioning (MAC) sector and refrigeration service sub-sectors, providing funding to incentivate the retrofit of existing CFC based MAC units to employ non ozone depleting substances. More specifically, the project will (i) raise awareness about the CP/RMP and the incentive programme, (ii) purchase and equip selected MAC service centers with CFC-12 recovery and recycling units and ancillary equipment, (iii) train selected MAC service centers in the correct procedure for retrofitting MAC unit from CFC-12 to HFC134a refrigerant, (iv) set up the incentive programme and provide grants to vehicle owners applying for incentive payment, and (v) monitor the implementation of the incentive programme.

The project was approved by the 41st Meeting of the Executive Committee of the Multilateral Fund in December 2003 and will be executed under the NEX modality with the Ministry of Environment as the Executing Agent, and the National Ozone Unit as the Implementing Agency. As a component of the Cambodia Country Programme / Refrigerant Management Plan, the project will be implemented in close coordination with the other activities under the CP/RMP.

Note: The Executive Committee approved the project with the understanding that the Government would have flexibility in utilizing the resources available under this activity, to address specific needs that might arise during the project implementation; to the extent possible, this activity would be implemented in stages so that resources can be diverted to other activities, such as additional training or procurement of service tools, if the proposed results are not achieved; and this should not commence until the legislation controlling CFC imports is in place and measures have been taken to ensure that the local market prices of CFCs and non-ODS refrigerants are at least similar.

Royal Government of Cambodia

UNDAF Outcome(s)/Indicator(s):

Expected Outcome(s)/Indicator(s): National and sectoral strategies for sustained reduction and elimination of ozone depleting substance strengthened *(MYFF service line 3.6)*

Expected Output(s)/Indicator(s): Reduction of the consumption of CFC refrigerant in Cambodia by 20 ODP tonnes / CFC-12 MAC units retrofitted in 20,000 vehicles

Implementing partner: Ministry of Environment

Other Partners: National Ozone Unit / MOE

Programme Period: January 2004 to December 2007
Programme Component: Energy and Environment
Project Title: Implementation of the RMP: recovery and recycling of CFC-12 refrigerant and awareness and incentive programme for the MAC sub-sector (ref. KAM/REF/41/TAS/05)
Short Title: R&R and Incentive/MAC
Project ID: 00036314 (proposal: 00034270)
Project Duration: 4 years
Management Arrangement: National Execution

Agreed by:

Signature

Date

Government

Name: H.E. Mr. Keat Chhon
Title: Senior Minister, Vice Chairman,
Council for Development of Cambodia

Implementing partner

Name: H.E. Dr. Mok Mareth
Title: Minister
Ministry of Environment

UNDP

Name: Mr. Douglas Gardner
Title: Resident Representative

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ACRONYMS/ABBREVIATIONS

CFC	Chlorofluorocarbon
CP/RMP	Country Programme / Refrigerant Management Plan
HFC	Hydrofluorocarbon
MAC	Mobile Air-Conditioning
MLF	Multilateral Fund
MOE	Ministry of Environment
NEX	National Execution
NOU	National Ozone Unit
NPD	National Project Director
ODP	Ozone Depletion Potential
ODS	Ozone Depleting Substance
R&R	Recovery & Recycling
SAS	Strategic Area of Support
SBAA	Standard Basic Assistance Agreement
SC	Service Center
SRF	Strategic Result Framework
RGC	Royal Government of Cambodia
UNDP	United Nations Development Programme

Section I – Elaboration of the narrative

Part I. Situation Analysis

Cambodia acceded to the Vienna Convention for the protection of the ozone layer and the Montreal Protocol on substances that deplete the ozone layer on 27 June 2001. In order to meet its commitment under the Montreal Protocol, the Cambodia's Country Programme and Refrigerant Management Plan (CP/RMP) was developed and approved by the Royal Government of Cambodia (RGC) on 3 October 2003. The CP/RMP outlines the institutional and policy frameworks, strategies, and actions to be taken by the RGC and industries in order to phase out Ozone Depleting Substances (ODS) by 2010.

The estimated 94.23 ODP tonnes of Annex Group 1 ODS consumed in Cambodia during 2002 was employed entirely and exclusively by the refrigeration service sector: Mobile Air-Conditioning (MAC), and refrigeration and air-conditioning (R/AC). It included 93.35 ODP tonnes (99 %) of CFC-12 and by far, the greatest proportion of this consumption is the employment of CFC-12 in the servicing of vehicles¹ fitted with MAC (84 %), including replenishment of the refrigerant after leakage.

Based on the current consumption trend, Cambodia will need to reduce its consumption from 94.23 ODP tonnes to at least 47 ODP tonnes during 2004 to 2005 to meet 50 % reduction commitments, and another 34 ODP tonnes between 2005 and the end of 2006 to ensure its compliance with the 85 % reduction target of 2007 under the Montreal Protocol.

The proposed project - Implementation of the RMP: recovery and recycling of CFC-12 refrigerant, and awareness and incentive programme for the MAC sub-sector (ref. KAM/REF/41/TAS/05) – is an integral part of the CP/RMP and was approved by the 41st Meeting of the Executive Committee of the Multilateral Fund in December 2003².

The RGC considers this project to be a critical component of the CP/RMP that will bring direct reduction of CFC consumption within the shortest amount of time available to achieve the compliance to the Montreal Protocol.

Part II. Strategy

The project will provide funding to incentivate the retrofit of existing CFC based MAC units to employ non ozone depleting substances such as HFC134a, as well as recovery and recycling units and ancillary equipment to assure that these retrofits operations are carried out correctly and without emissions of ODS. More specifically, the project will:

- Set up the incentive programme and diffuse the information to vehicle owners and MAC or R&A/C servicing enterprises in Cambodia;
- Purchase and equip selected MAC service centers with CFC-12 recovery and recycling units and other ancillary equipment necessary to the undertaking of the a correct retrofit;

¹ Based on official vehicle registrations, it is estimated that there are 84,505 vehicles with MAC in 2002: 70,450 with CFC-12 system, 14,055 with HFC134a system.

² The approved project proposal is attached in Annex 3 of this project document.

- Organize a training workshop in the correct procedure for retrofitting MAC unit from CFC-12 to HFC134a refrigerant, recovery and recycling;
- Provide financial incentives and other support measures to facilitate the replacement or retrofit of MAC units to employ HFC134a refrigerant;
- Monitor the implementation of the incentive programme and follow-up on application received from MAC owners.

The project will result in a reduction in the number of CFC-12 based MAC units in Cambodia and will ultimately assist to obtain a complete phase out of ODS consumption presently employed in the servicing of these. It is expected that within four years the project would encourage the retrofitting of the CFC-12 MAC units of 20,000 vehicles and will have caused a permanent effect on ODS consumption of 20 ODP tonnes/year.

While direct impact of the project will not be enough to meet compliance alone, it is estimate that the project would generate tremendous awareness among the end-users and should lead to a multiplying effect of car owners that would voluntarily convert their CFC MAC to new alternative. The combination of the incentive programme with other actions included in the CP/RMP, such as ODS regulations, public awareness, and expected rise in CFC price due to production phase-out, should result in additional reductions in CFC consumption after 2006.

