UNITED NATIONS DEVELOPMENT PROGRAMME

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PROJECT DOCUMENT

[Peoples Republic of Bangladesh]

Project Title: **HCFC Phase-Out Management Plan (HPMP Stage-II) For Compliance with the 2020 and 2025 Control Targets under the Montreal Protocol**

Project Number: **00110796 (AC Sector) and 00117012 (PMU).** (MLF Inventory number BGD/PHA/81/INV/51 and BGD/PHA/81/TAS/49)

Implementing Partner: Department of Environment (DoE) under the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of Bangladesh (GoB) and UNDP

Start Date: 01.04.2020 **End Date:** 31.12.2026 **PAC Meeting date:** 23 Oct 2019
Inter-ministerial meeting: 18 March 2020

Brief Description

The 81st Meeting of the Executive Committee (ExCom) of the Multilateral Fund (MLF) for the implementation of the Montreal Protocol (UNEP/OzL.Pro/ExCom/81/58; 22 June 2018) decision 81/39 approved the Hydrochlorofluorocarbon (HCFC) phase-out management plan (HPMP) Stage–II for Bangladesh for the implementation of Montreal Protocol (MP). For the implementation of HPMP Stage-II, United Nations Development Programme (UNDP) has been designated the lead implementing agency and United Nations Environment Programme (UN Environment) is the cooperating agency, with a separate fund allocation for each agency along with the Government of Bangladesh (GoB). The GoB has agreed to follow the Montreal Protocol schedule and is committed to reduce HCFCs consumption by 67.5% of the baseline by 2025. The implementation of Stage-II of the HPMP will help to phase out of 17.09 ozone depletion potential (ODP) tonnes of HCFC-22 used in the domestic and commercial air-conditioners manufacturing sector through UNDP's investment component. The phase-out of 17.09 ODP tonnes of HCFC-22 is equivalent to a net CO_2 emission reduction of 1,730,798 CO_2-eq tons[1]. This will assist Bangladesh in meeting the Montreal Protocol compliance target. Also, through conversion to R-290 and R-32 (refrigerant), energy savings will be achieved which, in turn, will ensure national energy efficiency improvements and indirect GHG emissions reduction. During the implementation of the HPMP Stage-II project, energy efficiency and health and safety issues are taken into consideration in line with national and international regulations, standards and guidelines.

The project will be implemented during 2019-2025. Total funding approved, in principle, was US$ 5,890,694 excluding support costs with a UNDP share being US$ 5,356,014. The first tranche of US$ 2,142,405 was approved through a multi-year performance-based agreement between the Government of Bangladesh and the Executive Committee. Subject to meeting the conditions for funding release as stipulated in paragraph 5 of the Agreement, the second and third tranches of US$ 2,142,405 and US$ 1,071,204 will be released to UNDP in 2020 and 2022 respectively.

In summary, the successful implementation of HPMP stage II will accelerate the GoB in phasing out the agreed HCFCs within the set target time, improving the energy efficiency in refrigeration and air conditioning (RAC) sector, reducing direct and indirect CO_2 emission.

Contributing Outcome (UNDAF/CPD, RPD or GPD): Bangladesh enhances effective management of the natural and manmade environment, focusing on improved sustainability (Outcome 2) Indicative Output(s): Phasing out of 17.09 ODP tonnes of HCFCs from RAC manufacturing sectors in Bangladesh. Total 1,730,798 CO_2-eq Tonnes GHG emission will be reduced in terms of direct and indirect emission. Efficiency improvement, saving of annual energy consumption and reduction of indirect CO_2 emission. Employment creation owing to technology change and Increase of role of women employment. Improved management of chemicals and waste, enhanced servicing sector; proper regulatory actions, and development of standard monitoring system for HPMP.	**Total resources required (USD)**	**5,356,014**
	Total resources approved in principle	Multilateral Fund: **5,356,014**

Agreed by (signatures):

Government	UNDP	Implementing Partner
Agreed by Government of the People's Republic of Bangladesh (ERD) Secretary Economic Relations Division Ministry of Finance	Resident Representative UNDP Bangladesh Country Office	Secretary Ministry of Environment, Forest and Climate Change
Date:	Date:	Date:

[1] Climate impact is calculated as per revised multilateral climate impact indicator (MCII) described at UNEP/OzL.Pro/ExCom/81/23 (2 June 2018)

I. DEVELOPMENT CHALLENGE

1. Bangladesh is a country of 147,570 Sq. km located in Southern Asia, bordering the Bay of Bengal, between Myanmar and India. The country has a population of 168.1 million (2018) of which 63% live in rural areas[2]. The key economic sectors are services (about 52.11% of the gross domestic product), industry (about 33.66% of the gross domestic product) and agriculture (about 14.23% of the gross domestic product)[3]. The GDP growth is 7.28% (2017) and 7.86% (2018). Bangladesh aspires to become an upper-middle class income country by growing its gross domestic product (GDP) at 7 to 8% per year in the next decade. Bangladesh has signed, ratified and/or accessed a good number of International Conventions, Treaties and Protocols (ICTPs) and Multilateral Environmental Agreement (MEA) and is active at the global, regional and national levels in the formulation of policies and strategies. Bangladesh has actively taken part in all international efforts to protect the environment. The country has been dynamically engaged in all the stages of discussion, decision, ratification and implementation of the Vienna Convention for the protection of Ozone layer, Montreal Protocol for Ozone Depleting Substances (ODS) phase out and related follow ups and protocols. The dates of the ratification of the various protocols related to the environment by Bangladesh are provided in Table 1.

Table 1: Montreal Protocol and its amendments

Agreement	Ratification Date
Vienna Convention	02.08.1990
Montreal Protocol	02.08.1990
London Amendment	18.03.1994
Copenhagen Amendment	02.11.2000
Montreal Amendment	27.07.2001
Beijing Amendment	24.08.2010
Kigali Amendment	in process

In compliance with the Montreal Protocol Schedule, Bangladesh implemented the country program incorporating noteworthy national strategies and action plans to phase out the ODS. The country has developed an extensive environmental framework of laws, concepts, strategies, programs and plans to cover all major environmental areas at the policy level. The National Ozone Unit (NOU), under the Department of Environment (DoE) Bangladesh, has overall responsibility for implementation of the Montreal Protocol in the country. This unit has been operational since 1995 under the Department of Environment, the Ministry of Environment, Forest and Climate Change. The Ozone Depleting Substances (Control) Rules promulgated in 2004 is the basis for the control of trade in ODS including HCFCs and were amended in September 2014 to align with the HCFCs phase-out schedule of Bangladesh.

I.1 Status of Stage I of HCFC Phase-Out Management Plan for Bangladesh

2. To meet a 10% reduction of HCFC consumption by 2015, Bangladesh submitted HCFC phase-out Management Plan (HPMP Stage-I) to the 65th Meeting of the ExCom of the Multilateral Fund in 2011 and was approved at a total cost of US$ 1,556,074, with a UNDP component for US$ 1,201,074, which included one stand-alone project (BGD/FOA/62/INV/38) approved at the 62nd ExCom meeting to convert HCFC 141b to cyclopentane in one refrigeration foam manufacturing company, at the total cost of US$ 1,146,074, and US$ 55,000 for soft activities which include HCFC consumption monitoring, enforcement to combat illegal and fake refrigerants, HCFC consumption verification and project closure activities. HPMP Stage-I for Bangladesh aimed to phase out 24.53

[2]National Adaptation Plan Process in Focus: Lessons from Bangladesh

[3]Gross Domestic Product (GDP) of Bangladesh (Final) 2017-18

ODP tonnes, of which 20.20 ODP tonnes of HCFC-141b were from the polyurethane (PU) foam conversion projects, 4.33 ODP tonnes of HCFCs (HCFC-22; HCFC-142b, HCFC-123 and HCFC-124) used in commercial blends in the refrigeration servicing sector, during the 2011-2018 period. An overview of the HCFC Phase-out schedule is provided in Table 2.

Table 2: Bangladesh HCFC phase-out schedule as per Decision19/6

Goals	Allowable Consumption (ODP tonnes)
Baseline	**72.65**
Freeze	**72.65**
10% reduction by 2015	65.39
35% reduction by 2020	47.22
67.5% reduction by 2025	23.61
97.5% reduction by 2030	1.816
2.5% annual average 2030-2040	1.816

Status of the progress of the Implementation of the HPMP Stage - I

3. *Legal and Policy Framework*: In Bangladesh, the total established baseline (average of 2009-2010) consumption of HCFC-141b (pure) was 21.23 ODP tonnes, out of which 20.20 ODP tonnes of consumption was by Walton Hi-Tech Industries Limited. In 2010, an individual project was approved at the 62nd ExCom meeting for Walton at the cost of US$1,146,074 to phase-out 20.20 ODP tonnes of HCFC-141b. The import of pure bulk HCFC-141b was prohibited following the completion of the project "Conversion from HCFC-141b to cyclopentane technology in manufacturing refrigeration equipment insulation foam at Walton Hi-Tech Industries Limited". The Ozone Depleting Substances (Control) Rules 2004 were amended in September 2014 to align with the HCFCs phase-out schedule of Bangladesh.

4. *Licensing and Quota Systems for HCFCs*: The license and quota system are fully operational since 2013. A license is required to import HCFCs. Importers are required to report to the NOU on the utilization of their respective licenses by the end of the calendar year. The exports of recovered and/or recycled ODS are permitted by applying for the export permission. Only licensed organizations can store and distribute ODSs in Bangladesh. Distributors must register their names with the NOU at the DoE. The NOU has established a quota system that includes all HCFCs indicated in the Annex C-Group I of the Montreal Protocol. The quota cycle runs in Bangladesh from January to December each year. The import quotas are distributed based on the importers' previous imports along with their current demands. The NOU retains 30% of the total quotas up to June, which along with unutilized quotas, are re-distributed in the month of July by evaluating the actual utilization of the importers' licenses issued for imports. 2-3% of the quotas are retained by the NOU as a buffer in case of emergencies or unexpected events.

5. *Conversion of one Polyurethane (PU) Foam Manufacturer* (project BGD/FOA/62/INV/38): The beneficiary company, Walton Hi-Tech Industries Limited, consumed almost 95% of the total consumption of pure, bulk HCFC-141b. The Government proposed an individual project phasing out of HCFC-141b from the foam sector for Walton in 2010. The project has been successfully completed, and the enterprise has converted from HCFC-141b to cyclopentane (C_5H_{10}) as blowing agent for insulation foam in its manufacturing of domestic refrigerators. The final verification of project completion was completed in May 2014. Through this project, 183.64 metric tonnes (20.2 ODP tonnes) of HCFC-141b was phased-out.

6. The Stage I of HPMP is operationally completed by 31 March 2019. The project completion report was submitted to the 83rd meeting of the Executive Committee held in May 2019.

I.2 HPMP Stage-II Preparation in Bangladesh

7. The HCFCs Phase-Out Plan for Bangladesh will, in principle, result in a staged approach implementation of HPMP: Stage I (2011-2018); Stage II (2019-2025); and Stage III (2026-onwards). Stage II is proposed to achieve a 67.5% reduction target of the baseline HCFCs consumption by 2025. UNDP and UN Environment assisted Bangladesh to prepare its HPMP Stage-II for compliance with the 2025 targets, with the financial support from MLF.

8. The HPMP Stage II proposal for Bangladesh, upon government endorsement, was submitted for consideration at the 81st Meeting of the Executive Committee dated 18 - 22 June 2018 and the proposal was approved at the meeting (UNEP/OzL.Pro/ExCom/81/58). The funding was approved by the Executive Committee with the following condition:

"Approved in accordance with the Agreement between the Government and the Executive Committee for the period 2018 to 2025 to reduce HCFC consumption by 67.5 per cent of the baseline by 2025. Noted the commitment of the Government to reduce HCFC consumption by 67.5 per cent of the baseline by 2025; and to issue a ban on manufacture and import of HCFC-22 based air-conditioners with cooling capacity up to 1.5 TR by 1 January 2024. The Government, UNDP and UNEP were requested to deduct 24.01 ODP tons of HCFCs from the remaining HCFC consumption eligible for funding."

9. The historical HCFCs consumption per substance for the last decade (2008 – 2017 Article 7 data) in Bangladesh are provided in Table 3.

Table 3: Historical HCFCs consumption per substance (ODP tonnes)

Substance	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*	Baseline
HCFC-22	50.88	46.69	44.16	58.11	57.95	57.42	57.63	63.62	63.27	62.43	45.42
HCFC-141b**	13.2	20.9	21.56	21.78	5.50	4.40	-	-	-	-	21.23
HCFC-142b	-	-	11.44	8.16	2.88	2.93	1.67	0.42	0.41	0.39	5.72
HCFC-123	0.12	0.16	0.25	0.30	0.14	0.14	0.06	0.14	0.22	0.14	0.21
HCFC-124	-	-	0.13	0.07	-	-	-	-	-	-	0.07
Total	64.20	67.75	77.54	88.42	66.47	64.89	59.37	64.18	63.90	62.96	72.65
HCFC-141b (pre-blended polyol) ***	NA*	-	-	-	20.9	5.5	12.1	15.4	16.5	18.92	-
Total (with HCFC-141b used in polyol)	64.20	67.75	77.54	88.42	87.37	70.39	71.47	79.58	80.40	81.88	

* Source*: Country Program data 2017* ** Bulk (pure) substance, *** Substance pre-blended in polyol

Furthermore, an in-detail sectoral distribution of HCFCs in Bangladesh for the year 2017 is provided in Table 4.

Table-4: Sector wise HCFC consumption in 2017

Sector	Substances	HCFC use			
		ODP tonnes	ODP tonnes (%)	MT	MT (%)
RAC Manufacturing	HCFC-22	26.29	41.75	478	41.64
	HCFC-123	0.02	0.03	1	0.08
RAC Servicing	HCFC-22	36.14	57.40	657	57.24
	HCFC-123	0.09	0.15	4.1	0.36
	HCFC-142b	0.39	0.62	6	0.53
Fire Extinguishers	HCFC-123	0.03	0.05	1.7	0.15
Total		62.96	100	1,147.8	100
Polyurethane Foam Manufacturing	HCFC-141b (imported pre-blended polyol)	18.92		172	
Total		**81.88**		**1,319.8**	

Source: *Country Program data 2017*

10. With implementation of HPMP stage -I, Bangladesh has reduced 24.53 ODP ton of HCFCs consumption and is on track for a 30% reduction of HCFCs by 2018. The country proposes to reduce the additional eligible 24.01 ODP ton in HPMP stage II with MLF funding, while the remaining 24.11 ODP ton consumption of HCFCs will be eligible for future funding. The overall data on baseline of HCFCs consumption, HCFCs consumption reduction in Stage I, proposed amount reduction in HPMP stage-II and remaining amount for future funding for Bangladesh is shown in Table 5 below. From the Table 4 above, it can be found that RAC manufacturing sector represents 41.78%, the servicing sector represents 58.17% and fire extinguisher represents 0.05% of total HCFC

consumption measured in ODP ton. With the implementation of HPMP stage II, it is expected that 24.01 ODP ton of HCFCs will be phased out, consisting of 18.86 ODP ton of HCFC-22 (17.09 ODP ton used in manufacturing domestic and commercial air-conditioners by UNDP and remaining HCFC-22 1.77 ODP ton from RAC servicing), and 5.15 ODP ton of HCFC-141b from service sector.