Incentive Programme

The objective of the incentive programme is to eliminate as much as possible of the consumption of CFC-12 in vehicle incorporating MAC units through the payment of an incentive to those vehicle owners that have existing MAC equipment employing R12 refrigerant. Vehicle owners with MAC units will be eligible to apply for an incentive payment if: (i) they replace the existing MAC equipment with new equipment that employs HCF-134a (R134a) refrigerant; or (ii) they permanently retrofit the existing MAC equipment to employ R134a.

The incentive programme will be operated on a "first come, first served" basis, until December 2007 or until the funds have been exhausted. The incentive payment would cover up to 50 % of the cost of a basic MAC replacement / retrofit and be limited to a maximum of 25 USD per vehicle³.

The replacement and retrofit will only be carried out by authorized MAC SC that have been selected by the NOU through an official selection process. The selected SC will be equipped with a minimal equipment⁴ and at least two technicians or mechanics from each of the selected MAC SC will be obliged to attend a workshop conducted by an International Consultant on correct retrofit procedures.

A public recycling center will also be constituted and sited within Phnom Penh to assure that all CFC-12 refrigerant recovered by the SC with portable recovery machines will be correctly purified prior to its reuse in any other systems still employing CFC-12.

A Technical Committee consisting of one or more refrigeration experts and representatives of related Government Ministries or Departments, such as Transport, Tourism or Commerce and

³ Guidelines for the R&R and incentive programme are provided in Annex 1 of the project proposal, in Annex 3 of the project document.

⁴ The list of equipment is provided in Annex 2 of the project document.

related entities such as the Automobile Association or the National Refrigeration Association will be set up. This Technical Committee will assist the NOU to select qualified MAC SC, to instigate the programme, and to evaluate its progress and results.

Part III. Management Arrangements

Execution

In line with the UNDP policy of promoting national ownership, leadership and accountability, the project will be nationally executed. The Ministry of Environment (MOE) will be the Executing Agent and the National Ozone Unit (NOU), based within the Department of Pollution Control of the MOE, will be the implementing agency of the project.

Subject to the project document and as per the National Execution Guidelines, the MOE will primarily be responsible for the planning and overall management of the activities of the project. The MOE will thus be accountable to UNDP for the production of outputs, the achievement of programme objectives, and therefore the use of UNDP resources.

Implementation

In implementing the project, the MOE will appoint a National Project Director to serve as the overall government manager of the project. The National Project Director (NPD) will be a senior serving member of the MOE and the Head of the National Ozone Unit. He will be the focal point from MOE for all projects related matters. The NPD will be in charge to: (i) ensure that the project achieves its objectives and expected outputs by utilizing the project resources in an efficient, effective, and transparent manner; (ii) ensure timely delivery of quarterly progress and financial reports to UNDP; (iii) approve project expenditures/financial reports, CDRs, and budget revisions; (iv) supervise the international and national consultant to be recruited by the project; and (v) perform all additional tasks that may be required for the smooth implementation of the project.

To facilitate the implementation, UNDP will also provide support services in accordance with the UNDP procedures, and as described in the Letter of Agreement between UNDP and the Royal Government of Cambodia for the provision of support services. These supports services include:

- (i) The international procurement of equipment for recovery and recycling of CFC12 refrigerant⁵;
- (ii) The identification and recruitment of the national consultant in close consultation and with the prior agreement of the MOE⁶.

An International Consultant will be directly selected and recruited by UNOPS based on the Letter of Agreement between the RGC and UNOPS⁷.

The NPD will carry out a performance assessment of the national and international consultants, inform UNDP Cambodia of the assessment result, and will discuss any necessary follow up action with UNDP, e.g. if the performance of the international/national consultant is not satisfactory.

⁵ List of equipment and specifications in Annex 2.

⁶ LOA between the RGC and UNDP in Section IV and TOR for the national consultant in Annex 1.

⁷ LOA between the RGC and UNOPS in Section IV and TOR for the international consultant in Annex 1.

Part IV. Monitoring and Evaluation

The project will be subject to review and reporting in accordance with UNDP NEX policies and procedures.

The international and national consultants will be under the overall supervision and guidance of the NPD, or his/her representative, and will consult and report to him/her.

The MOE will undertake a continuous self-monitoring of the project and report on a quarterly basis to UNDP Cambodia through quarterly progress and financial reports. The quarterly progress reports will provide a brief summary of the status of the project inputs and outputs delivery, explain variances from the workplan, and present the workplan and planned expenditures for each successive quarter. Annual Project Reports will provide a more in-depth summary of the work in progress.

This project being an integral component of the CP/RMP, the MOE will also be responsible to integrate the project progress into the overall progress report of the CP/RMP as per the monitoring arrangements provided in the CP/RMP.

As per the NEX guidelines, the project will also be subject to audit carried out by internal auditors or external auditors hired directly by UNDP. The audit report is an integral part of the monitoring and evaluation process and its comments shall be taken into account in the annual progress review of the project. The costs related to the audit will be charged separately to UNDP Montreal Protocol Units' project support costs.

As per decisions of the Executive Committee of the Multilateral Fund, this project is subject to independent monitoring and evaluation activities of the Executive Committee.

Part V. Legal Context

This project document shall be the instrument referred to as such in Agreement between the Government of Cambodia and the United Nations Development Programme signed by the parties on 19 December 1994, which will remain in effect until such time that a new Standard Basic Assistance Agreement will have been signed between the RGC and the UNDP. The host country-implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government cooperating agency described in that Agreement.

All signatories to the original project document must sign the budget revision when it involves a change in the project objectives or outputs.

In other cases, the Resident Representative alone may sign, provided that the other signatories have no objections. This procedure may be applied, for example, to annual mandatory revisions, or when the purpose of the budget revision is only to rephrase activities.

Section II. Results and Resources Framework

Intended SRF Outcome: Reduction of the consumption of CFC refrigerant in Cambodia by 20 ODP tonnes			
Outcome Indicator: CFC-12 MAC units retrofitted in 20,000 vehicles			
MYFF Service Line 3.6: National and sectoral strategies for sustained reduction and elimination of ozone depleting substance strengthened			
Project Title and ID: KAM/REF/41/TAS/05 - Implementation of the RMP: recovery and recycling of CFC-12 refrigerant and awareness and incentive programme for the MAC sub-sector (Project ID: 00036314)			
Intended Outputs	Time Frame	Indicative activities	Inputs
MAC SC identified and selected Awareness raised among vehicle owners, service enterprises	2004 to 05	Awareness generation and information dissemination to vehicle owners , MAC or R&A/C servicing enterprises in Cambodia about the existence of the incentive programme: (i) translation, printing and distribution of info-leaflets, (ii) identification and selection of MAC SC, (iii) media announcement and advertisements in newspapers, (iv) national awareness workshop targeting vehicle owners and MAC SC, (v) review and evaluation of the application received by vehicle owners.	NOU/Technical Committee Inter/Nat. Consultants Media and newspapers National workshop
MAC SC equipped	2004	Equipping of participating MAC SC: (i) International Competitive Bidding for CFC12 recovery and recycling equipment, (ii) identification of the equipment supplier and procurement of equipment to MOE/NOU, (iii) supply of equipment to the MAC SC.	NOU Inter/Nat. Consultants UNDP Equipment
MAC SC trained	2004	Training in retrofitting: training workshop provided to MAC SC in retrofitting procedures and related good practices, including recovery and recycling of refrigerants.	NOU Inter/Nat. Consultants National Workshop
R&R incentive programme operational and effective	2004 to 07	Preparation of the funding support mechanism - incentive programme: (i) establishment of the Technical Committee, (ii) development of operational guidelines, (iii) grants provided to vehicle owners applying for an incentive payment.	NOU/Technical Committee Inter/Nat. Consultants MAC SC Incentive payments
Regular meeting, quarterly and annual reports, audits	2004 to 07	Monitoring activities: day to day monitoring of the incentive programme and work done by the SC, regular reports and updates to the database, review maintenance records of the machines, perform surprise checks, etc.	NOU/Technical Committee Inter/Nat. Consultants Audits