11. An overview of the remaining HCFC consumption eligible for funding in ODP ton after Stage-I of HPMP of Bangladesh is presented in Table 5 below.

Table-5: Remaining HCFC consumption eligible for funding after Stage I of HPMP of Bangladesh

Substance	Starting Point	Reduction in Stage I	Remaining after Stage I	Reduction in stage II	Remaining Consumption
HCFC-22	825.82	63.27	762.55	342.91	419.64
HCFC-123	10.50	10.50	0.00	0.00	0.00
HCFC-124	3.18	3.18	0.00	0.00	0.00
HCFC-141b	193.00	183.64	9.36	0.00	9.36
HCFC-142b	88.00	8.77	79.23	79.23	79.23
Sub-Total in metric tons (eligible for funding)	1,120.50	269.36	851.14	422.14	429.00
HCFC-141b (pre-blended polyol) #	0.00	0.00	0.00	109.54	0.00
HCFC-22	45.42	3.48	41.94	18.86	23.08
HCFC-123	0.21	0.21	0.00	0.00	0.00
HCFC-124	0.07	0.07	0.00	0.00	0.00
HCFC-141b**	21.23	20.20	1.03	0.00	1.03
HCFC-142b	5.72	0.57	5.15	5.15	0.00
Sub-Total in ODP tons (eligible for funding)	72.65	24.53	48.12	24.01	24.11

Not reported in Stage I of the HPMP; in line with decision 61/47, it is not eligible for funding.

** Consumption of HCFC-141b is nil as the Government has imposed a ban on imported bulk HCFC-141b.

I.3 Development of proposal with suitable available alternatives technologies:

12. In HPMP stage-II, the focus is given on long-term environmental and occupational sustainability while selecting alternative substances and technologies. Thus, the selection of the alternative substances R-290 and R-32 was based on the Government's vehemently made decision and availability of refrigerants in the Asian market, despite the fact that both refrigerants fall under A3 and A2L category of flammability.

In addition, the technology selection is governed by the factors like-proven and reasonably mature technology, end-product properties and performance should be maintained, cost-effective conversion with minimal disruption of current manufacturing operations, compliance with established local and international standards for health safety and environment, reduce overall direct and indirect CO_2-equivalent emissions and implementable in a relatively short time frame. Currently, alternative substances and technologies that fully meet the above requirements are available, except higher capacity standalone commercial products.

As more scientific and technical information on alternative technologies and their environmental impacts, as well as information on research on new alternatives becomes available, it is clear that the eventual choice of alternative technology will need to carefully take into account environmental impacts and focus more on long-term environmental and occupational sustainability. This will need resources to be directed towards innovative products and processes that minimize ozone and climate impacts, while remaining efficient and affordable.

HPMP Stage-I implementation provided a lot of insight into technology choices for the foam sector, whereas HPMP Stage-II encompasses phasing-out HCFCs in five air-conditioners manufacturing companies and one chiller assembler. The technology choices should be cost-effectiveness, easily available and in addition, the implementation capability of the enterprises along with time required for implementation was considered during the development of proposal with suitable alternate technologies.

Thus, flammability and availability of HFC based technologies with high GWP are the factors that are currently unfavourable to wider adoption of substitute technologies. This constitutes a major challenge for reducing demands for HCFCs and thereby compliance with the HPMP Stage II targets.

I.4 Timeline for implementation:

13. The earliest date by which actual field activities of HPMP stage-II can commence is by September 2019 and will be completed as per agreement with the ExCom. This is to allow time for putting in place necessary project initiation procedures, agreements etc. This means that stringent timelines are likely to be encountered for implementing actions for Stage-II compliance. Adequate resources will be allocated, to support the additional costs of management, coordination and monitoring from PMU budget.

It is considered extremely important to engage and enlist the support of all stakeholders in the implementation of the HPMP Stage-II. To accomplish this, targeted awareness and capacity-building activities will be carried out. Accordingly, resources will be allocated to cover the costs of awareness and capacity-building actions.

II. STRATEGY

14. The project forms an integral component of HCFC Phase-out Strategy for Bangladesh and includes a plan for achieving Bangladesh's compliance targets of the Montreal Protocol. The project presents a plan to achieve the HCFC phase-out targets for Bangladesh in an accelerated manner for the period of 2018 to 2025.

II.1. HPMP Stage –II Overall Strategy

15. The Government of Bangladesh recognizes that the transition to sustainable and environment friendly technologies would lead to long-term social, environment and economic benefits for the sustainable development. The GoB also recognizes that the HCFC phase-out strategy needs to be designed so that the country can achieve the following:

a) Align the plan with relevant national development strategies, action plan and policies;
b) Achieve HCFC phase-out targets specified in Decision XIX/6 in a systematic manner;
c) Develop and demonstrate a strengthened and proactive partnership between government and industry;
d) Draw upon the lessons learned from the functioning of institutional arrangements and operational mechanisms, integrate and build upon existing infrastructures and introduce new mechanisms as needed;
e) Be dynamic, be open to evolving and be open to the revisions and adaptations as necessary in response to evolving situations; and
f) Ensure that there is the minimum risk of A3 and A2L refrigerant by engineering controls to save society and environment.

The GoB also recognizes that HCFC free alternatives in the market for some of the sub-sectors have high Global Warming Potential (GWP). In line with their national policy, the GoB aims to seek the long-term minimization/elimination of dependence on such substances wherever feasible and proposes a phase-out approach in adopting alternatives where low-GWP technology availability is limited.

Apart from the conversion of five air-conditioner manufacturer and one chiller assembler, the strategy would also look into widening the awareness, outreach, policy promotion, and capacity building to new stakeholders that are important to be included as part of the holistic approach to ensure and sustain long-term compliance. The focus of actions for subsequent stages will be on the phasing out of HCFCs among the remaining air-conditioners and small commercial refrigeration equipment manufacturers, as well as the servicing sector, in line with the subsequent control targets for HCFCs consumption. This will involve a) sustaining and strengthening infrastructures for effective and efficient management of HCFCs, and b) introducing and strengthening enforcement mechanisms.

II.2. HPMP Stage II Compliance Strategy

16. Under HPMP Stage II, the GoB envisages the adoption of non-ODS and low-GWP alternatives for the air-conditioning manufacturing and chiller sector. The GoB aims to reduce 422.14MT (24.01 ODP tons) of HCFCs by 2025 through the implementation of Stage II activities. The following plans are addressable for this project document:

a) Implement Stage II in an expedite manner, from HCFC-22 based technologies to lower GWP technologies: R290 in air-conditioners up to 1.5 TR; and R-32 in air-conditioner equipment larger than 1.5 TR

b) Adaptation of direct conversion from HCFC-22 to R290 and R-32 to maximize the environmental benefits of the phasing out of HCFC and leapfrogging as feasible to lower GWP options.

c) Implementation of well aligned HCFC policies that can help to curb demand for ODS and can foster the demand for low GWP and non-ODS alternatives.

II.3. HPMP Stage II Strategic issues

17. The key strategic issues for the implementation of the Stage II are as follows:

a) The availability of time to implement actions to achieve the objectives of Stage II (2019 to 2025) will introduce extraordinary management and coordination challenges for government and industry. The management and coordination of actions will need to be forward-looking, systematic, effective and efficient to ensure that implementation is approached consistently and, in a results,-oriented and coordinated manner.

b) Aiming for long-term sustainability of reduction in ODS use and creating stronger synergies with other national development policies related to skills development and sustainable economic growth, put more emphasis on institutionalizing the ODS free related capacity building activities for RAC manufacturing and servicing sector and trade control.

II.4. HPMP Stage II Implementation Strategy and Fund Allocation by the Multilateral Fund (MLF)

18. The overall fund flow from MLF for the implementation of the RAC manufacturing sector plans of the HPMP Stage II for Bangladesh to meet the targets for HCFC consumption for the period 2018-2025 are given in Table 6. It is notable that the RAC manufacturing sector plan will be implemented by UNDP as lead agency. To implement and monitor the plans a Project Management Unit (PMU) will be set up under the guidance of UNDP and the NOU of Bangladesh.

Table 6: HCFC consumption reduction targets and approved funds under of HPMP Stage-II Plan (Implemented by UNDP)

Sector Plan	Application	ODS	Mt (to be phased-out)	ODP t (to be phased-out)	C/E (US$/kg)	Funds Agreed (US$)
RAC Manufacturing	Conversion project for phase-out of HCFC-22 in six air-conditioner manufacturing enterprises	HCFC-22	310.78	17.09	15.83	4,919,666
Project Management Unit (Implementation and Monitoring)		n/a	n/a	n/a	n/a	436,348
GRAND TOTAL STAGE II			**310.78**	**17.09**	**15.83**	**5,356,014**

II.4.1. Air Conditioning Manufacturing Sector Plan

19. The room air conditioners and chillers are the largest consumers of R-22 in the RAC manufacturing sector, accounting for 75% of the total consumption in 2016. R-290 and R-32 have been selected as alternatives by the air-conditioner manufacturing companies. The chiller manufacturer will be converted to R-32 technology. The residential air conditioners will opt for R290 and R-32 based on the cooling capacity size. Despite the flammability challenge of R-290 (A3 - highly flammable), R-32 (A2L - mildly flammable) are emerging as a widely acceptable option for

adoption by many industry players across globe. GoB proposed after consultation workshops with industry and in view of the Kigali Amendment, that the industry should opt for R-290 for air-conditioners with less than 1.5 TR capacity, and R-32 low GWP refrigerant for the air-conditioners with higher capacity. The industry has agreed to such changes in the consultation stakeholders' meetings.

The HCFC phase-out strategy in the sector will comprise of the following industries with R-290 and R-32 conversion technology:

(a) Technology conversions in five (5) enterprises in room air-conditioning (for 6 production lines) AC Bazar Industry (one line), Walton Hi-Tech Industries Ltd (two lines), Supreme Air-conditioning (one line), Unitech Products (BD) Limited (one line), and Elite Hi-Tech Industries Ltd. (one line) and

(b) Technology conversions in one (1) enterprise Cooling Point Engineering Services (Chiller manufacturer)

This sector plan will be implemented as part of the overall HPMP Stage-II for Bangladesh. The DoE will coordinate the implementation. UNDP is the implementing agency for the RAC Manufacturing Sector. These conversions will result in a phase-out of 310.78 MT (17.09 ODP tonnes) of HCFC-22, comprising of 308.636 MT (16.97 ODP tonnes) in Room air-conditioning and 2.353 MT (0.13 ODP tonnes) in the Chillers. Detailed costs for conversion in each category of enterprises along with required information details are provided in the Annex I.

II.4.2. Project Monitoring Unit Plan

20. The National Ozone Unit of the Department of Environment of Bangladesh is responsible for the overall implementation of the Montreal Protocol in the country. NOU of DoE with the support of UNDP will establish and co-ordinate the PMU. The detail plans for the PMU is stated in paragraphs 38 - 41.

II.4.3 Regulatory actions

21. During HPMP Stage II, actions will be taken to promote the use of alternative technologies and limit the demand of virgin HCFCs, including changes in public procurement and building standards, setting of standards, and increasing awareness of stakeholders and the public.

II.5 Selection of companies

22. Department of Environment prepared "HCFC Phase-Out Management Plan (HPMP-Stage II) for Compliance with the 2020 and 2025 Control Targets for Annex-C, Group-I substances". They submitted it to the 81st ExCom Meeting of MLF. Cut-off date condition of ExCom MLF implies that R-22 conversion to R-290 and R-32 will be taken place only when the manufacturing company is established before 2007. According to the Agreement between the Government of Bangladesh and the Executive Committee of the Multilateral Fund for the reduction in consumption of Hydrochlorofluorocarbons in accordance with stage II of the HCFC Phase-out management plan, "*Any Enterprise to be converted to Non-HCFC technology included in the plan and that would be found to be ineligible under the policies of the Multilateral Fund (i.e. due to foreign ownership or establishment post the **21 September 2007 cut-off date**), would not receive financial assistance. This information would be reported as part of the Tranche Implementation Plan. (page 148, para 7).* HCFC 22 consumption and year of establishment of the companies are presented in Table 7.

Table 7: **AC manufacturing enterprises using HCFCs in Bangladesh**

SL No.	Name of Manufacturer	Date Found.	Main products	HCFC-22 consumption MT (2016)
1	Walton Hi Tech Industries Ltd	2006	Air-conditioners Window AC, split AC, inverter, cassette, ducted packaged units	222.14
2	Unitech Products (BD)	2000		15.13
3	Supreme Air-Conditioning Co.	2004		24.97
4	Elite Hitech	2003		21.46
5	AC Bazar Industries Ltd	2004		24.92
6	Cool Point Engineering	2002	Chillers	2.353

Source: p-29, para 49, HCFC Phase-Out Management Plan (HPMP Stage-Ii) for compliance with the 2020 and 2025 control targets for Annex-C, Group-I Substances

According to the above table it is found that 12.22 ODP ton HCFC-22 was consumed by Walton Hi Tech Industries Ltd. 0.83 ODP ton by Unitech Products (BD), 1.37 ODP ton by Supreme Air-Conditioning Co., 1.18 ODP ton by Elite Hitech, 1.37 ODP ton by AC Bazar Industries Ltd and 0.13 ODP ton by chiller manufacturer namely Cool Point Engineering. These 6 manufacturing companies were selected for this project HPMP Stage II based on the above condition of ExCom to phase out R-22 from their industries and convert it R-290 and R-32.

After numerous interactions with the industry, it was agreed during consultation workshops and individual meetings with beneficiaries and with the Government, the total contribution to **co-financing** by the industry will be accounted during the project implementation and reported back to the MLF. Source: p-41, para 104, HCFC Phase-Out Management Plan (HPMP Stage-Ii) For Compliance with the 2020 And 2025 Control Targets For Annex-C, Group-I Substances, Doe, 21 Mar 2018.

II.6 Relevance to the Sustainable Development Goals (SDGs)

23. The 17 Sustainable Development Goals (SDGs) were adopted in 2015 by the international community, including Bangladesh as part of the UN 2030 Agenda for Sustainable Development. The Linkage SDG with HPMP-II are given below in Tabl 8:

Table 8: **HPMP II project linkage with SDG**

Sustainable Development Goals (SDGs) and Targets		Linkage with HPMP-II Project
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all	7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries in accordance with their respective programmes of support	Upgraded technology will increase energy efficiency in 6 manufacturing plant
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high value added and labour-intensive sectors	Economic productivity will be increased through technological upgrading
Goal 9. Build resilient infrastructure, promote inclusive and sustainable	9.1: Develop quality, reliable, sustainable and resilient infrastructure to support economic development and human well-	Conversion of R-22 to R-290 and R-32 is a quality, reliable, sustainable

Sustainable Development Goals (SDGs) and Targets		Linkage with HPMP-II Project
industrialization and foster innovation	being, with a focus on affordable and equitable access for all.	technology as an affordable and equitable access.
Goal 12. Ensure sustainable consumption and production patterns	12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment. 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	35% of HCFC consumption will be reduced by 2020, 67.5% by 2025 and 97.5% by 2030 from the total.
Goal 13. Take urgent action to combat climate change and its impacts	13.2 Integrate climate change measures into national policies, strategies and planning	HPMP-II project will reduce greenhouse gas emissions from the 6 manufacturing companies

Compiled from *Transforming our World: the 2030 Agenda for Sustainable Development* (UN, 2015), *Indicators and a Monitoring Framework for the Sustainable Development* Goals, Sustainable Development Solutions Network (SDSN)

III. RESULTS AND PARTNERSHIPS

Expected Results

24. Successful implementation of the HPMP Stage II, Bangladesh will result in a sustainable phasing-out of 310.78 MT or 17.09 ODP ton of HCFC-22 (by investment projects). Due to the relatively high GWP of HCFCs used in Bangladesh, their phase-out will result in reduced direct and indirect GHG emissions. Table 9 presents the climate impact in the AC manufacturing sector, calculated with the revised multilateral climate impact indicator (MCII).

Table 9. Climate impact in the air-conditioning sector

Input	Note: All data displayed is specific to the case investigated and is not generic information about the performance of one alternative; performance can differ significantly depending on the case.		
	Generic		
	Country	[-]	**Bangladesh**
	Company data (name, location)	[-]	**Walton, AC Bazaar, Supreme, Elite, Unitech and Cooling Point**
	Select system type	[list]	Residential and commercial cooling
	General refrigeration information		
	HCFC to be replaced	[-]	HCFC-22
	Amount of refrigerant per unit	[kg]	1.09 to 5.18 per kg; average 1.14 kg
	No. of units	[-]	272,905
	Refrigeration capacity	[kW]	1 to 5 TR
	Selection of alternative with minimum environmental impact		
	Share of exports (all countries)	[%]	0
	Calculation of the climate impact		

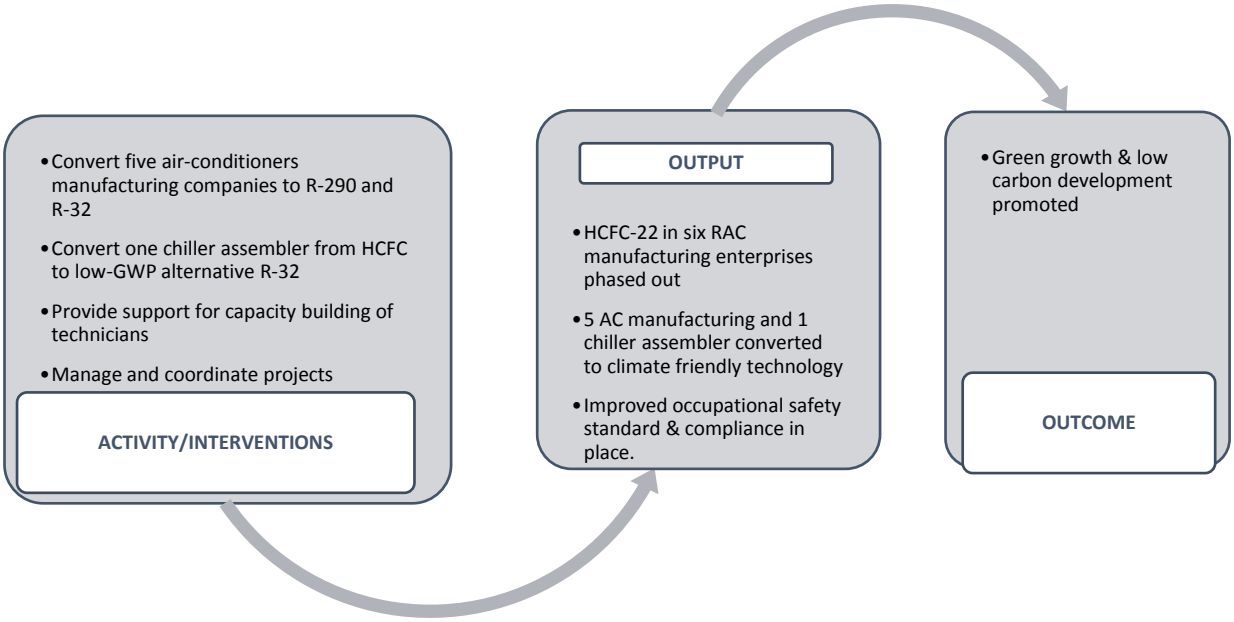
	Alternative refrigerant (more than one possible)	[list]	R-410A; HFC-32; HC-290
Output	*Note: The output is calculated as the climate impact of the refrigerant systems in their lifetime as compared to HCFC-22, on the basis of the amount produced within one year. Additional/different outputs are possible*		
	Country		
	Identification of the alternative technology with minimum climate impact		
	List of alternatives for identification of the one with minimum climate impact	[Sorted list, best = top (% deviation from HCFC)]	R-290 (-34 %)
			HFC-32 (-24 %)
			HCFC-22
			R-410A (+3%)
	Calculation of the climate impact		
	Per unit, over lifetime (for information only):		
	Energy consumption	[kWh]	296,193
	Direct climate impact (substance)	[kg CO_2 equiv]	813,811
	Indirect climate impact (energy): In country	[kg CO_2 equiv]	1,773,824
	Indirect climate impact (energy): Global average	[kg CO_2 equiv]	0
	Baseline climate impact before conversion		**2,587,635**
	Alternative refrigerant 1		**R-410A**
	*Total direct impact (post conversion – baseline)**	*[t CO_2 equiv]*	40,979
	*Indirect impact (country)***	*[t CO_2 equiv]*	26,096
	*Indirect impact (outside country)***	*[t CO_2 equiv]*	-
	Total indirect impact	*[t CO_2 equiv]*	26,096
	Total impact	**[t CO_2 equiv]**	**2,654,710**
	Alternative refrigerant 2		**HFC-32**
	*Total direct impact (post conversion – baseline)**	*[t CO_2 equiv]*	(543,442)
	*Indirect impact (country)***	*[t CO_2 equiv]*	(88,020)
	*Indirect impact (outside country)***	*[t CO_2 equiv]*	-
	Total indirect impact	*[t CO_2 equiv]*	(88,020)
	Total impact	**[t CO_2 equiv]**	**1,956,173**
	Alternative refrigerant 3		**HC-290**
	*Total direct impact (post conversion – baseline)**	*[t CO_2 equiv]*	(812,867)
	*Total indirect impact (country)***	*[t CO_2 equiv]*	(54,794)
	*Total indirect impact (outside country)***	*[t CO_2 equiv]*	-
	*Total indirect impact**	*[t CO_2 equiv]*	(54,794)
	Total impact	**[t CO_2 equiv]**	**1,719,975**
Source: MLF approved doc, UNEP/OzL Pro/ExCom/81/23, 2 Jun 2018			

*Direct impact: Different impact between alternative technology and HCFC technology for the substance-related emissions.
**Indirect impact: Difference in impact between alternative technology and HCFC technology for the energy-consumption-related emissions of CO_2 when generating electricity.

The replacement of HCFC-22 by R-290 and HFC-32 in the AC sector will result in avoiding the emissions of 1,719,975 mt CO_2-eq. (i.e. from the baseline of 2,587,635 mt CO_2-eq. emissions to 867,660 mt CO_2-eq.). Each kilogram (kg) of HCFC-22 not emitted due to better refrigeration practices results in the savings of approximately 1.8 mt CO_2-eq.

25. The HPMP Stage-II implementation will take into consideration safety and energy efficiency in line with national and international regulations and guidelines. A strong partnership would be established with private sector enterprises engaged in smooth and effective technology transfer.

All these outputs will ensure clean and green environment, develop a path-breaking framework for the country and contribute to Bangladesh's compliance with the control targets for Annex-C, Group-I substances (HCFCs) under the Montreal Protocol. These outputs are expected to contribute in achieving the following Country Programme.



Resources Required to Achieve the Expected Results

26. The HPMP Stage-II project has been approved by the ExCom of the MLF at its 81st meeting. The total funds approved for UNDP is US$ 5,356,014 and those funds would be received in multiple tranches from the year 2019-2025. These funds are to be used in RAC manufacturing sector for the conversion project for phase-out of HCFC-22 in six manufacturing enterprises and for the Project Management Unit (US$ 4,919,666 will be used for RAC manufacturing sector and US$ 436,348 will be for PMU). In addition to this, the project would have contribution-financially and in-kind from the industries and the GoB for implementing the project. The GoB, mainly the DoE, MoEFCC, this relates to time and resources for monitoring, guiding and implementation of different project components. After numerous interactions with the industries, it was agreed during consultation workshops and individual meetings with beneficiaries and with the Government, the total contribution to co-financing by the industry will be accounted during the project implementation and reported back to the MLF in the final project completion report. The detailed baseline data for the enterprises in all sectors along with the breakdown of cost of conversion is given in Annex I. It is mentionable that the country currently does not use R-290 and R-32, or the A3 and A2L category refrigerants in the manufacturing and servicing sectors as of now. The country has to develop a supply chain mechanism of refrigerants management, in addition to the manufacturing, installation, and servicing of equipment based on highly flammable substances.

The MLF for the Implementation of the Montreal Protocol provides incremental capital and operating costs to facilitate conversion from ODS to non-ODS and low GWP technology with zero ODP and low GWP value, to the HCFC consuming enterprises selected during the preparation of the project

proposal, following proper due diligence and the implementation framework for the project. The successful implementation of project by UNDP will result in the reduction of HCFCs consumption by 17.09 ODP tonnes by the year 2025 from RAC manufacturing sector.

27. For the HPMP Stage –II, to develop a roadmap for Legal and Policy framework, implementation action plans, set up of PMU and the outstanding coordination mechanism development as well as to assist the UNDP in managing the HPMP project, a national/international expert(s) will be required to hire. The following tasks will also be supported by consultants:

- Conduct Technical evaluation of all milestones met under the project;
- Verify the project deliverables are met;
- Preparation of Project Completion Report;
- Any other task as required by NOU/UNDP;

Partnerships

28. The project involves strong coordination needs among different stakeholders to achieve national targets of Bangladesh. The main stakeholders and their roles are given in Table -10:

Table 10: Stakeholders / Partners and their respective roles in the projects

Partnership	Roles
Department of Environment, Ministry of Environment, Forest and Climate Change	The Government is responsible for the achievement of overall project results. The Government has a binding agreement with the Executive Committee of the Multilateral Fund. The Government is also responsible, as a partner to UNDP, for project implementation, monitoring and reporting the results of phasing out of HCFCs. The National Ozone Unit of the DoE, MoEFCC is the Focal Point for Montreal Protocol activities and lead government agency for national policy development and project implementation related to Montreal Protocol.
Bangladesh Standards and Testing Institution, Ministry of Industry	Government agency for developing and issuance of standards and testing protocols.
Six Participating Industries	The six participating industries will be responsible for achieving their respective HCFCs phase-out targets under the overall guidance of the project. They will also implement some mandatory awareness program as part of their corporate social responsibility on environmental issue, sustainable consumption and production, occupational health and safety, etc. UNDP can provide required communication support to these six participating companies.
Industry Associations	Bangladesh Refrigerator Manufacturers and Exporters Association and Bangladesh Refrigeration & Air-Conditioning Merchants Association (BRAMA): to promote interest of the trades and manufacturers of RAC sector in Bangladesh. They would also play an important role in strengthening public-private partnership which is an important element for success of this project.
UNDP	As the lead implementing agency for this project, UNDP will be responsible for providing technical support and managing implementation of the project. UNDP will be responsible for the project reporting and independent verification of achievement of ODS phase-out targets under the Agreement.
UN Environment	HPMP stage II co-operating implementing agency for RAC service sector training, awareness activities, and custom training.

It is notable that all these will be engaged at various points during project initiation, implementation monitoring and other specific project activities. Their roles would be defined under specific project components.

Risks and Assumptions

29. The risk involved, level of risk, their possible impact and mitigation mechanism are stated in Table -11.

Table-11: List of risks and their management options

Risks	Risk level	Impact	Mitigating Mechanism
Time delay in HCFC free technologies development	Medium	High	(a) Close monitoring of technology development by the PMU in consultation with technical experts. (b) Regular consultations with industries on conversion to HCFC free technologies highlighting benefits of new technology options (c) Updates on regulations that would prohibit adoption of old HCFCs based technologies in advance (2-3 years). e) Production and distribution of communication materials, advertisement in newspaper/ TV/ Radio, short films, campaign in social media, etc.
Difficulties in adaptation of new technologies by Small enterprises	High	High	(a) Workshops and consultations with industries on HPMP Stage-II and providing technical support through hiring of international experts (b) Make available of the alternative refrigerants e.g., R-290. (c) Updates on regulations that would prohibit adoption of old HCFC and HFCs with high GWP based technologies and its impact on servicing applications. (d) Closer engagement and cooperation with large equipment manufacturers. (e) Industrial visit to other manufacturers under South-South cooperation for better understanding the conversion process
Proper control of outmoded HCFCs	Medium	Medium	The risk is localized and could be mitigated by proper containment. Recovery and recycling of the outmoded material.
Implementation delay (Operation) followed by reputational risks	Medium	Medium	a) GOB has successfully phased out the consumption of other Ozone depleting substances (ODS) e.g., Chlorofluorocarbons (CFCs) and Methyl Chloroform in line with the Montreal Protocol schedule. The lessons learnt from ODS phase out in the past would help in addressing the operational bottlenecks, if any. b) Sound implementation of framework, result-oriented and integrated approach will ensure timely and successful implementation.
Safety of industries with use of flammable technologies (Hydrocarbons)	High	High	a) Insecurity / risk associated in the RAC manufacturing and servicing sectors will be duly addressed and the pre-defined security measures will be taken appropriately. b) The due diligence by UNDP and occupational safety risks must be assessed proactively. c) Organize sector specific workshops on safety

Risks	Risk level	Impact	Mitigating Mechanism
Enforcement of regulatory framework	Low	Medium	a) Market will be properly regulated to control the import of fake refrigerants. b) Regular meetings of the National Ozone Committee with stakeholders is recommended to ensure cooperation by the institutions involved in consumption and import of HCFC and high GWP HFCs. c) Holistic approach (direct & indirect) of the conducive regulatory framework need to be considered with actual enforcement.