Section III. Work plan and budget

BUDGET (USD)

BL	ACTIVITY	Budget Category	Description	Period 1 2004	Period 2 2005	Period 3 2006	Period 4 2007	Account	Dept ID	Oper Unit	Fund	Impl Agency	Donor ID
1	Activity1	PERINT	Intern. Consultant	8,000	6,000	5,000	5,000	71200	B0396	KHM10	63030	002009	10009
2	Activity1	PERLOC	National Consultant	5,000	5,000	5,000	5,000	71300	B0396	KHM10	63030	001368	10009
3	Activity1	TRAV	Local travel	750	750	750	750	71600	B0396	KHM10	63030	001368	10009
4	Activity1	SERCT	Translation	3,000	0	0	0	72100	B0396	KHM10	63030	001368	10009
5	Activity1	SERCT	Workshops	12,000	0	0	0	72100	B0396	KHM10	63030	001368	10009
6	Activity1	SERCT	Incentive payment	100,000	200,000	150,000	42,000	72100	B0396	KHM10	63030	001368	10009
7	Activity1	EQUIP	Equipment ⁸	68,000	0	0	0	72200	B0396	KHM10	63030	001368	10009
8	Activity1	MISC	Sundries	750	750	750	750	74500	B0396	KHM10	63030	001368	10009
TOTAL				197,500	212,500	161,500	53,500						

WORKPLAN - 2004

Expected outputs	Activity	Timeframe				Responsible partner	Funds	Budget Category	Description	Amount
		Q1	Q2	Q3	Q4					
R&R Incentive Programme operational and effective	Activity1		X	X	X	002009	63030	PERINT	International Consultant	8,000
			X	X	X	001368	63030	PERLOC	National Consultant	5,000
			X	X	X	001368	63030	TRAV	Local travel	750
				X	X	001368	63030	SERCT	Translation	3,000
				X	X	001368	63030	SERCT	Workshops	12,000
					X	001368	63030	SERCT	Incentive payment	100,000
			X	X	X	001368	63030	EQUIP	Equipment	68,000
			X	X	X	001368	63030	MISC	Sundries	750

⁸ A detailed budget description is provided in part 8 of the project proposal in Annex 3 of this project document.

Section IV – Other agreements

LETTER OF AGREEMENT

BETWEEN UNDP AND THE MINISTRY OF ENVIRONMENT

FOR THE PROVISION OF SUPPORT SERVICES

1. Reference is made to consultations between officials of the Ministry of Environment (hereinafter referred to as the “MOE”) and officials of UNDP with respect to the provision of support services by the UNDP country office for nationally executed projects. UNDP and the MOE hereby agree that the UNDP country office, with backstopping from the Montreal Protocol Unit of the Energy and Environment Group of Bureau for Development Policy as and when required, will provide support services in accordance with the activities of the project document “Implementation of the RMP: recovery and recycling of CFC-12 refrigerant and awareness and incentive programme for the MAC sub-sector (ref. KAM/REF/41/TAS/05, project ID: 00036314)”.
2. The UNDP country office will provide support services for execution activities, such as assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office will ensure that the capacity of the Executing Agent is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services will be recovered from the administrative budget of the office.
3. In addition, the UNDP country office will provide, at the request of the Executing Agent, the following support services for implementation activities:
 - a) Identification and assistance with and/or recruitment of project and programme personnel;
 - b) Identification and facilitation of training activities, including fellowship, short-term training and study tours;
 - c) Procurement of goods and services; and
 - d) Access to UNDP-managed global information systems, the network of UNDP country offices and specialized systems containing operations information, including rosters of consultants and providers of development services.
4. The procurement of goods and services and the recruitment of project and programme personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in the project document. If the requirements for support services by the country office change during the life of a project, the project document is revised with the mutual agreement of the UNDP Resident Representative and the Executing Agent.
5. Subject to the provisions of this project document, the relevant provisions of the Standard Basic Assistance Agreement between the Royal Government of Cambodia and UNDP (the “SBAA”), signed by the two parties on 19 December 1994, including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The MOE shall retain overall responsibility for the nationally executed project. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the project document.

6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA.
7. Upon request from the Executing Agency, the UNDP country Office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.
8. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.
9. If you are in agreement with the provisions set forth above, please sign and return to this Office three signed copies of this letter. Upon your signature, this letter shall constitute an agreement between the MOE and UNDP on the terms and conditions for the provision of support services by the UNDP country office for nationally executed project.

For the Executing Agency

H.E. Mr. Mok Mareth
Minister
Ministry of Environment

Date:

Signed on behalf of UNDP

Douglas Gardner
Resident Representative

Date:

**LETTER OF AGREEMENT BETWEEN THE
GOVERNMENT OF CAMBODIA AND UNOPS AS CO-OPERATING AGENCY
UNDER NEX PROJECTS**

Dear [Executive Director of UNOPS],

1. Reference is made to consultations between officials of the Government of Cambodia (hereinafter referred to as "the Government") and officials of the United Nations Office for Project Services (hereinafter referred to as "UNOPS") with respect to the participation of UNOPS in the implementation of UNDP assistance to project "Implementation of the RMP: recovery and recycling of CFC-12 refrigerant and awareness and incentive programme for the MAC sub-sector (ref. KAM/REF/41/TAS/05, project ID: 00036314)", to be executed by the Government. The latter shall be represented for the purpose of such execution by the Ministry of Environment.

2. In accordance with the project document and with the following terms and conditions, we confirm our acceptance of the services to be provided by UNOPS towards the implementation of this project. Close consultations will be held between UNOPS and the Government on the implementation of all aspects of the services to be rendered as described in attachment 1, "Description of Services," of this Letter of Agreement.

3. In carrying out this Letter of Agreement, including the procurement and delivery of the project inputs referred to below, UNOPS will follow the regulations, rules and procedures applicable to UNOPS.

4. The Government shall retain overall responsibility for the implementation of UNDP assistance to the project through its designated National Project Director.

5. As may be specified in attachment 1 hereto, the personnel assigned by UNOPS to the project and under contract with UNOPS shall work under the general supervision of the National Project Director, while remaining accountable to UNOPS for the manner in which assigned functions are discharged.

6. In the event of a disagreement between the National Project Director and UNOPS assigned project personnel, the matter under dispute shall be referred by the Project Director to UNOPS for the purpose of finding a satisfactory solution. In the interim, the decision of the Project Director shall prevail.