Detail off-line risk log are given in Annex V**.**

Stakeholder Engagement

30. The project will make an integrated coordination among Government, industries (being the intended beneficiaries), industry associations, regulatory bodies and the implementing agency (UNDP). The project stakeholder engagement and coordination are the foundation for systematic and sustainable HCFC phase-out. The roles and responsibilities of each stakeholder and how they would participate in the "network" as a part of project implementation has illustrated in "partnerships" section earlier (Table-8). However, the main actors to be involved in successful implementation of HPMP-II Phase-down are:

a) 6 enterprises in RAC sector that includes AC Bazar Industry, Walton Hi-Tech Industries Ltd., Supreme Air-conditioning Co., Unitech Products Ltd., Elite Hi-Tech Industries Ltd. and Cooling Point Engineering Services.
b) Government Counterparts as represented by the National Ozone Unit under the Department of Environment under the MoEFCC.
c) UNDP

The project is expected to be implemented with minimum disruption to business continuity and livelihood of different industry stakeholders. Through funding support and proper timeframe, systematic project implementation process and technology transfer, the project is expected to achieve HCFC phase-out targets with minimum cost to industry and consumer.

South-South and Triangular Cooperation (SSC/TrC)

31. Although the project does not cover South-South cooperation schemes in its design, will seek to identify opportunities for cooperation of this kind within the framework of the participation of the NOU in the South Asia Ozone Officers network. The project will also use data of international technical bodies like Technology and Economic Assessment Panel (TEAP), and its subsidiary bodies like the Refrigeration Technical Options Committee (RTOC) and other NGOs/industry bodies. The TEAP is the technology and economics advisory body to the Montreal Protocol Parties and is constituted by a pool of experts from developed and developing countries. Under South-South study tours will be organized for industries as and when required.

Knowledge

32. The project results (HCFCs phased out data) will be periodically reported to the Executive Committee as a requirement. Regular update of the database of import/export and in country consumption of ODSs and their alternatives will be taken into account which will be done by NOU, DoE, MOEFCC. The updated database will be cross checked with data sources from the Ministry of Commerce & Customs authorities and will be reported to the MLF secretariat.

In the air-conditioners manufacturing sector, on-site technical assistance and information outreach on new technologies, targeted workshops/meetings for providing information on HCFC free technologies will be provided. Required knowledge products will be produced and distributed to the

selected industries. These will provide opportunity to introduce environmentally friendly alternatives to ODS and high GWP refrigerants and their replacement guidance.

33. Promotion of alternative emerging technologies through industry roundtables and Ozone to Climate (O2C) Technology Roadshows, green procurement initiatives and awareness raising workshops in collaboration with the Central Procurement Training Unit (CPTU), NBR & customs, DoE, Bangladesh RAC industry, BRAMA, Universities and other identified organizations will actively be considered. Campaign on HCFCs phase-out and HCFCs alternatives will be designed that included production and distribution of printed materials (e.g. translation of technical materials in Bangla, newspaper ads, articles in journals, newspapers etc.) and through mass media (documentary for technicians) and social media e.g., Facebook, Twitter, LinkedIn, etc.. Message on alternatives with low global warming potential (GWP) as well as success stories of HCFC phase-out project will be published. The successful demonstration data and findings will be published in DoE and UNDP websites and journals.

34. Awareness-raising on the risk associated with storage of HC refrigerants particularly to commercial and industrial importers, RAC technicians and educate them on the safety issues related to handling such refrigerants. Public campaign on responsible consumption and production will be promoted by the project to encourage the purchase of green air conditioning. The use of environment friendly and energy efficient technology, safety and related issues will be promoted. Knowledge products, training and communication materials will be produced in the areas of occupational health and safety of workers and factory, environment friendly and energy efficient technology, operational guidelines, etc.

Sustainability and Scaling Up

35. The participating enterprises involved in the project implementation will be exposed and trained to non-HCFC technologies (A3 and A2L), through specially structured training and awareness workshops. This would, besides enhancing their competencies, also provide the requisite technical and financial (as agreed by MLF) support in conversion to non HCFC technology (R-290, R-32) and sustaining the phase-out of HCFCs under the project. Furthermore, the non-HCFCs products will bring an incredible opportunity for the enterprises as well as for the country to expand their international market with a limited impact on production costs and consumers. This would reflect a positive economic return on the industries and on the country, which will create enabling environment in the private sector to promote energy efficient and environment friendly RAC. Project will support conducive environment for accessing concessional financing for private sector to promote green growth.

Gender dimension

36. Project activities consist of conversion of technologies in targeted industries will take gender affirmative actions. The project team will promote the participation of women in various training, consultation meetings and will address gender inequalities in terms of active participation and decision-making process.

IV. PROJECT MANAGEMENT

Cost Efficiency and Effectiveness

37. The Multilateral Fund of the Montreal Protocol has developed Policies and Guidelines which include how funding is to be utilized for specific activities that have been approved, and agreement signed with the country. Stage-I of HPMP has been successfully implemented by UNDP Bangladesh and the same execution modality will continue. UNDP will use a portfolio management approach to improve cost effectiveness and efficiency through synergies with other development interventions.

Project Management

38. At the national level, the project will be overseen by the National Ozone Unit, a multi-stakeholder set-up of relevant national institutions and organizations. However highest decision-making body of the project will be the Project Steering Committee (PSC), consisting of representatives from MoEFCC, DoE, ERD, IMED, BSTI, Industry, and UNDP. National Ozone Unit will also be a member of it. The PSC will meet at least every six months, reviewing and adopting project annual work plans, progress updates while also making required coordination to further enhance project implementation. The committee will be chaired by Secretary, MoEFCC.

39. The project will be implemented by the National Ozone Unit within the Department of Environment. The NOU is responsible for overall management of MP programs, i.e. supervision of investment operations at the national level, which is done with the support of technical and administrative staff of NOU. The technical and administrative work will increase due to the significant phasing out of HCFCs in various sectors and sub-sectors. There will be more day-to-day work than during HPMP Stage I. The Lead agency and implementing agency also need to report their progress on a monthly/quarterly basis for the smooth implementation of the project. The project status will be updated on a periodic basis based on predefined formats and activities proposed under the HPMP. National Project Director of MP project will be appointed to oversee the implementation of HPMP Stage-II for better coordination of all MP activities.

40. A Project Management Unit (PMU) will be established at DoE during the implementation of HPMP Stage-II. PMU would put in place the necessary project coordination mechanism, initiation procedures, operational process, agreements, etc., the earliest date by which field-level activities can commences per project approval date. The PMU set-up is a key requirement to take on the technical and administrative work of Stage II activities. PMU would act as the project implementation arm of the National Ozone Unit and would focus on but not limited to the following:

- Planning of activities under each sub-component for the HPMP in line with the approved overall project plan. The PMU will implement annual workplans by the NOU, DoE and UNDP.
- PMU would put in place the necessary coordination mechanism, project initiation procedures, procurement of goods and services, agreements, etc. The earliest date by which field-level activities can commence is as per project approval date.
- Before signing the agreement with project beneficiaries, the PMU, and associated experts would also undertake physical verification of all the units being considered for support under the HPMP Stage II. This means that stringent timelines will be encountered for implementing actions for Stage II compliance, including front-loading of many activities.
- Procurement of goods and services of the industries will be funded by the project with guidance and advisory support by the PMU and UNDP.
- Required advisory and technical support will be provided to participating industries by the PMU and UNDP during project implementation.
- Implementation of project activities associated with individual sub-components will be accomplished in close coordination with the participating industries, technical institutes, relevant Government agencies, PIC, NOU and other relevant stakeholders.
- Implementation of project activities e.g. training, recovery, reuse and retrofit initiatives, etc. will be closely coordinated with technical schools and industry associations.
- PMU will provide periodic reports on project implementation status to NOU and UNDP/UN Environment.
- Participating in inter-agency coordination meetings and relevant meetings with the Government and national stakeholders on HPMP activities.
- Identifying specific policy and regulatory and other interventions needed to achieve HCFC phase-out targets.

41. Before signing the agreement, the PMU, associating experts would also undertake physical verification of all the enterprises being considered for support under HPMP Stage-II. This means that stringent timelines will be encountered for implementing actions for Stage-II compliance, including front-loading of many activities. This will make the task of management and coordination of activities very challenging. Adequate resources would need to be allocated, to support the

additional costs of management, coordination and monitoring. The DoE and UNDP will closely monitor the implementation on a periodic basis as per the implementation framework. All efforts will be made to ensure timely implementation, leading towards a successful phase-out of HCFCs as per the commitments made in the agreement with the ExCom of the MLF. The PMU will hire dedicated staff to implement the HPMP stage -II. The implementation cost for PMU is provided in Table 10 below. DoE will be the lead executing agency. The detailed roles and responsibility of the DoE is discussed in Governance and Management Arrangements section (Section VIII). The approved project budget for the PMU, to be implemented over a timeframe from 2019 to 2025 is detailed below:

Table-12: Breakdown of activities and implementation cost for PMU

Particulars	Cost in US$
Project implementation and coordination	
Staff costs (3 staff members equivalent)	292,000.00
National stakeholder meetings (6)	21,900.00
Computers and office electronic equipment	7,000.00
Furniture and equipment	2,900.00
Stationery and printing	7,248.00
Communication costs	4,000.00
Operational costs and overheads	14,600.00
Project monitoring	
Site visits	30,000.00
Performance verification	28,400.00
Policies and regulations implementation	
Stakeholder meetings	21,000.00
Capacity building	
Government stakeholder training workshops	7,300.00
Total	**436,348.00**

V. RESULTS FRAMEWORK

Intended Outcome as stated in the UNDAF (2017 – 2020) /Bangladesh Programme Results and Resource Framework:
By 2020, Bangladesh together with their respective partners, enhance effective management of the natural and manmade environment, focusing on improved sustainability and increased resilience of vulnerable individuals and groups (Outcome 2)

Outcome indicators as stated in the Country Programme [or Global/Regional] Results and Resources Framework, including baseline and targets:

Indicator 1.2.3. Number of people benefiting from livelihoods strengthened through solutions for management of natural resources, ecosystem services, chemicals and waste (Baseline (2016): women: 11,799, men: 18,469, total: 30,268. Target (2020): women: 44,000, men: 66,000, total 110,000)
Indicator 1.3.1: Number of new development partnerships with funding for improved energy efficiency and/or sustainable energy solutions targeting underserved communities/groups and women (Baseline 2015: 1; Target 2020: 5)
Indicator 1.3.3.: Number of new partnership mechanisms with funding for sustainable management solutions of natural resources, ecosystem services, chemicals and waste at national and/or sub-national level (Baseline 2016: 5; Target 2020: 15)
Indicator 3.2.1. (Number of UNDP-backed policy instruments that support low carbon climate resilient economy in Bangladesh; Baseline 2016: 3 Target: 4
3.2.1 The Government has the capacity to set up regulatory and to implement a range of pro-poor, resilience-focused green economic initiatives. Indicator: Number of UNDP-backed policy instruments that support low carbon climate resilient economy in Bangladesh,

General Indicator: Volume (tons) of Ozone Depleting substances released; Baseline: 72.65 ODP tons. Targets: 17.09 ODP tons reduction

Applicable Output(s) from the UNDP Strategic Plan: Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy)

Project title and Atlas Project Number: (1) **HCFC Phase-Out Management Plan (HPMP Stage-II) For Compliance with the 2020 and 2025 Control Targets**

EXPECTED OUTPUTS	OUTPUT INDICATORS	DATA SOURCE	BASELINE		TARGETS (ODP tonnes to be phased-out)								DATA COLLECTION METHODS & RISKS
			Value	Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Final	
Output 1 Phase out of HCFC-22 in six RAC manufacturing enterprises	***1.1. Implementation of work plan comprising:*** □ Overall activity Schedule □ Plant re-layout drawings if applicable for modifications □ Technical specifications of redesigned products	NOU/ Respective Industries/ UNDP	50.86	2018	-	-	-	-	16.72	0.63	-	Total 27.25 ODP tonnes will be phased out through implementation of HPMP-II as per agreement.	Data from NOU Risk Free

	1.2 Plant and process modifications comprising: □ Issuance of purchase orders /contracts for major equipment and/or modifications thereof				X							Out of 27.25 ODP Tonnes **17.09 ODP** tonnes will be phased out through the activities undertaken by UNDP. (a total of 17.09 ODP Tonnes phase-out i.e., 310.78 MT HCFCs phased out. The break-up is as: a) AC Bazar:1.36, Walton: 12.22, Supreme:1.37, Elite:1.18, Unitech: 0.83, and Cool Point: 0.13 ODP Tonnes)	Report/PO/ Contract Document/ field visit Risk Free
	1.3 Installation comprising of: □ Installation of equipment □ Completion of civil, electrical & mechanical works □ Completion of prototype manufacturing □ Safety audit by independent third-party auditor and □ training to RAC technicians/workers on safe manufacturing, installation and operations												Field visits and reports/ Safety audit report Risk Free
	1.4 Production Trail and commissioning comprising of: □ Product testing and performance report □ Trial production □ Training of technicians and plant personnel on new technology □ Production Certification, Verification and Commercial production												Field visits and training reports, Production reports Risk Free
Output 2: Project management and co-ordination	2.1 Number of progress report	UNDP/UNEP/NOU	0	2018	-	1	-	1	-	-	1	3	Data collection from UNDP/UNEP and NOU Risk Free
	2.2 Number of verification report	UNDP	0	2018	-	1	-	1	-	-	1	3	Data collection from NOU, Custom, and Importers Risk Free

VI. MONITORING AND EVALUATION

In accordance with UNDP's programming policies and procedures, the project will be monitored through the following monitoring and evaluation plans: *[Note: monitoring and evaluation plans should be adapted to project context, as needed]*