7. Upon acceptance of this Letter of Agreement and pursuant to the project budget and work plan under the project document the Government agrees to UNOPS' requesting advances of funds directly from UNDP, incurring expenditure within the limits set out in attachment 2, "Schedule of Services and Facilities to be provided by UNOPS, and making the necessary financial arrangements directly with UNDP for the reimbursement of expenditures incurred by itself, subject to applicable limits in accordance with the regulations, rules and procedures referred to in paragraph 3 above, as follows:

(a) Expenditures for personnel services, as may be provided in section 1 of attachment 2, are limited to salaries, fees, allowances and other emoluments including the reimbursement of income taxes due and including travel costs on appointment to the project, duty travel within the project country or region and repatriation costs. UNOPS

shall budget for the costs of such experts and consultants on the basis of estimated actual costs, and shall be reimbursed on the basis of actual costs. Adjustments in the expert months of services, indicated in attachment 2, may be made in consultation between the Government and UNOPS if this is found to be in the best interest of the project and if such adjustments are in keeping with the provisions of the project document;

(b) Expenditures for contracting of professional services from entities, as may be provided in section 2 of attachment 2;

(c) Expenditures for fellowships, or other training activities, as may be provided in section 3 of attachment 2. Within such total allocation, adjustments to the training component may be made in consultation between UNOPS and the Government, if this is found to be in the best interest of the project and if such adjustments are in keeping with the provisions of the project document;

(d) Expenditures for purchase of equipment, as may be provided in section 4 of attachment 2; and

(e) Within the budgetary limitations of the project document, the Government shall be responsible for providing miscellaneous services such as secretarial assistance, postage and cable services and transportation, as may be required by UNOPS assigned personnel in carrying out their assignment. However, expenditures for these services may be incurred by UNOPS within such amounts as specified in section 5 of attachment 2.

8. A cumulative statement of expenditure shall be submitted by UNOPS at 30 June and 31 December. The statement, to be prepared in accordance with the format given in attachment 3, will be submitted to the Government through the UNDP Resident Representative within 30 days following those dates. The Government will include the reported expenditure in the project delivery report.

9. UNOPS shall recast and rephrase the schedule of services and facilities (attachment 2) as necessary when submitting the statement of expenditure to the Government, subject to the expenditure flexibility provisions accorded by UNDP to executing agencies. The Government shall adjust its records and confirm the revision submitted by UNOPS.

10. UNOPS shall submit such reports relating to the inputs it provides, as may reasonably be required by the Project Director in the exercise of his or her duties.

11. UNOPS shall provide the Government with an annual report of non-expendable equipment purchased for the project. The report shall be submitted within 30 days following 31 December, and shall be included by the Government in its main inventory for the project.

12. Whenever appropriate, UNOPS shall submit candidates for posts foreseen in section 1 of attachment 2 and obtain clearance of the Government for the personnel to be assigned to the project.

13. The Government shall provide UNOPS with job descriptions/terms of reference for the incumbents of the posts to be filled.

14. UNOPS shall enjoy the privileges, immunities and facilities that are accorded to UNDP and to executing agencies and their personnel under the agreements concerning assistance concluded by the Government and UNDP. The privileges and immunities to which UNOPS and UNOPS personnel are entitled may be waived only by the Secretary General of the United Nations.

15. Any changes to the project document which would affect the work being performed by UNOPS in accordance with attachment 1 shall be recommended only after consultation with UNOPS.

16. Any amendments to these arrangements shall be effected by mutual agreement through an appropriate supplementary Letter of Agreement.

17. For any matters not specifically covered by this arrangement, the appropriate provisions of the project document and revisions thereof and the appropriate provisions of the financial regulations and rules of UNDP shall apply mutatis mutandi.

18. All further correspondence regarding the implementation of this agreement, other than signed Letters of Agreement or amendments thereto, should be addressed to **H.E. Mr. Mok Mareth, Minister, Ministry of Environment** (N. 48 Samdech Peah Sihanouk, Phnom Penh, Cambodia, Fax: 855 23 21 25 40).

19. The Government and UNOPS shall keep the Resident Representative fully informed of all actions undertaken by them in carrying out this agreement.

If you are in agreement with the provisions set forth above, please sign and return to this office one original of this letter. Your acceptance shall thereby constitute the basis for UNOPS' participation in the implementation of the project.

Yours sincerely,

For the Government of Cambodia

H.E. Mr. Mok Mareth,
Minister
Ministry of Environment

Date and signature:

Signed on behalf of the United Nations
Office for Project Services

[name and title]:

Date and signature:

Attachment 1

DESCRIPTION OF SERVICES TO BE DELIVERED

Project number and title:

KAM/REF/41/TAS/05 – “Implementation of the RMP: recovery and recycling of CFC-12 refrigerant and awareness and incentive programme for the MAC sub-sector”

Activities to be conducted by UNOPS:

The project will be implemented through National Execution, and will also be monitored by UNDP Cambodia and UNDP’s Montreal Protocol Unit (MPU). However, UNOPS will be in charge of the recruitment actions related to the International Consultant. The latter will not need technical guidance from UNOPS however as this will be provided by MPU.

As such, the only actions expected from UNOPS relate to the administrative aspects of the consultant’s contract, and organizing the travel to the country concerned.

Description of services: Same as above.

Attachment 2

BUDGET CORRESPONDING TO THE SERVICES TO BE PROVIDED BY UNOPS

Budget Category	Description	Period 1 2004	Period 2 2005	Period 3 2006	Period 4 2007
PERINT	International Consultant	8,000	6,000	5000	5,000

Note: Amounts include AOS (8%) of which 1 % will be reimbursed to UNDP Cambodia
TOTAL amounts to US\$ 24,000

ANNEX I

TERMS OF REFERENCE FOR

International and National Consultants

Background:

A team of two consultants will be recruited in the framework of the project: *"Implementation of the RMP: recovery and recycling of CFC-12 refrigerant and awareness and incentive programme for the MAC sub-sector (ref. KAM/REF/41/TAS/05)"*

- one international consultant;
- one national consultant.

The two consultants will be under the direct supervision of the National Project Director, who is the head of the National Ozone Unit, and will report directly to him. The consultants will work in close coordination with UNDP Cambodia and UNDP Montreal Protocol Unit (MPU) of the Energy and Environment Group, Bureau for Development Policy.

Duties:

The national consultant will:

- Provide regular advice to the NOU, the Technical Committee, and selected service enterprises regarding the development and implementation of the incentive programme;
- Monitor day-to-day the incentive programme and work done by the selected service enterprises regarding the retrofit of MAC Unit from CFC-12 to HFC134a, and recovery and recycling of CFC-12;
- Report on a regular basis as required by the NOU, and more in depth on a quarterly basis, on progress and results of the incentive programme, with detailed statements of the units retrofitted by each selected enterprise;
- Set up a computer database with regular updates with the list of retrofitted equipment along with the identity of the owner, the registration and number of the vehicle, amount of refrigerant recovered / recycled, etc;
- Review the maintenance records of the machines, such as the timely changing of recycling filters in accordance with equipments specifications, and report to the NOU to undertake measures to assure the quality of the recycled refrigerant;
- Perform surprise checks to verify that the vehicles with MAC retrofitted have not returned to employing CFC-12 refrigerant.

The international consultant will:

- Select and supply for translation a training manual on retrofitting practices of MAC;
- Conduct two national workshops (one awareness workshop and one training workshop) during at least two separate visits to Cambodia;
- Provide expert advice in the procurement process for CFC-12 recovery and recycling equipment: (i) prepare a shortlist of potential suppliers, (ii) prepare/review the terms of reference for international competitive bidding, (iii) evaluate the bids, (iv) provide recommendations to MOE and UNDP;

- Provide overall guidance and advice to the NOU and the Technical Committee regarding the development and implementation of incentive programme (home base work);
- Follow up on the reports and activities of the national consultant (home base work) and evaluate the progress and results of the incentive programme;
- Assist the national consultant in providing guidance to potential applicants for an incentive;
- Assist and train the national consultant in reviewing application for incentives, and provide guidance on criteria used to evaluate and recommend approval of an incentive;
- Provide overall supervision and guidance (home base work) to the national consultant in order to assist him/her to perform the required duties.