Monitoring Plan

Monitoring Activity	Purpose	Frequency	Expected Action	Partners (if joint)	Cost (if any)
Track results progress	Project progress report for implementation to be submitted to the executive Committee of the Montreal Protocol	Along with each request for tranche	Based on specific guidance from the Executive Committee, actions will be taken by the NOU for strengthening the project implementation	UNDP & NOU	n/a
Monitor and Manage Risk	Technology development risks	Annually	Close monitoring and share information with Industry. Provision of experts if required	UNDP, NOU, Technical Experts, Industry	M&E cost
	Project partner coordination and cooperation risks	Bi-yearly (if need be quarterly)	Close monitoring using project management team. Refer to risk log	UNDP & NOU	n/a
	Policy and regulations development risk	Annually	Intimate with the Project management team and partners and senior government officials on implementation of regulations in a timely manner	UNDP & NOU	n/a
Knowledge sharing	Knowledge, good practices and lessons will be captured regularly, and actively sourced from other projects and partners and integrated back into the project.	At least annually	Relevant lessons are captured by the project team and used to inform management decisions.	UNDP & NOU	n/a
Annual Project Quality Assurance	The quality of the project will be assessed against UNDP's quality standards to identify project strengths and weaknesses and to inform management decision making to improve the project.	Annually	Areas of strength and weakness will be reviewed by project management and used to inform decisions to improve project performance.	UNDP & NOU	DPC

Review and Make Course Corrections	Internal review of data and evidence from all monitoring actions to inform decision making.	At least annually	Performance data, risks, lessons and quality will be discussed by the PSC and used to make course corrections.	UNDP & NOU	n/a
Project Report	A progress report will be presented to the Project Steering Committee and key stakeholders, consisting of progress data showing the results achieved against pre-defined annual targets at the output level, the annual project quality rating summary, an updated risk long with mitigation measures, and any evaluation or review reports prepared over the period.	Annually, and at the end of the project (final report)	The progress report will be reviewed based on the comments received from the MP bodies and UNDP management as well as the Government national focal points	PMU, UNDP & NOU	PMU budget
Project Review (PSC)	The project's governance mechanism (i.e., PSC) will hold regular project reviews to assess the performance of the project and review the Multi-Year Work Plan to ensure realistic budgeting over the life of the project. In the project's final year, the PSC shall hold an end-of project review to capture lessons learned and discuss opportunities for scaling up and to socialize project results and lessons learned with relevant audiences.	Specify frequency (i.e., at least annually)	Any quality concerns or slower than expected progress should be discussed by the PSC and management actions agreed to address the issues identified.	UNDP & NOU	n/a

Evaluation Plan

Evaluation Title	Partners (if joint)	Related Strategic Plan Output	UNDAF/CPD Outcome	Planned Completion Date	Key Evaluation Stakeholders	Cost and Source of Funding
Project verification	UNDP/DoE	The HCFCs consumption is within the prescribed limits as mentioned in Appendix 2-A row 1.2 and the country is within compliance. Independent verification report of achievement of annual national consumption targets	Sustainable and resilient development	In accordance with the HPMP Agreement between the Executive Committee of the Multilateral Fund and the Government of Bangladesh, Performance verification will need to be carried out for each year for which national level consumption targets are stipulated and a tranche release is requested. This would apply to the national consumption level of 2018, 2019, 2020, 2021, 2022, 2023, 2024, and 2025	Executive Committee of Multilateral Fund/ Independent Consultant/UNDP/NOU	US$ 28,400 MLF (PMU budget)

VII. MULTI-YEAR WORK PLAN [4,5]

All anticipated programmatic and operational costs to support the project, including development effectiveness and implementation support arrangements, need to be identified, estimated and fully costed in the project budget under the relevant output(s). This includes activities that directly support the project, such as communication, human resources, procurement, finance, audit, policy advisory, quality assurance, reporting, management, etc. All services which are directly related to the project need to be disclosed transparently in the project document.

EXPECTED OUTPUTS	PLANNED ACTIVITIES	Planned Budget by Year (US$)								RESPONSIBLE PARTY	PLANNED BUDGET		
		2018	2019	2020	2021	2022	2023	2024	2025		Funding Source	Budget Description	Amount US$
Output 1: Phasing out HCFC in line with Montreal Protocol control *Gender marker: Gen 0*	1.1 HCFC-22 phase out from AC Bazar Industry (one line)	-	53,466	213,864	104,772	104,772	77,875	-	-	NOU/UNDP	MLF (63030)	72100	554,749
	1.2 HCFC-22 phase out from Walton Hi-Tech Industries Ltd (two lines)	-	183,372	733,490	575,676	575,676	699,763	-	-	NOU/UNDP	MLF (63030)	72100	2,767,977
	1.3 HCFC-22 phase out from Supreme Air-conditioning (one line)	-	26,666	106,663	72,168	72,168	78,665	-	-	NOU/UNDP	MLF (63030)	72100	356,330
	1.4 HCFC-22 phase out from Unitech Products (BD) Limited (1 line)	-	53,466	213,863	89,670	89,670	47,669	-	-	NOU/UNDP	MLF (63030)	72100	494,338
	1.5 HCFC-22 phase out from Elite Hi-Tech Industries Ltd. (1 line)	-	39,128	156,512	81,981	81,981	67,602	-	-	NOU/UNDP	MLF (63030)	72100	427,204
	1.6 HCFC-22 phase out from Cooling Point Engineering Services (Chiller manufacturer)	-	7,370	29,480	12,781	12,781	7,412	-	-	NOU/UNDP	MLF (63030)	72100	69,824
	1.7 Technical Assistance												
	a. International Consultant	-	15,000	65,000	20,000	20,000	0			NOU/UNDP	MLF (63030)	71200	120,000
	b. travel	-	5,000	15,000	5,000	5,000	0			NOU/UNDP	MLF (63030)	71600	30,000
	c. training	-	5,105	20,000	10,000	10,000	3,000			NOU/UNDP	MLF (63030)	75700	48,105
	d. contractual services	-	5,000	20,419	11,886	11,886	1,948			NOU/UNDP	MLF (63030)	72100	51,139
	Total		393,573	1,574,291	983,934	983,934	983,934	-	-				4,919,666
												Sub-Total for Output 1	**4,919,666**

[4] Cost definitions and classifications for programme and development effectiveness costs to be charged to the project are defined in the Executive Board decision DP/2010/32

[5] Changes to a project budget affecting the scope (outputs), completion date, or total estimated project costs require a formal budget revision that must be signed by the PSC. In other cases, UNDP programme manager alone may sign the revision provided the other signatories have no objection. This procedure may be applied for example when the purpose of the revision is only to re-phase activities among years.

Output 2: Project management, co-ordination and evaluation	2.1 Project implementation and coordination												
	a. Project Manager (One number)	-	12,000	48,000	24,000	25,200	26,400	27,600	-	UNDP/DOE	MLF (63030)	71400	163,200
	b. Project Assistant (two numbers)	-	7,200	28,800	21,600	22,680	23,500	12,000	13,020	UNDP/DOE	MLF (63030)	71400	128,800
	c. Training/Workshop/Conference/ Stakeholder Meeting	-	2,000	8,000	2,500	2,500	-	5,000	1,900	UNDP/DOE	MLF (63030)	75700	21,900
	d. Computer & electronic equipment	-	-	-	3,500	-	-	3,500	-	UNDP/DOE	MLF (63030)	72800	7,000
	e. Equipment and furniture	-	1,200	4,800	-	-	-	-	-	UNDP/DOE	MLF (63030)	72200	6,000
	f. Stationery & printing	-	700	2,800	750	750	659	750	839	UNDP/DOE	MLF (63030)	72500	7,248
	g. Communication cost	-	-	-	750	750	500	1,000	1,000	UNDP/DOE	MLF (63030)	72400	4,000
	h. Miscellaneous expenses	-	1,508	6,031	1,000	1,000	500	1,000	461	UNDP/DOE	MLF (63030)	74500	11,500
												Sub Total Activity 2.1	**349,648**
	2.2 Project monitoring (including HCFC consumption verification)												
	a. Travel	-	3,500	14,000	2,500	2,500	1,000	4,000	2,500	UNDP/DOE	MLF (63030)	71600	30,000
	b. Local Consultants (2 numbers)	-	3,000	12,000	-	7,000	-	6,400	-	UNDP/DOE	MLF (63030)	71300	28,400
												Sub Total Activity 2.2	**58,400**
	2.3 Policies and regulations implementation												
	Training/Workshop/Conference/ Stakeholder Meeting	-	2,800	11,200	-	2,000	1,000	2,500	1,500	UNDP/DOE	MLF (63030)	75700	21,000
												Sub Total Activity 2.3	**21,000**
	2.4 Capacity building												
	Training/Workshop/Conference/ Stakeholder Meeting	-	1,000	4,000	-	-	-	2,300	-	UNDP/DOE	MLF (63030)	75700	7,300
												Sub Total Activity 2.4	**7,300**
	Sub Total Output 2		34,908	139,631	56,600	64,380	53,559	66,050	21,220				**436,348**
GRAND TOTAL													**US$ 5,356,014**

Annual Work Plan of Year 1 and Year 2

a) Project Management Unit

MLF REF NO.	BGD/PHA/81/TAS/49
AWARD ID	00112138
PROJECT ID	00117012
Project Title	HCFC phase-out management plan (stage II, first tranche) (project management unit)
Responsible Party	Department of Environment (DoE)
Modality	National Implementation Modality (NIM)

Output/Atlas Activity	Responsible Party	Funds	Donor	ATLAS Budget Account Code	ATLAS Budget Description	Amount Yr1 (USD)	Amount Yr2 (USD)	Total (USD)
Activity 1: Project implementation and coordination	UNDP	63030	MLF	71400	Project Manager	22,000	38,000	60,000
	UNDP	63030	MLF	71400	Project Assistant	2,000	34,000	36,000
	UNDP	63030	MLF	75700	Training/Workshop/Conference/ Stakeholder Meeting	2,000	8,000	10,000
	UNDP	63030	MLF	72200	Equipment and furniture	1,200	4,800	6,000
	UNDP/DOE	63030	MLF	72500	Stationery & other Office Supplies	700	2,800	3,500
	UNDP	63030	MLF	74500	Miscellaneous expenses	508	7,031	7,539
	Sub Total Output 1					**28,408**	**94,631**	**123,039**
Activity 2: Project monitoring	UNDP/DOE	63030	MLF	71600	Travel	1,500	16,000	17,500
	UNDP/DOE	63030	MLF	71300	Local Consultants	2,000	13,000	15,000
	Sub Total Output 2					**3,500**	**29,000**	**32,500**
Activity 3: Policies and regulations implementation	UNDP/DOE	63030	MLF	75700	Training/Workshop/Conference/ Stakeholder Meeting	2,000	12,000	14,000
	Sub Total Output 3					**2,000**	**12,000**	**14,000**
Activity 4: Capacity building	UNDP/DOE	63030	MLF	75700	Training/Workshop/Conference/ Stakeholder Meeting	1,000	4,000	5,000
	Sub Total Output 4					**1,000**	**4,000**	**5,000**
GRAND TOTAL						**34,908**	**139,631**	**174,539**

b) Air-conditioning Sector

MLF REF NO.	BGD/PHA/81/INV/51
AWARD ID	00112138
PROJECT ID	00110796
Project Title	HCFC phase-out management plan (stage II, 1st tranche), Air-conditioning Sector
Responsible Party	Department of Environment (DoE)
Modality	National Implementation Modality (NIM)

Output/Atlas Activity	Responsible Party	Funds	Donor	ATLAS Budget Account Code	ATLAS Budget Description	Amount in Yr1 (USD)	Amount in Yr2 (USD)	Total (USD)
Activity 1: Phaseout of HCFC-22 in six RAC manufacturing enterprises	DoE	63030	MLF	72100	Contractual Services - Companies	363,468	1,453,874	1,817,342
	UNDP	63030	MLF	71600	Travel	1,750	9,000	10,750
	UNDP	63030	MLF	71200	International Consultants (2 numbers)	13,605	56,395	70,000
	UNDP	63030	MLF	72100	Contractual Services - Companies	0	22,000	22,000
	DoE	63030	MLF	71600	Travel	1,250	9,250	10,500
	DoE	63030	MLF	72100	Contractual Services - Companies	2,500	12,774	15,274
	DoE	63030	MLF	75700	Training, Workshop and conferences	11,000	11,000	22,000
GRAND TOTAL						**393,573**	**1,574,293**	**1,967,866**

VIII. GOVERNANCE AND MANAGEMENT ARRANGEMENTS

42. The project will be implementing following UNDP's National Implementation Modality (NIM). As Multilateral Implementing Entity (MIE), UNDP will be responsible for independent project oversight and implementation support through specialized technical support services and quality assurance throughout the project funding cycle. UNDP provides a three-tier oversight and quality assurance roles, which will include: i) day-to-day oversight of project quality, timeliness and safeguard standards; ii) oversight of project completion; and iii) oversight of project accounting and reporting. This will ensure that appropriate project management milestones are managed and completed. Such oversight will be carried out by the UNDP Country Office in Bangladesh, the UNDP Montreal Protocol Unit/Chemicals in the Bangkok Regional Hub, and the UNDP Headquarters in New York.

43. The Executing Entity for this project will be the Department of Environment under the Ministry of Environment, Forest and Climate Change. The project will be executed in compliance with Government of Bangladesh and UNDP rules and regulations, policies and procedures, following the NIM/NEX guidelines/modalities. NOU under DoE will be responsible and accountable for the execution of the project, including ensuring that the objectives and components of the project are delivered, and for the effective use of project resources.

44. To assist with successfully delivering project outcomes and components, the following Responsible Parties will enter into agreements with DoE, MoEFCC:

The project implementation will be governed by a **Project Steering Committee** (PSC) which will consist of a group of representatives responsible for making consensus-based strategic, policy and management decisions for the project. The PSC will oversee the project implementation, review compliance with the GoB, UNDP and MLF requirements, and ensure the implementation of the management plan for the risks identified. The PSC will meet to discuss project progress and stakeholder performance in every six months or earlier if an urgent strategic decision is to be needed. The PSC will be comprised of relevant stakeholders with following due procedures of the Government of Bangladesh.