Qualifications:

National Consultant

- Strong knowledge and expertise in environment and pollution control;
- Previous working experience in the mobile air-conditioning, refrigeration and air-conditioning sectors, as well as ODS recovery and recycling;
- Strong analytical abilities, communication and advocacy skills;
- Demonstrated ability to write clear and comprehensive reports, and to develop computer databases;
- Fluency in English and computer literate.

International Consultant

- Comprehensive knowledge and expertise in environment and pollution control;
- Previous working experience related to the Montreal Protocol, ozone depleting substances, and implementation of incentive programme for recycling and recovery of ODS;
- Previous experience in purchase and procurement of CFC-12 recovery and recycling units for the mobile air-conditioning sector;
- Previous working experience in retrofitting MAC units from CFC-12 to HFC134a refrigerant, and CFC-12 recovering & recycling;
- At least 5 years of demonstrated experience in related fields;
- Very strong analytical abilities, communication and advocacy skills;
- Demonstrated ability to write clear and comprehensive reports;
- Fluency in English and computer literate;
- Familiarity with the South East Asia region would be an asset.

ANNEX II

SPECIFICATIONS OF THE EQUIPMENT NEEDED FOR THE RECOVERY AND RECYCLING OF CFC REFRIGERANT FOR THE CAMBODIA PROJECT KAM/REF/41/TAS/05

1.0 SERVICE REQUIREMENTS

- 1.1 As an integrated part of the implementation of the Montreal Protocol dealing with reducing the emission of ozone depleting substances into the atmosphere, UNDP has been charged with assisting various countries in the recovery and recycling of CFC12 refrigerant contained in refrigeration and air-conditioning (R&A/C) equipment and installations during their maintenance, servicing, retrofitting or dismantling and scrapping due to redundancy.
- 1.2 The products dealt with in these particular specifications are for use within a nation-wide retrofit incentive project for MAC end-users and for the recovery and recycling of CFC12 refrigerant in Cambodia.
- 1.3 Supply and delivery are not specified here, but bids to provide the equipment specified here in will be expected to include DDU freight, packaging and delivery.
- 1.4 All electrical equipment offered must be compatible with the country's power supply, which in Cambodia is 220 v (single phase) 50 Hz. (confirmation of this must be stated in your bid).
- 1.5 All electrical equipment offered must continue operating normally under voltage fluctuations of $\pm 10\%$ and must be protected against voltage fluctuations that exceed these normal fluctuations by 25%. (Confirmation of this must be stated in your bid).
- 1.6 All the equipment will be expected to be capable of operating continuously for 10 hours per day, in temperatures of 40° C (105°F) and a high relative humidity. (Confirmation of this must be stated in your bid).

2.0 CAUTIONS

- 2.1 These specifications are the minimum requirements for the product. Products furnished to these specifications should meet or exceed all requirements herein. Modifications of or additions to basic standard products of less capacity or different usage to meet these requirements will not be acceptable. Products that have not been proven in the field for at least twelve months will not be acceptable.
- 2.2 The products shall conform in strength, quality, safety and workmanship to the accepted standards of the industry and will incorporate commercially available parts. Bids must detail the industrial standards met by the offered product, i.e. UL, CSA, CENELEC, CE, TÜF, etc. All non-consumable items and parts will have a minimum two years warranty.
- 2.3 The specifications may include special requirements. These are considered necessary for a correct implementation of this project and may not be commonly offered by all manufacturers. Nevertheless, the technical specifications presented herein are not to be construed as necessarily defining a particular manufacturer's product, model or features.
- 2.4 Review, complete and submit all sections of the forms provided under sections 3 and 4, accompanied by all supporting documents asked for within these, along with the cost quote. Bids submitted without these forms or with incomplete forms may be disqualified.
- 2.5 The procurement will be awarded to the bidder who best fully meets the equipment, spare part and technical support requirements designated herein at the lowest cost.

3.0 EQUIPMENT REQUIREMENTS

Please note in the right hand columns whether or not the complete item is offered in your bid.

ITEM	QUANTITY	DESCRIPTION	YES	NO
1	9 units	Portable recovery machine for CFC-12 including OFP device		
2	3 lots	Spare parts for item 1 estimated to be sufficient for 3 units' first two years of operation.		
3	1 units	Recovery/Recycling machine for CFC-12.		
4	1 lot	Spare parts for item 3 estimated to be sufficient for the unit's first two years of operation.		
5	4 units	MAC recovery/recycling/evacuation/charging machines		
6	4 lots	Spare parts for item 5 estimated to be sufficient for each unit's first two years of operation.		
7	13 units	Analysis equipment to identify types of refrigerant.		
8	13 lots	Spare parts for item 7 estimated to be sufficient for each identifier's first two years of operation.		
9	13 units	Refrigerant recovery equipment kit.		
10	13 lots	Spare parts for item 9 estimated to be sufficient for each kit's first two years of operation.		
11	13 units	Vacuum pump.		
12	13 lots	Spare parts for item 11 estimated to be sufficient for each pumps' first two years of operation.		
13	13 units	Digital vacuum gauge		
14	36 units	Refillable '50 Lbs.' CFC12 cylinders with OFP switch.		

- 3.1 Bid documents for item 1, 3, 5, 7, 9, 11 and 13 must be accompanied by full operating instructions for the item in English.
- 3.2 Bid documents for spare parts, items 2, 4, 6, 8, 10 and 12 must be accompanied by a fully itemised description in English of the spare parts and filters offered, indicating the quantity offered of each part and its unit price.
- 3.3 Bid documentation for items where compliance with certain safety or performance standards are asked for must be accompanied by copies of the pertinent documents issued by the certifying body.

4.0 SPECIFICATIONS: The required products must meet or exceed the following:

Please note your products compliance with these specifications in the right hand column

4.1 Item 1: 9 units CFC12 refrigerant recovery machines including one refillable CFC12 refrigerant cylinder.

4.1.1 Each unit will be configured as follows:

DESCRIPTION OF BASIC UNIT		Portable recovery machine for recovery of CFC12 refrigerant incorporating external cylinder overflow protection (OFP) device.	Yes	No
CAPACITIES (See Paragraph 5.0)	Minimum recovery rate. The capacity must be certified to ARI740/95 or comparable.	Vapour: 0.15 kg/min. Liquid: 3.00 kg/min.* * The liquid rate should be stated without employing push-pull method. If employed, "push-pull" <u>must</u> be indicated. (See paragraph 3.3)		
CONFIGURATION OF UNIT	As a minimum the unit will be equipped with:	Three services hoses with shut-off or ball valves, a replaceable acid/humidity filter (see section 8), an adjustable inlet pressure regulator and automatic OFP circuit.		
PRESSURE CONTROLS	Pressurestat	Separate high pressure and low pressure automatic stop/restart control and indicator light on control panel.		
INCREASED VACUUM PROCESS	Minimum: -0,7 Bar	Separate switch to over-ride low pressure control and allow recovery in low pressure conditions or pulling of a minor vacuum at end of the recovery process.		
COMPRESSOR	Minimum Capacity: Oil-lubricated - 3/8HP Oil-less - 1/2HP	'Oil-less' or oil lubricated will incorporate protection against liquid hammer.		
CONDENSER		Large heavy duty, fan cooled condenser		
OVERFILL PROTECTION (OFP)	A light on the unit will indicate overflow	The OFP device which will be triggered by an OFP switch in an external refillable cylinder will stop refrigerant transfer. (compatible with item 14)		
HOUSING	Operational texts on the unit will be in English	Robust, in a fully enclosed metal or durable plastic cabinet with a single well balanced carrying handle. All exterior surfaces of metal cabinets must be rust-proof with a good paint finish. Easy removal will permit access to interior from above and at least three sides.		
INTERIOR DESIGN		Piping and wiring will be clear and simple and correspond to diagrams included in the maintenance and service instructions. All wires will be laced into a wiring harness with each wire labelled along its length with the appropriate wire number. All electrical devices will be plug and/or socket connected within the machine for ease of component replacement. Valves and filters will be easily accessible for maintenance and servicing. All major mechanical components and assemblies will be replaceable using simple tools (screw drivers and wrenches). There must be no requirements for field brazing or soldering of components during replacement.		
WEIGHT		Maximum weigh: 20 kg.		
OPERATING INSTRUCTIONS MANUAL	Full operating instructions in <u>English</u> must be attached to the bid	Operational texts on the unit will be in English. Operating instruction manual will be written in English and must be easily understood by a technician with little formal education or training.		

		Operating manual will describe and pictorially illustrate the steps for recovery in vapour or liquid phase, the purging of NCG and the actions to be taken before recovering another type of refrigerant. It will include basic maintenance and fault finding instructions, flow and wiring diagrams and a complete spare parts list		
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4.2 Item 2: 3 lots, spare parts for item 1.

4.2.1 Each lot of spare parts will include such wear and consumable parts (excluding filters, see section 8) in such quantities deemed necessary to assure correct and continued working during the first two years of operation of a maximum of 3 units. This item will include, as a minimum, one complete compressor unit and those spare parts which would be generally considered necessary to facilitate common non-warranty repairs, within Cambodia, during this period. A complete spare part list will be supplied within the Operating Manual.
Note: See Requirements, Section 3.2

4.3 Item 3. 1 unit, CFC12 refrigerant Recovery/Recycling machine for use at a Public Recycling Centre.

4.3.1 Each unit will be configured as follows:

DESCRIPTION OF BASIC UNIT	Not designed specifically for automotive A/C systems (MAC)	CFC12 refrigerant recovery/recycling unit designed to recover from a refrigerant cylinder as well as directly from an A/C or refrigeration system. The machine should be capable of being field converted to HFC 134a using a factory supplied kit.	Yes	No
PROCESS	The process will not be controlled by micro-processors.	The recovery, recycling and transfer of the CFC12 to the external cylinder will be performed in one single pass and a continued process (not multi-pass) and will be fully automatic (i.e. minimum operator control). The unit will be capable of processing 40 kg. of CFC12 without operator supervision.		
CAPACITY (See section 5.0)	Minimum recovery rate	Vapour: 4,5 kg/h at 4 Bar. Liquid: 5 kg/h.		
	Minimum processing rate	5 kg/h.		
STANDARD OF PERFORMANCE (See section 5.0)		The unit must be capable of cleaning CFC12 to the Standard SAE J1991 (R12), but will filter out oil to below 200 ppm.		
CONFIGURATION OF UNIT	Overfill protection of internal and external cylinders	The unit will be equipped with hour counter, low pressure gauge (metric), pressure controls, individual replaceable filters, automatic purge of non-condensable gases and service hoses.		
CONTROL PANEL	Operational texts in English	Simple and easy operation with clear instructions		
PRESSURE CONTROLS AND SAFETY VALVES		Low and high pressure controls, suction pressure control, relief valve and cylinder overfill protection.		
SUCTION ACCUMULATOR		Heated suction accumulator including oil separation.		
INTERNAL OR EXTERNAL CYLINDER INCORPORATING A DEVICE FOR PURGING NON-CONDENSABLE GASES (NCG)	Transfer of refrigerant from internal to external cylinder only if external cylinder is	Internal cylinders will incorporate a refrigerant level indicator and an OFP control (with indicating light) to stop the recycling process when filling reaches 80% of capacity, to trigger transfer of refrigerant to external cylinder and restart recycling process after transfer.		

	connected			
NON-CONDENSABLE GAS PURGE PROCESS	Automatic or semiautomatic purge process.	Control of purge by electronic pressure and temperature compensation (not monitored and performed manually by operator).		
FILTERS	Minimum filter life 50 hours. (see Filters, section 8)	One disposable high capacity acid filter ("Burn-out" quality) and one disposable humidity filter. If an oil lubricated compressor is incorporated, an oil filter will be situated after this.		
COMPRESSOR	Minimum capacity: Oil-lubricated - 3/8HP Oil-less - 1/2HP	'Oil-less' or oil lubricated. Oil lubricated compressors will incorporate an optical oil-level indicator, automatic oil return and protection against liquid hammer.		
GAUGES	Metric scales.	Low pressure gauge (metric) with °C temperature scale for CFC12 refrigerant.		
EXTERNAL CYLINDER OVERFILL PROTECTION	A light in the unit will indicate over-fill.	The OFP device (set at 80%), triggered by an OFP switch in an external cylinder, will stop refrigerant transfer to the cylinder. (compatible with item 13)		
STOP AND RESTART CONTROL		Automatic process stop and low pressure control to indicate that the external source is empty and automatic process restart, if pressure rise again, (e.g. evaporating).		
OIL DRAINAGE		The unit will incorporate an exterior oil draining valve and measuring cup.		
HOSE CONNECTION AND HOSES		One 1/4" flare inlet and one 1/4" flare outlet connection with shut off valves. Different coloured service hoses with self-closing or ball valves.		
INTERIOR DESIGN		Piping and wiring will be clear and simple and correspond to diagrams included in the maintenance and service instructions. All wires will be laced into a wiring harness with each wire labelled along its length with the appropriate wire number and electrical devices will be plug and/or socket connected within the machine for ease of component replacement. Valves and filters will be easily accessible for maintenance and servicing and all major mechanical components and assemblies will be replaceable using simple tools (screw drivers and wrenches). There must be no requirements for field brazing or soldering of components during replacement.		
HOUSING AND MOBILITY	Operation texts on unit will be in <u>English</u>	Robust fully enclosed cabinet with handle and wheels with breaking devices. Easily removed front panel will permit access to interior from at least three sides. Any exterior metal surfaces must be rust-proof with a good paint finish.		
DIMENSIONS		Should occupy the minimum floor space and not be more than 120 cm high.		
OPERATING TEXTS AND INSTRUCTIONS MANUAL	Full operating instructions in <u>English</u> must be attached to bid	Operation texts on the unit will be in English. Operation manual instructions will be written in English and will include basic maintenance and fault finding instructions, flow and wiring diagrams and a complete spare parts list.		

4.4 Item 4: 1 lot, spare parts for item 3.

4.4.1 Each lot of spare parts will include such wear and consumable parts (excluding filters, see section 8) in such quantities deemed necessary to assure correct and continued working during the first two years of operation of one unit. This item will include, as a minimum, one complete compressor unit and those spare parts which could be generally considered necessary to facilitate common non-warranty repairs, within Cambodia, during this period. A complete spare part list will be supplied within the Operating Manual.
Note: See Requirements, section 3.2.