- **Secretary**, MoEFCC will chair the Project Steering Committee (PSC) who will provide overall policy guidance regarding the implementation of the project.
- A **Delivery Partner** representative will provide guidance regarding the technical feasibility of the project, compliance with development partners requirements and rules pertaining to the use of project resources. This role will be fulfilled by UNDP.
- A **Project Assurance Team** will provide project guidance and oversight. This role will be fulfilled by MoEFCC and UNDP.
- **Project Implementation Committee (PIC)** will provide technical and operational support to the PSC to ensure technical specification, standard and quality of project's development intervention. This committee will be headed by DG, DoE.
- **Project Beneficiaries** will be the Refrigeration and Air-condition Sectors, RAC manufacturing industries and servicing technician from the project intervention.
- A **Project Management Unit** will be responsible for the development and implementation of all the components of the project. The PMU will consist of:
    - A **National Project Director** will be nominated from DoE by MoEFCC, who will be responsible for the overall direction, strategic guidance and timely delivery of project outputs including activities of UN Environment. One National Project Director may be engaged for the implementation of all Montreal Protocol related projects for better coordination;
    - A **Project Manager**, in support of Government and NEX Modality, the Project Manager will be recruited by UNDP will manage the implementation and day-to-day operation of the project under the direct supervision of NPD and will be accountable to UNDP;
    - A **Technical Team (consultants)**, recruited by UNDP that will: i) develop technical standards and specification of goods and services; ii) provide technical support and guidance; iii) guide the implementation of social, gender, and environmental

safeguards plans; and iv) implement capacity-building, knowledge management and communications activities.

- A **PMU Staff (Operations Team)**, following established rules under NEX modality UNDP will manage finance, general administration, procurement, internal auditing and risk management functions of the project. This role involves: i) managing funds; ii) programme quality assurance; iii) fiduciary risk management; iv) procurement; and v) the timely delivery of financial and programme reports to MLF.

- **Other Representatives** which will include representatives from: i) Participating Private Companies Representative; ii) FBCCI; iii) Ministry of Industries; iv) Ministry of Finance; v) Ministry of Planning; vi) National Board of Revenue; vi) Universities and Research Institutes.

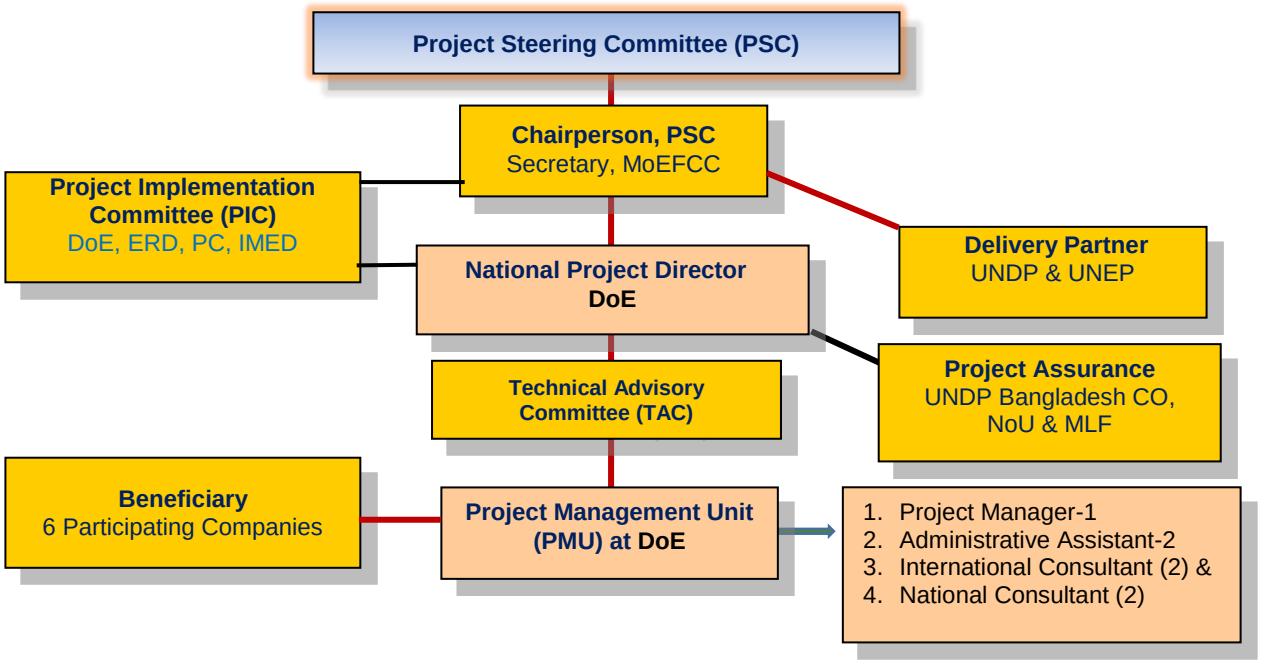


Figure 1. **Project Management Structure of HPMP-II**

Roles and responsibilities:

Project Steering Committee (PSC)

45. Project Governance will be through the PSC which will be convened by UNDP in consultation with the government and will serve as the project's governance and decision-making body. The PSC is responsible for making by consensus, management decisions when guidance is required by the Project Manager. In order to ensure UNDP's ultimate accountability, PSC decisions should be made in accordance with standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case a consensus cannot be reached within the PSC, final decision shall rest with the UNDP Management.

46. The PSC will comprise representatives of MoEFCC, National Focal Point for UNDP in Bangladesh, representation from Montreal Protocol (UNDP also act as representative of MP, the Senior Supplier of the project) and other entities as agreed between UNDP and the Government. The Project Manager (Head of NOU) will also attend in the PSC meetings. It will meet as necessary, but not less than once every 12 months, to review project progress, approve project work plans (including budgets) and approve major project deliverables. The PSC is responsible for ensuring that the project remains on course to deliver products of the required quality to meet the outcomes defined in the project document. Its role will include:

- Overseeing the project implementation;
- Approving all project work plans and budgets, as put forward by the NOU;
- Approving any major changes in project plans or programmes;

- Providing technical input and advice;
- Approving major project deliverables;
- Ensuring commitment of resources to support project implementation;
- Arbitrating any conflicts within the project and/or negotiating solutions between the project and any parties beyond the scope of the project; and
- Overall project evaluation.

The Ministry of Environment, Forest and Climate Change

47. MoEFCC will act as the Senior Beneficiary of the project. MoEFCC will appoint a high-level official who will serve as National Project Director (NPD) for the project. The NPD will be a senior person appointed to oversee the project who is accountable to the Government and UNDP for the implementation of the project in line with the signed project document. He/she is the approving officer for the project and will be responsible for providing government oversight and guidance for project implementation. The NPD will not be paid from project funds but will represent part of the government in-kind contribution to the project. Duties and responsibilities of the NPD during this project would be as below:

- Serves as a focal point for coordination of the project with implementing agencies, UNDP, Government and other partners;
- Ensures that Government inputs for the project are available and that the project activities are in line with national priorities;
- Leads and coordinates partners in the selection of the NOU;
- Coordinates with the NOU and facilitates its work and all staff;
- Ensures that the required project work plan is prepared & updated and distributed to the Government relevant entities when applicable;
- Will represent the National Executing Agency at project meetings and annual reviews;
- Will lead efforts to build partnerships for the support of outcomes indicated in the project document;
- Will support resource mobilization efforts to increase resources in cases where additional outputs and outcomes are required;

United Nations Development Programme:

48. UNDP will provide technical and policy backstopping to the project and will ensure coordination of project activities with the NOU/DoE/ MoEFCC and UNDP Country Office (CO) in Bangladesh. To ensure effectiveness and cost-efficiency of project implementation, the UNDP will be assigned as main executing /implementing agency for the project and will provide quality assurance to the project. The roles and responsibilities of UNDP during this project would be as below:

- Recruitment of PMU staffs and consultants as required;
- Procurement of goods and services;
- Support NOU/MoEFCC in ensuring an effective and smooth process in the project plans/ activities;
- Support NoU/ MoEFCC in review and endorsement process on the draft projects/plans/ activities, for timely finalization and submission to the ExCom;
- Assisting the Government of Bangladesh in preparation of project progress reports;
- Provide assistance with policy/regulatory, management and technical support to NoU as and when required;
- Assist NoU in the process of consultations with industries on the technical and logistical aspects;
- Provide assistance with policy, management and technical support when required;
- Assisting NoU/DoE and stakeholders on alternative technologies and technology transfer;

- Ensuring performance verification and disbursements in accordance with the HPMP agreement between the Executive Committee of the Multilateral Fund and Government of Bangladesh.
- Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the project, and accurate data reporting
- Ensuring that disbursements/compensation payments are made to technology supplier as well as equipment and material suppliers on agreed terms upon receipt of invoices which are properly substantiated;
- Ensuring that technical reviews undertaken by UNDP are carried out by appropriate independent technical experts, including the designation of an independent expert when required to verify that payment milestones have been achieved;
- Carrying out required supervision missions to monitor the delivery of the services included in this Project Document to the designated beneficiary;

Project Management Unit (PMU):

49. A PMU will be set up in the DoE, which will work closely with NOU. Under the overall supervision of the NPD, the PMU will be responsible for the implementation of the project which will include operational planning, monitoring, reporting, administrative, risk management and financial management. PMU will implement and coordinate both UNDP and UN Environment components of the HPMP Stage II. The PMU will also facilitate organizing the meeting of PSC and project implementation committee (PIC) for timely decision making and ensuring oversight on the project. UNDP as core quality assurance entity, will recruit PMU staff in consultation with the DoE.

The roles and responsibilities are listed as follows

- Technical, financial and operational management of the project;
- Monitoring and supervision of activities, including the monitoring of consumption;
- Executing performance-based agreements with enterprises participating in the HPMP for technology conversions and HCFC phase-out, and endorsing disbursements to the enterprises based on agreed performance targets;
- Ensure completion of company/enterprise level technology conversions and phase-out of HCFCs;
- Annual reports on consumption of substances to be submitted to the Ozone Secretariat;
- Coordination of review of policy/regulatory framework among related Government agencies;
- Validation of enterprise-level, sector-level and national-level baseline HCFC consumption data;
- Facilitate industry consultation;
- Communicate & disseminate public information and conduct awareness/outreach initiatives/programmes;

Implementing Entities

50. The investment component of the project will be implemented by the six selected companies who were identified by a study commissioned by the NOU of the Department of Environment. A Project Management Unit (PMU) will be set up in the Department of Environment to undertake implementation, coordination and monitoring responsibilities. A Memorandum of Agreement (MoA) will be established between UNDP and 6 beneficiaries to cover the conversion activities. UNDP will disburse funds based on milestones. A standard copy of MoA will be prepared during project implementation.

51. The MoA, which includes the Terms of Reference (ToR), for technology conversion, stipulated Milestones, Indicators and Payment Terms will be signed by the UNDP, with each of the six enterprises as per UNDP's rule. A performance-based payment and allocation will be jointly agreed with clear milestones that would form the basis for the PMU to effect payment. The UNDP will share the signed copy of the MoAs with DoE.

52. For the non-investment component of the projects, payments will be issued directly to suppliers of goods and services in line with UNDP procurement rules and regulations under support to NIM modality.

53. The recipients targeted in the project were identified for the HCFC-22 phase-out activities during the preparation phase of the project (2017-2018) and specifically through an national survey of the sectors validated by consultations; the results incorporated into a proposal were submitted to the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol and were approved in its 81st Executive Committee Meeting (which is the basis of this Project and Project Document – document annexed to the project document). The responsible parties are directly accountable to the implementing partner in accordance with the terms of their agreement. The recipient enterprises will receive the following agreed amount as per approved by MLF in the following formats as given in Table-13 which is includes ICC (incremental capital cost), IOC (incremental operational cost) and contingency.

Table 13: List of beneficiary enterprises and allocated funds*

Sl. No.	Beneficiary Enterprises	ICC (US$)	Contingency *	IOC (US$)	Total Cost (US$)
1	AC Bazar Industries Ltd.	399,000	35,650	155,749	590,399
2	Walton Hi-Tech Industries	1,368,450	132,345	1,399,526	2,900,321
3	Supreme Air-conditioning Co.	199,000	15,650	157,330	371,980
4	Elite Hi-Tech	292,000	24,950	135,204	452,154
5	Unitech Products	399,000	35,650	95,338	529,988
6	Cool Point Engineering	55,000	5,000	14,824	74,824
	TOTAL	**2,712,450**	**249,245**	**1,957,971**	**4,919,666**

* The contingency funds will be retained at UNDP/NOU for hiring International expert, organizing specific technical workshops and other related activities required for the safety of the industry during conversion process.

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IX. LEGAL CONTEXT AND RISK MANAGEMENT

LEGAL CONTEXT STANDARD CLAUSES

1. This project document shall be the instrument referred to as such in Article 1 of the Standard Basic Assistance Agreement[6] (SBAA) between the Government of Bangladesh and UNDP, signed on 25 November 1986. All references in the SBAA to "Executing Agency" shall be deemed to refer to "Implementing Partner."

RISK MANAGEMENT STANDARD CLAUSES

1. Consistent with the Article III of the SBAA *[or the Supplemental Provisions]*, the responsibility for the safety and security of the Implementing Partner and its personnel and property, and of UNDP's property in the Implementing Partner's custody, rests with the Implementing Partner. To this end, the Implementing Partner shall:
   a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
   b) assume all risks and liabilities related to the Implementing Partner's security, and the full implementation of the security plan.
2. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of the Implementing Partner's obligations under this Project Document [and the Project Cooperation Agreement between UNDP and the Implementing Partner]7.
3. The Implementing Partner agrees to undertake all reasonable efforts to ensure that no UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/sc/committees/1267/aq_sanctions_list.shtml. This provision must be included in all sub-contracts or sub-agreements entered into under/further to this Project Document.
4. Consistent with UNDP's Programme and Operations Policies and Procedures, social and environmental sustainability will be enhanced through application of the UNDP Social and Environmental Standards (http://www.undp.org/ses) and related Accountability Mechanism (http://www.undp.org/secu-srm).
5. The Implementing Partner shall: (a) conduct project and program-related activities in a manner consistent with the UNDP Social and Environmental Standards, (b) implement any management or mitigation plan prepared for the project or program to comply with such standards, and (c) engage in a constructive and timely manner to address any concerns and complaints raised through the Accountability Mechanism. UNDP will seek to ensure that communities and other project stakeholders are informed of and have access to the Accountability Mechanism.
6. All signatories to the Project Document shall cooperate in good faith with any exercise to evaluate any programme or project-related commitments or compliance with the UNDP Social and Environmental Standards. This includes providing access to project sites, relevant personnel, information, and documentation.