4.5 Item 5: 4 units CFC12 refrigerant recovery/recycling/evacuating/charging machine for mobile air conditioning (MAC) in vehicles.

4.5.1 Each unit will be configured as follows:

DESCRIPTION OF BASIC UNIT		CFC12 refrigerant recovery/recycling/evacuating /charging unit specifically designed to recover CFC12 refrigerant directly from an automotive or mobile A/C system, recycle the refrigerant, evacuate the system with a vacuum pump and recharge from a heated or weight controlled internal or external cylinder. The machine should be capable of being field converted to HFC134a using a factory supplied kit.	Yes	No
RECOVERY AND RECYCLING PROCESS	Process will not be micro-processor controlled	The recovery, recycling and transfer of the CFC12 refrigerant to an internal or external cylinder will be performed in one single continued process (not multi-pass). storage/charging This process will be fully automatic and will be capable of recovering, recycling and transferring a minimum of 4kg. of CFC12 refrigerant to the same cylinder which will be used for the charging process, without operator supervision.		
CAPACITY		Minimum recycle rate: Vapour. 0.3 kg/min.		
STANDARDS OF PERFORMANCE	(See Section 5.0)	Unit must be ETL or UL certified as capable of cleaning CFC12 to the standard of SAE J1991 (R12).		
STANDARDS OF SAFETY	(See Section 5.0)	Unit must be ETL or UL certified as meeting UL1963.		
CONFIGURATION OF UNIT	Bar and psi scales on gauges (See Section 5.0)	Unit will be equipped with hour counter, low and high pressure and vacuum gauges, pressure controls, individual replaceable filters, automatic or semiautomatic purge of NCG, OFP for internal and external cylinder, vacuum pump and minimum 3,5m service hoses with shut-off valves. The unit must be ETL or UL certified as meeting SAE J1990, Recycle Equipment (R12).		
CONTROLS		Not digital controls.		
CONTROLS PANEL	Operational texts in <u>English</u>	Simple and easy operation, with clear instructions silk screened on the control panel, in <u>English</u> .		
PRESSURE CONTROLS AND SAFETY DEVICES		Low and high pressure controls, suction pressure control, relief valve and internal and external cylinder OFP.		
SUCTION ACCUMULATOR		Suction accumulator including oil separation.		
OIL DRAINAGE		Unit will incorporate an exterior oil drain valve and measuring cup.		
CHARGING		Charging should be possible immediately after the recovery/recycling process without the need for the A/C to be running or in a vacuum.		
CHARGING PROCESS	Performed from cylinder used for storage after	Charging will be performed from a specific heated charging cylinder incorporated into the unit or by a weighing scale which is monitored on the controls		

	recycling process	panel.		
INTERNAL CHARGING CYLINDER		Heated internal charging cylinders will incorporate a heating element of a minimum of 125 watt (imbedded in the cylinder) and a clear visual refrigerant level indicator with scale.		
WEIGHT CONTROLLED CHARGING		Will incorporate automatic or easy and accurate manual calibration of the weighing mechanism. Amount charged will be controlled and monitored on the controls panel.		
INTERNAL CYLINDER OVERFILL PROTECTION (OFP)		Automatic control against overfill (OFP) of internal charging cylinder. This will stop the recycling process when cylinder is filled to 80% of capacity and will activate an indicating light on front panel.		
EXTERNAL CYLINDER OVERFILL PROTECTION (OFP)		Automatic control against overfill (OFP) of an external cylinder, (compatible with item 14). This will stop the recycling process when cylinder is filled to 80% of capacity and will activate an indicating light on front panel.		
PROCESS FOR NON-CONDENSABLE GAS (NCG) PURGE	Automatic or semiautomatic purge process.	Control of purge by electronic pressure and temperature compensation (not monitored and performed manually by operator).		
VACUUM PROCESS		Will use a vacuum pump (not the main compressor in vacuum mode). A pressure switch will prevent the release of refrigerant from A/C which has not been properly evacuated using the recovery process.		
VACUUM PUMP		Dedicated vacuum pump with a minimum vacuum level of 50 microns. Minimum free air displacement: 1.8 CFM (50 l/m at 50 Hz), [1.9 CFM (53 l/m at 60 Hz)].		
COMPRESSOR	Minimum capacity: Oil-lubricated - 3/8HP Oil-less - 1/2HP	'Oil-less' or oil lubricated. Hermetic compressors will incorporate an oil level sight tube, automatic oil return and protection against liquid hammer. The low and high side pressure will be automatically balanced prior to start-up.		
CONDENSER		A fan cooled condenser for operation in ambient temperature up to 120°F/50°C.		
FILTERS	Minimum life 50 hours. (see Filters, section 8)	One disposable acid and particulate filter and one disposable moisture filter. If an oil lubricated compressor is incorporated, an oil filter will be situated after this.		
GAUGES	Scales: Bar and psi	Analogue (not digital) low pressure, high pressure and vacuum gauges sited on controls panel.		
STOP AND RESTART CONTROL		Automatic process stop and low pressure control to indicate that the external source is empty and automatic process restart if pressure rises again. (e.g. evaporating)		
HOSE CONNECTION		One 1/4" flare inlet and one 1/4" flare outlet connection with shut off valves.		
SERVICE HOSES	Minimum length.	Two 3.5m (11ft) and one 2.5m (8ft) different coloured service hoses with self-closing and ball valve shut-off devices.		
INTERIOR DESIGN		Piping and wiring will be clear and simple and correspond to diagrams included in the maintenance and service instructions. All wires will be laced into a wiring harness with each wire labelled along its length with the		

		appropriate wire number. All electrical devices will be plug and/or socket connected within the machine for ease of component replacement. Valves and filters will be easily accessible for maintenance and servicing. All major mechanical components and assemblies will be replaceable using simple tools (screw drivers and wrenches). There must be no requirements for field brazing or soldering of components during replacement.		
HOUSING AND MOBILITY	Operation texts will be in <u>English</u>	Robust fully enclosed steel or durable plastic cabinet. Horizontal handle, two large rear wheels on an axle and two front casters with locking devices allowing good stability and mobility within workshop. Easily removed front panel will permit access to interior from at least three sides. Any exterior metal surfaces must be rust-proof with a good paint finish.		
DIMENSIONS		The overall machine size should not exceed 110cm high by 55cm wide by 55 cm deep. The weight should not exceed 75Kg.		
OPERATING TEXTS AND INSTRUCTION MANUAL	Full operating instructions in <u>English</u> must be attached to the bid.	All operation texts on the unit will be in <u>English</u> A comprehensive operation manual will be provided in the <u>English</u> language. The manual will explain in detail and clearly the various operations the machine can perform, filter changes, preventative maintenance and include a "trouble shooting" guide to identifying common operating problems. The Manual will include a complete spare parts list.		
SIMPLIFIED INSTRUCTIONS SHEET		A one page simplified operation guide will be provided in the <u>English</u> language. This sheet should explain and pictorially illustrate the basic steps required to operate the machine and will be written so as to be easily understood by a technician with little formal education or training.		

4.6 Item 3: 4 lots, spare parts for item 5.

4.6.1 Each lot of spare parts will include such wear and consumable parts (excluding filters, see section 5) in such quantities deemed necessary to assure correct and continued working during the first two years of operation of one unit. This item will include, as a minimum, one complete compressor unit and those spare parts which could be generally considered necessary to facilitate common non-warranty repairs, within Cambodia, during this period. A complete spare part list will be supplied within the Operating Manual.
Note: See Requirements, section 3.2.