[66] http://www.bd.undp.org/content/dam/bangladesh/docs/LegalFramework/Standard_Basic_Framework_Agreement(SBBA).pdf

[7] Use bracketed text only when IP is an NGO/IGO

X. ANNEXES

Annex I RAC Manufacturing Sector Plan

Annex II Agreement between the Executive Committee and the Government of Bangladesh approved at the 81st ExCom meeting

Annex III Project Quality Assurance Report

Annex IV Social and Environmental Screening Template (SESP)

Annex V Risk Analysis

Annex VI ToR of Project Steering Committee (PSC) and Project Implementation Committee (PIC)

Annex VII ToR of PMU staff

Annex VIII Gender Action Plan

Annex IX Metrix of International and National Consultants

Annex X HCFC Phase out Management Plan (HPMP Stage II) for compliance with the 2020 and 2025 control targets for Annex-C, Group I substances, prepared and submitted by DoE to ExCom on 21 March 2018

Annex I

RAC MANUFACTURING SECTOR PLAN

NOTE: The submitted proposal to MLF is in BLACK font, whereas the approved proposal is in RED font.

PROJECT COVER SHEET

REFRIGERATION AND AIR CONDITIONING SECTOR PLAN, INVESTMENT PROJECTS

COUNTRY: Bangladesh

PROJECT TITLE	**IMPLEMENTING AGENCY**
HPMP Stage II - RAC Sector Plan	UNDP

NATIONAL CO-ORDINATING AGENCY: DoE

LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN THE HPMP DOCUMENT

A: COUNTRY PROGRAMME DATA - (2016, ODP TONNES)

HCFC-141B	**0**	**HCFC-123**	**0.22**
HCFC-142B	**0.41**	**HCFC-124**	**0**
HCFC-22	**63.27**	**HCFC-141B***	**16.5**

*****_substance contained in preblended polyols_

ODS USE AT ENTERPRISES		ODS kg	310.78	310.78
ODS TO BE PHASED OUT IN Stage II:		ODS kg	17.1	17.09
ODS TO BE PHASED IN		ODS kg	None	None
PROJECT DURATION:		Months	48	48
PROJECT COSTS:				
	Incremental Capital Cost	US$	5,994,150	2,961,695
	Incremental Operating Cost	US$	1,959,230	1,957,971
	Total Project Cost	US$	7,953,380	4,919,666
LOCAL OWNERSHIP:			100%	100%
EXPORT COMPONENT:			None	None
REQUESTED GRANT:		US$	7,953,380	4,919,666
IMPLEMENTING AGENCY SUPPORT COST (7%):		US$	556,737	374,921
TOTAL COST OF PROJECT TO MULTILATERAL FUND:		US$	8,510,117	5,294,587
COST-EFFECTIVENESS -		US$/kg ODS	25.58	US$/kg ODS 15.83
STATUS OF COUNTERPART FUNDING: **TOTAL CO-FUNDING PROVIDED BY COUNTERPAT**		n/a US$		- -
PROJECT MONITORING MILESTONES INCLUDED:		Yes		Yes

PROJECT SUMMARY

Under HPMP Stage II project, Bangladesh will convert its nationals manufactures of air conditioning and chillers units to zero-ODP/low-GWP refrigerants. The companies will be assisted in the manufacturing line conversion of air-conditioners and chillers, through financial and technology support. The related costs (ICC and IOC) cover equipment adaptations, trials, technical support and incremental operating costs for the duration of one year.

IMPACT OF THE PROJECT ON COUNTRY'S MONTREAL PROTOCOL OBLIGATIONS:

This project will eliminate 310.78 kg HCFC-22 equivalent to 17.09 ODP tons, which is 66% of Bangladesh´s consumption of HCFCs in RAC manufacturing sector, contributing to the reduction target for 2025.

A INTRODUCTION

1. The Government of Bangladesh has earmarked, for the Stage II of its HCFC phase-out compliance strategy through the 2025 consumption reduction target RAC manufacturing sector as one of the most important contributors. The Stage I of the HPMP for Bangladesh was approved by the Executive Committee at its 65th meeting at a total cost of USD 1,556,074, focusing on the Foam sector and RAC servicing sector by reducing 24.53 ODP tons of the substances HCFC-22, HCFC-142b, HCFC-123 and HCFC-124 contained in commercial blends.

2. However, HCFC-22 is used by Bangladesh and its consumption has grown substantially since it has not been addressed in HPMP Stage I.

3. Therefore, the Stage II RAC Sector Plan will assist the companies that manufacture air conditioning and chillers to non-HCFC-22 based equipment.

B. PROJECT OBJECTIVE

4. The objective of this project is to phase-out the use of HCFCs in the manufacture of air conditioning and chiller units, and in this way, contribute to Bangladesh´s compliance with pertinent Montreal Protocol HCFC phase-out obligations.

C. RAC MANUFACTURING SECTOR ANALYSIS

5. Bangladesh does not manufacture domestic and commercial refrigerators that based on HCFC-22 as refrigerant. However, Bangladesh has a relevant national industry that produces air conditioners: window units, splits (medium to large sized) and chillers for domestic use only. Six (6) companies are highlighted as having the largest share of HCFC-22 consumption, while other medium to small sized companies have small consumption of HCFC-22 and are not suitable to be assisted through individual projects, rather through group projects that focus on technical assistance in HPMP Stage III.

6. The enterprises in this sector manufacture air-conditioners with capacities ranging from 0.75 TR to 5 TR. The majority of units manufactured are below 1.5 TR capacity. 79% of the HCFC-22 consumption in the RAC manufacturing lies with the <1.5 TR air-conditioners, and only 21% of consumption belongs to >1.5 TR air-conditioners. It has been found that there is only one manufacturer of chillers of cooling capacity in the range from 3-5 TR range. The production is for hatchery industry, small units for the pharma industry and others. The quantum of refrigerant is charged within the range of 4 kg to 6 kg per unit. The total number of units assembled in 2016 was 405 units with a total of 2,353 kg of HCFC-22 consumption.

Table 1: AC manufacturing enterprises using HCFCs in Bangladesh

	Name of manufacturer	Date of establishment		Ownership non-Article 5	Main products	HCFC-22 consumption in 2016 (MT)	HCFC-22 consumption in 2016 (MT)	2nd conversion (yes/no)	Exports to non-Article 5 countries
1	Walton Hi Tech Industries Ltd.	2006		0%	Air-conditioners, Window AC, split AC, inverter, cassette, ducted packaged units	222.14	12.22	no	0
2	Unitech Products (BD)	2000		0%		15.13	0.83	no	0
3	Supreme Air-Conditioning Co.	2004		0%		24.97	1.37	no	0
4	Elite Hitech	2003		0%		21.46	1.18	no	0
5	AC Bazar Industries Ltd.	2004		0%		24.92	1.37	no	0
6	Cool Point Engineering	2002		0%	Chillers	2.353	0.13	no	0

D. PROJECT STRATEGY

7. The sector plan is composed of only six (6) eligible AC and Chillers Manufacturers, the companies were grouped in this sector plan, a "group project" composed by 6 individual projects approach is being taken in order to group the applications of the same company and achieve a global cost-effectiveness.

E. TECHNOLOGY OVERVIEW AND SELECTION

E.1. INTRODUCTION

8. To replace HCFCs in the production the AC Sector, following criteria ideally would apply:

- High COP,
- Non- flammable,
- Low toxicity,
- Zero ODP,
- Low GWP,
- Chemically/physically stable,
- Based on validated technology,
- Commercially available,
- Acceptable in handling
- Economically viable.
- Easiness for post-market handling (servicing)

9. No current replacement technology meets all these criteria and compromises will be necessary. The actual choice will be impacted under others, by application, technical proficiency, plant layout and investment as well as operating costs.

E.2. ALTERNATIVES

(a) **R-290** has zero ODP and a GWP of 3, with no toxicity and identical efficiency, good environment properties, and thermal properties. Given the large recharge amount in Air-Conditioning equipment, safety concerns can be resolved by engineering control, if R-290 is used in current technological conditions. The energy efficiency of air conditioning specially designed and manufactured for R290 can be 10% higher than the same equivalent type air conditioning with R-22 due to its excellent refrigeration performance. R290 is not only environmentally friendly, but also widely available, so R290 have drawn more and more attention as refrigerant. Italy's De' Longhi is producing portable RAC, dehumidifier and icemaker using R290, and their products are sold in Europe and Australia; Australia's Benson Air Conditioner company has already produced split RAC using R290 that product with a cooling capacity of 4KW can achieve energy efficiency above 3.05; Indian's Godrej has already sold nearly 200 thousand RAC based on R290 in India; Around 40,000 dehumidifier using R290 was sold in China and several tens of thousands portable AC using R290 was exported from China. Substantial growth of R290 products in China is expected.

(b) **R-32** has zero ODP and a GWP of 675. It has good thermal conductivity, a large refrigeration capacity, and high theoretical efficiency. Under the condition of equal refrigeration volume, the recharge volume of R-32 is 20% less that of R-22. R-32 is a mature and stable refrigerant which is easy and cheap to obtain. The exhaust temperature of R-32 System is relatively high and needs to be reduced by technological measures. R-32 is moderately flammable and requires a micro-combustion destructive test, risk evaluation, and measures to be taken to reduce the leak rate before being adopted for practical applications. As the greenhouse effect has become an issue of global concern, R-32 has received worldwide attention, given its lower GWP and sound refrigerating performance. It enjoys a promising future in terms of its possible applications. The Substitute Technology Expert Committee of India have conducted a comprehensive evaluation of various refrigerants taking into consideration various aspects, such as thermo-dynamic and physical properties, energy saving potential,

environmental protection, safety, and economy. R-32 has received common attention and appreciation in the process. From available analysis of R-32 applications, the results within a certain range of charge amount and certain product categories point to considerable potential and a promising future prospect.

(c) **R-134a** has zero ODP and a GWP of 1430. Inflammable, non-poisonous, and odourless, R-134a is safe to use in products such as Refrigerators, Freezers, and large Screw Chillers. The physical and thermodynamic properties of R-134a are significantly different from those of R-22. For these reasons, R-134a needs to use a different lubricant. It has a higher flow pressure drop and poorer heat transfer coefficient, and the unit refrigeration volume is 35% lower than that of R-22.

(d) **R-410A** has zero ODP and a GWP of 2100. It is an azeotrope mixture composed of 50% R-32 and 50% R-125. It has a large unit refrigeration volume, good heat transfer performance, and fluidity. R-410A is a popular substitute mainly used in small-sized or medium-sized Air-Conditioning equipment and some small types of Refrigeration equipment. Its working pressure is 60% higher than that of R-22, which leads to higher demand for system design, manufacture, and quality control. The price of R-410A is higher when compared to that of R22.

(e) **R-717** (ammonia, NH3) is classified as B2L. In principle, it has thermo-physical properties that lead to excellent efficiency. The vapour pressure and refrigerating capacity is similar to what can be found in HCFC-22. However, R-717 has a very high discharge temperature, so for lower temperature applications, two-stage-compression is normally needed. It is not practically compatible with copper and copper alloys, which limits the system to welded steel or aluminum components and piping. The application of R-717 in small to large absorption systems is also widespread.

(f) **R-744** (carbon dioxide, CO2) is classified as A1, and has thermo-physical properties that lead to good efficiency for certain levels of temperatures (such as for refrigeration range). The vapour pressure is several times greater than what is found in usual refrigerants, and the volumetric refrigerating capacity is correspondingly higher for conditions below 25°C. However, with a very low critical temperature, the cycle efficiency declines as the temperature before the expansion device increases and other features are needed to achieve similar (to HCFC-22) efficiency values at higher ambient conditions. Compared to a basic cycle, 10–20% energy efficiency improvement can be achieved by applying an ejector instead of an ordinary expansion device although using an expander alone can bring the efficiency to within 10% of HCFC-22. Other features to help improve efficiency in high ambient conditions include economizer (parallel compression), liquid-suction heat exchange, and mechanical sub-cooling. Also, discharge temperatures are very high and therefore, where the high temperature cannot be utilized, technology options such as additional compression stages and inter-cooling may be adopted in the system design. These additional features add to the complexity and cost of the system.

E.3. TECHNOLOGY CHOICE

10. The potential alternatives to HCFC-22 available for air-conditioning systems for residential and commercial applications include R32, R407C, R410A, R290 and HFO/HFC blends. R410A and R407C are used as the primary HCFC-22 replacements in AC systems on a global scale. In the recent past, use of R32 and R290 is growing in-spite of flammability due to being lower GWP refrigerants, especially in low charge split systems as well as window and portable AC systems. As indicated in various reports published by UNE, and by the Technology and Economic Assessment Panel (TEAP) of the Montreal Protocol, these alternative technologies can be used for various applications in the air-conditioning sector.

11. Based on the above technical considerations and previous comparison, AC industries of Bangladesh has chosen the following technologies:

a) Units with cooling capacity up to 1.5 TR : HC-290
b) Units with cooling capacity higher than 1.5 TR : HFC-32

F. PROJECT COSTS

F.1. INCREMENTAL CAPITAL COST

12. The total actual investment requested costs were US$ 5,994,150**,** however US$ 2,961,695 were approved. This includes a 10% contingency. Details are provided in the projects**.**

F.2. INCREMENTAL OPERATING COST

13. Incremental Operating Costs requested were US$ 2,961,695 however US$ 1,957,971 were approved for one-year. The calculation is detailed in the project descriptions.

F.3. COST EFFECTIVENESS (CE)

Table 2: Cost-effectiveness of the Program

Company	Consumption in 2016 (MT)	Funding request ($)	ICC ($)	IOC ($)	C/E (US$/kg ODS)
AC Bazar Industry	25	909,408	752,400	157,008	**25.58**
Walton Hi-Tech Industries Ltd	222	5,015,226	3,615,700	1,399,526	
Supreme Air-Conditioning Co.	25	662,230	504,900	157,330	
Unitech Products ltd	15	566,938	471,600	95,338	
Elite Hi-Tech Industries Ltd.	21.5	676,304	541,100	135,204	
Cooling Point Engineering Services	2.4	123,274	108,450	14,824	
Total	**310.9**	**7,953,380**	**5,994,150**	**1,959,230**	

Table 3: Cost-effectiveness of the Program

Company	Consumption in 2016 (MT)	Funding Approved ($)	ICC ($)	IOC ($)	C/E (US$/kg ODS)
AC Bazar Industry	25	590,399	434,650	155,749	15.83
Walton Hi-Tech Industries Ltd	222	2,900,321	1,500,795	1,399,526	
Supreme Air-Conditioning Co.	25	371,980	214,650	157,330	
Unitech Products ltd	15	529,988	434,650	95,338	
Elite Hi-Tech Industries Ltd.	21.5	452,154	316,950	135,204	
Cooling Point Engineering Services	2.4	74,824	60,000	14,824	
Total	**310.9**	**4,919,666**	**2,961,695**	**1,957,971**	

F.4 PROPOSED MULTILATERAL FUND GRANT

14. The proposed grant request were **US$ 7,953,380**. The approved grant for RAC manufacturing sector were US$ 4,919,695. Detail approved funds per enterprise (ICC and IOC) are mentioned in Table 3.