4.7 Item 7: 13 units, refrigerant analyser.

4.7.1 Each unit will identify CFC12 and other refrigerants to permit rejection of mixtures of refrigerant before recycling. The refrigerant identifier will incorporate an alarm for flammable hydrocarbon and must be capable of identifying CFC12 refrigerant and its level of purity from contamination by other refrigerants (i.e. CFC, HCFC, HFC, hydrocarbons and air), within the industry's standard, with an accuracy that insures, at minimum, 98% identification of CFC12. Instructions will be in English.

4.8 Item 8: 13 lots, spare parts for item 7.

4.8.1 Each lot of spare parts will include such wear and consumable parts in such quantities deemed necessary to assure correct and continued working during the first two years of operation of one unit. This item will include those spare parts which would be generally considered necessary to facilitate common non-warranty repairs, within Cambodia, during this period. A complete spare part list will be supplied within the Operating Instructions.
Note: See Requirements, paragraph 3.2

4.9 Item 9: 13 units, recovery equipment kit.

4.9.1 Each recovery equipment kit will consist of:

CFC-12 GAUGE MANIFOLD Metric Pressure and °C Temperature Scales	1 unit. Including separate high and low pressure CFC-12 gauges, 2 valves, 3 ports, 3 standard hoses (minimum 72") of different colours incorporating ball tap shut-off valves.	Yes	No
HFC-134a GAUGE MANIFOLD Metric Pressure and °C Temperature Scales	1 unit. Including separate high and low pressure HFC-134a gauges, 2 valves, 3 ports, 3 standard hoses (minimum 72") of different colours incorporating ball tap shut-off valves.		
ELECTRONIC LEAK DETECTOR	1 unit. For detecting and locating leaks of CFC12 and HFC134a refrigerants.		
THERMOMETER	1 unit. Minimum: -40° to +50°C. Preferably also with °F scale		
ELECTRONIC WEIGHING/CHARGING SCALE	1 unit. For weighing as minimum an 80% full '50lb.' refillable CFC12 refrigerant cylinder, with scales in kg. and lb.		
TUBE PIERCING PLIERS	2 pieces. For minimum 1/4" copper tube. 1/4 SCHRAEDER valve connection, compatible with recovery machines hoses.		
SIGHT GLASS	1 piece. For viewing refrigerant. 1/4" connections must be compatible with recovery machine hoses.		
SERVICE HOSE	2 pieces. 3.5m (11ft) different coloured service hoses with self-closing and ball valve shut-off devices with 1/4" connections. 1 piece. Short service hose incorporating a ball tap shut-off valve and with 1/4" connections compatible with the sight glass.		
SERVICE COUPLING	2 pieces. 1/4" flare access.		
HI-SIDE ADAPTER KIT	1 kit, including a GM 1991 adapter as extra, if not in kit.		
HFC-134 ^a MAC SERVICE COUPLINGS	1 Set		
VALVE CORE REMOVER	1 piece, <u>Leak free model</u> , to remove SCHRAEDER valve cores.		
OIL CHARGE KIT	1 kit, Ester oil charging container with 1/4" couplings and, as minimum, 1 service hose hose with self-closing and ball valve shut-off devices with 1/4" connections.		
GLOVES AND GOGGLES	2 pairs of each.		
INSTRUCTIONS	Instructions for the use and maintenance of the individual articles included in this kit will be in English.		

4.10 Item 10: 13 lots, spare parts for item 9.

4.10.1 Each lot of spare parts will include such wear and consumable parts in such quantities deemed necessary to assure correct and continued working during the first two years of operation of one recovery kit. This item will include those spare parts which would be generally considered necessary to facilitate common non-warranty repairs, within Cambodia, during this period. A complete spare part list will be supplied within the individual Operating Instructions. Note: See Requirements, paragraph 3.2

4.11 Item 11: 13 units, portable two stage vacuum pump.

4.11.1 Each unit will conform with the following:

VACUUM PUMP	Two stage pump capable of evacuating small quantities of CFC12 refrigerant.	Yes	No
FREE AIR DISPLACEMENT	2.5 CFM (71 l/m)@50 Hz [3 CFM (85 l/m) @ 60 Hz].		

MINIMUM VACUUM LEVEL	0.5 mbar (375 microns)		
PORTABILITY	Portable, incorporating a single balanced carrying handle.		
OIL	Must run on mineral oil.		
OIL CHANGE	Must include a visible oil level sight glass and have an easy oil changing procedure.		
WORKING CONDITIONS	Ambient working temperature -5° to +50° C. Will be able to start under a vacuum of 5 mbar.		
INSTRUCTIONS	Instructions for the use and maintenance will be in English . <u>Note:</u> Full English operating instructions must be included with the bid		

4.12 Item 12: 13 lots, spare parts for item 11.

4.12.1 Each lot of spare parts will include such wear and consumable parts in such quantities deemed necessary to assure correct and continued working during the first two years of operation of one pump. This item will include those spare parts which would be generally considered necessary to facilitate common non-warranty repairs, within Cambodia, during this period. A complete spare part list will be supplied within the Operating Instructions.
Note: See Requirements, paragraph 3.2

4.13 Item 13: 13 units, digital vacuum gauge.

4.14 Item 14: 36 units, refillable DOT-4BA refrigerant cylinders with capacity for 50 lbs. of CFC12 refrigerant, incorporating 2 ports with valves (one liquid, one vapour). Incorporating an OFP switch, compatible with stop process in items 1, 3 and 5, to be triggered when 80% full. The cylinders will have a DOT 4BA-350 lbs. pressure rating, burst tested to DOT standard of 4 times rating, manufacture dated to be not more than two years old at time of shipment.

5.0 STANDARDS

5.1 Copies of the certificates showing the industrial quality, performance or capacity standards to which the equipment offered complies must be attached to the bids.

Note: Bids submitted without or with incomplete substantive documentation may be disqualified.

6.0 WARRANTY

6.1 All items of equipment will be supplied with a standard commercial parts and labour warranty covering defects in manufacture material or design for a minimum of two years. The warranty will be the responsibility of the bidder selected to supply the item and will be effective from the date of distribution of the equipment to those participating in the Project, within Cambodia.

The date of commencement, duration and complete conditions of warranty for all the products offered must be confirmed within the bid documents.

7.0 AFTER-SALES SERVICE

7.1 A correct after-sales service and technical support will be offered within Cambodia during the period of implementation of the project by UNDP/UNOPS. The agent responsible for this service will be expected to co-ordinate their services with the Ozone Office, the National Implementation Agency and if necessary, UNDP or UNOPS to assure the availability of a satisfactory supply of replacement parts and consumables, such as recycling filters, and to provide repair service and long-term sales to the R&A/C sector for the equipment supplied as well as to promote and encourage future demand for refrigerant recovery and recycling equipment after the project has been completed.

Confirmation that such after-sales service would be made available will be included within the bid document. If already available, the appointed service agency should be identified within the bid documents.

8.0 FILTERS

- 8.1 Unit price of each of the individual filters considered necessary for correct operation of either recovery or recovery/recycling machines will be indicated in the bid document.
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ANNEX 3

Project Proposal approved at the 41st Executive Committee Meeting of the Montreal Protocol