G. PROJECT IMPLEMENTATION AND MONITORING PLANS

ACTIVITY	QUARTERS																											
	Year 1				Year 2				Year 3				Year 4				Year 5				Year 6				Year 7			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MF Project approval	X																											
Project document signature		X	X	X																								
Equipment Review and Specifications				X	X																							
Procurement					X	X																						
Installation/retrofitting of equipment						X	X	X	X																			
Training									X	X																		
Testing and trials										X	X																	
Production Start-up												X	X	X	X													
Phase-In															X	X												
Project completed																												
PCR																												

Note: Implementation and Monitoring Plan for Year 4-7 will be updated during Year 4

MILESTONES FOR PROJECT MONITORING
(measured from project approval)

TASK	MONTH
(a) Project document submitted to beneficiary	2
(b) Project document signature	4
(c) Bids prepared and requested	5
(d) Contracts Awarded	7
(e) Equipment Delivered	15
(f) Training Testing and Trial Runs	18
(g) Commissioning	27
(h) Commercial Batches Testing and Improvement	36
(i) Completion	45
(j) PCR	48

H. PROJECT IMPACT

Direct Benefits: These projects will eliminate the use of 310.78 mt HCFC-22. The project employs commercially available and environmentally acceptable technology.

Environmental Impact: The allowable technologies have zero ODP and provide, in addition a considerable reduction in global warming potential as the following table shows:

SUBSTANCE	GWP[1]	INCREMENTAL GWP[2]
R-22	1,810	Baseline
R-290	Negligible	-1,810
R-32	675	-1,135

[1] Taken from IPCC's Fourth Assessment (2007)

[2] Derived from comparing GWPs compared to the baseline on an equimolar base. It should be noted that in practice formulators may make

changes such as increased water or ABA blends that impact the global warming effect

PROJECT

AC Bazar Industries Ltd.

Company Profile

Sl.	General information	
1	Name of Enterprise	AC Bazar Industries Ltd.
2	Name of Contact Person	Md. Jonab Ali
3	Designation of Contact Person	Chairman
4	Address	
	Head Office	Surma Tower (4th Floor) 59/2, Purana Palton, Dhaka-1000, Bangladesh
	Phone	01818016437, (88-02) 9513960
	Email	Jonabali_acbazar@yahoo.com
	Factory Office	Ruby Gate, Nasirabad 1/A, Chittagong
	Phone	(88-031)-258 4689
	Email	Jonabali_acbazar@yahoo.com
5	Date of establishment/ registration,	2004
6	Date of commencing production	2005
7	Ownership profile	Indigenous shareholding
8	Number of employees	Managerial- 20, Technical-58, Staff/ workers/ others - 980
9	Is any portion of the production exported?	No
10	Compliance with local environmental regulations	Yes
11	Category of industry	Medium
12	Manufacturing products	Window ACs, Split ACs, Inverted AC, Cassette, Ducted Packed system

Refrigerant Consumption

Year	HCFC-22, ODS kg
2014	17,043
2015	19,665
2016	24,922

PROJECT COSTS

The total actual investment costs requested were **US$ 752,400.** This includes a 10% contingency. Details of incremental capital costs are provided in the sub-projects. IOCs requested were US$ **157,008** for one year of operation. However, the approved cost of ICC and IOC are US$ 434,650 and US$ 155,749 respectively, which includes contingency cost, totaling US$ 590,399.

Manufacturing Process

The manufacturing process involves assembly process, leak test, and performance tests. The heat exchangers are cleaned internally with dry air/nitrogen. Sequentially, the sheet metal assembly is completed, heat exchangers are fitted, and compressor, fan motor, and electrical components are installed. Brazing is done to connect the mechanical refrigeration system. Post this the unit is tested for leakage using high pressure nitrogen/dry air and, after successful testing, is sent to evacuation and charging area. Before charging the refrigerant evacuation is completed to the level of 500 microns or less. In this process, After this step, the air-conditioner is again subjected to the leakage test, this time with the help of electronic leak detector. In case of leakage, cycle from pressure test onwards is repeated. Finally, the unit is subjected to performance tests and sent to packing and storage areas.

Baseline Equipment

Baseline Equipment	Equipment	Make	Quantity	Year of installation
Assembly Conveyors, feeding lines & related equipment	Outdoor unit conveyors line (up to 3 RT)	China	68 m	2005
	Indoor unit conveyors line	China	45 m	2005
	Outdoor unit conveyor line (more than 3 RT)	China	45 43 m	2010
Pressure Testing & Leak Detection	Nitrogen leak testing Leak detection machine	China	1 set	2005
Evacuation System	Vacuum Pumps (up to 3 RT)	Korea	4 sets	2005
	Vacuum Pumps (up to 3 RT)	China	1 set	2011
Gas Charging	Gas charging machine	China	2 sets	2005
Testing Equipment	Outdoor unit testing	China	8 sets	2005
	Low voltage testing machine	China	2 set	2005
Final leak detection	Leak detection machine	China	1 set	2005
Packing Equipment	Auto strapping machine	China	2	2005
Others	PCB testing	China	2	2005
Heat Exchanger Manufacturing Equipment	Auto cutting machine	China	1	2015
	Fin Press machine	China	1	2006
	Tube Straight and cutting machines	China	1	2006
	Testing Equipment	China	1	2006
	Tube expanders	China	1	2006

	Auto flaring machine	China	2	2007
	Manual cutting	China	4	2005
Sheet Metal Fabrication & Painting Line	Shearing Machines	China	1	2005
	Guage Meter	China	4	2007
	Spot welding	China	2	2006
	Top drill	China	1	2007
	Low Voltage Tester	China	5	2005 & 2014
	Oxygen Cylinder	China	3	2012
	Hydraulic press	China	1	2006
	Welding machine	China	1	2014
	Acetylene Cylinder	China	2	2015
	Multi spot welding machine	China	1	2006
	Nitrogen Cylinder	China	4	2008
	Auto screw driver	China	10 sets	2005
	Normal screw driver	China	10 sets	2005
	Weighting set	China	1	2005
	Combined pliers	China	3	2005
	Sly wrench	China	1	2005
	Ring wrench	China	2	2006
	Dull wrench	China	1	2008
	Ampere meter	China	1	2005
	AVO Meter	China	1	2005
	Air Flow meter	China	1	2005
	Gas charging machine	China	1	2005
	Outdoor unit testing	China	1	2005

Equipment Action

S. N.	Equipment	Proposed Action under the project
1	System, component and process redesign and prototype manufacturing and testing	Development, redesign
2	Heat exchanger processing modifications change to tube diameter to 5 mm	Change of moulds and dies, the vertical expander tools will be changed
3	Sheet metal processing modifications	The dies of will be replaced
4	Assembly line modifications	
	Mass flow Flammable refrigerant charging and supply station for R290	new procurement
	Mass flow Flammable refrigerant charging and supply station for R32	new procurement
	Safety system for Charging and supply area (one each)	new procurement
	Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr	new procurement
	Ultrasonic sealing machine	new procurement
	HC leak detector for R-290 and R-32 (one each)	new procurement
	Repair area accessories (like blow off unit for R290 and R-32) (one each)	new procurement
5	Civil and electric works for Installation, commissioning package	Retrofitting as per design and requirement
6	Quality inspection, finishing and testing modifications	-
7	Process, operation, maintenance and safety training	The training will be provided before the actual commercial production starts.
8	Technical assistance from external experts	Experts will be invited after the work plan is final.

Incremental Capital Costs and operational cost

RESIDENTIAL AIR-CONDITIONER (HC-290 up to 1.5 TR and HFC-32 >1.5TR) conversion				
COST CALCULATIONS				
No	**Item**	**Unit Cost (US $)**	**AC Bazar Industry**	
			Quantities	**Amount**
	Date of Establishment		**2004**	
	No. of Lines to be converted		1	
	No. of Units manufactured (2016) on the lines to be converted including units with >3TR		19,000	
	HCFC-22 consumption (kg)		24,922	
	Particulars		**Value in set**	
1	System, component and process redesign and prototype manufacturing and testing	18,000	3	54,000
2	Heat exchanger processing modifications change to tube diameter to 5 mm	200,000	1	200,000*
3	Sheet metal processing modifications:	25,000	1	25,000
4	Assembly line modifications			
	Massflow Flammable refrigerant charging and supply station for R290	80,000	1	80,000
	Massflow Flammable refrigerant charging and supply station for R32	60,000	1	60,000
	Safety system for Charging and supply area (one each)	77,000	1	77,000
	Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr	3,500	3	10,500
	Ultrasonic sealing machine	25,000	1	25,000
	HC leak detector for R-290 and R-32 (one each)	20,000	1	20,000
	Repair area accessories (like blow off unit for R290 and R-32) (one each)	7,500	1	7,500
	Civil and electric works for Installation, commissioning package	20,000	1	20,000
5	Quality inspection, finishing and testing modifications	15,000	1	15,000
6	Process, operation, maintenance and safety training	20,000	1	20,000
7	Technical assistance from external experts	30,000	1	30,000
8	Installation tools	2,000	20	40,000
Sub-total				**684,000**
Contingencies (10%)				**68,400**
Total (ICC)				**752,400**
Incremental Operating Costs				
No	**Item**			
1	Compressors	8.00	19,000	152,000
2	Heat exchangers (Additional cost due to high wall thick)	-2.08	19,000	39,520
3	Electrical and electronic PCB (Safety design)	7.60	19,000	144,400
4	Refrigerant - 65% less charge (average charge for 22 is 1.2 Kgs. and 0.35 kg of R290), the number of air-conditioners manufactured	-1.82	19,000	34,580
Total (IOC)				**222,300**
Total eligible IOC				**157,008**
Total eligible Costs				
No	**Item**			
1	Incremental Capital Costs			752,400
2	Incremental Operating Costs			157,008
Total funding request				**909,408**

*This is the funding to be requested from MLF, not the actual cost of heat exchange.

Total funds approved by MLF, combining the various heads under ICC and IOC

AC Bazaar							
		Total Number of AC manufacture	19,000				
		Total HCFC-22 consumption (in MT)	24.72				
Level		Industry Nomenclature	MLF Secretariat Nomenclature	Original Proposal			Negotiated final cost
				Unit Cost	Qty	Total Cost	
Investment - Conversion of Lines	1	System, component and process redesign and prototype manufacturing and testing	System and Product design	18,000	3	54,000	20,000
	2	Mass flow Flammable refrigerant charging and supply station for R290	Assembly Line for charging	80,000	1	80,000	80,500
		Mass flow Flammable refrigerant charging and supply station for R32		60,000	1	60,000	
		Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr.		3,500	3	10,500	
		Ultrasonic sealing machine		25,000	1	25,000	
		HC leak detector for R-290 and R-32 (one each)		20,000	1	20,000	
		Repair area accessories (like blow off unit for R290 and R-32) (one each)		7,500	1	7,500	
	3	Safety system for Charging and supply area (one each)	Storage & Supply System	77,000	1	77,000	45,000
	4	Civil and electric works for Installation, commissioning package	Quality Control, civil works and installation tools	20,000	1	20,000	11,000
		Quality inspection, finishing and testing modifications		15,000	1	15,000	
	5	Process, operation, maintenance and safety training	Technical Assistance, installation, training and safety verification	20,000	1	20,000	42,500
		Technical assistance from external experts and safety audit		30,000	1	30,000	
	Sub Total (ICC without HE)					**419,000**	**199,000**
HE	6	Heat exchanger processing modifications change to tube diameter to 5 mm	Heat Exchanger	200,000	1	200,000	200,000
		Sheet metal processing modifications		25,000	1	25,000	
	Sub Total HE					**225,000**	**200,000**
Contingencies 10%						**64,400**	**35,650**
IOCs	1	Compressors		8	19000	152,000	155,749
	2	Heat exchangers (Additional cost due to high wall thick)		-2.08	19000	39,520	
	3	Electrical and electronic PCB (Safety design)		7.6	19000	144,400	
	4	Refrigerant - 65% less charge the number of air-conditioners manufactured		-1.82	19000	34,580	
	Sub Total IOC USD @6.3					**222,300**	**155,749**
		Total ICC					**434,650**
		Total IOC					**155,749**
		Total agreed cost					**590,399**
		CE					**23.88**

PROJECT

Walton Industries Ltd.

Company Profile

S. N.	General information	
1	Name of Enterprise	Walton Hi-tech Industries Ltd.
2	Name of Contact Person	Mr. Ashraful Ambia
3	Designation of Contact Person	Executive Director
4	Address	
	Head Office	Level 3, Jiban Bima Bhaban 10 Dilkhusa, Motijheel, Dhaka-1000
	Phone	Mobile : + 8801678-028035, Office : 02-9571 634-6
	Email	email : engn@waltonbd.com
	Factory Office	Chandra, Kaliakair, Gazirpur, Bangladesh
	Phone	Mobile : + 8801678-028035, +88-02-9572 057
	Email	email : engn@waltonbd.com
5	Date of establishment/ registration,	2006
6	Date of commencing production	2007
7	Ownership profile	Indigenous shareholding
8	Number of employees	Managerial-556, Technical-1302, Staffs/Workers/Others- 14,057
9	Is any portion of the production exported?	Yes
10	Compliance with local environmental regulations	Yes
11	Category of industry	Large
12	Manufacturing products	Split ACs, Inverted AC, Cassette,

Refrigerant Consumption

Year	HCFC-22, ODS kg
2014	178,035
2015	186,202
2016	222,147

PROJECT COSTS

The total actual investment costs were **US$ 3,615,700.** This includes a 10% contingency. Details of incremental capital costs are provided in the sub-projects**.** IOCs were **US$ 1,399,526** for one year of operation. However, ICC and IOC were approved US$ 1,500,795 and US$ 1,399,526 respectively, which includes contingency cost, totaling US$ 2,900,321.

Manufacturing Process

The manufacturing process involves assembly process, leak test, and performance tests. The heat exchangers are cleaned internally with dry air/nitrogen. Sequentially, the sheet metal assembly is completed, heat exchangers are fitted, and compressor, fan motor, and electrical components are installed. Brazing is done to connect the mechanical refrigeration system. Post this the unit is tested for leakage using high pressure nitrogen/dry air and, after successful testing, is sent to evacuation and charging area. Before charging the refrigerant evacuation is completed to the level of 500 microns or less. In this process, After this step, the air-conditioner is again subjected to the leakage test, this time with the help of electronic leak detector. In case of leakage, cycle from pressure test onwards is repeated. Finally, the unit is subjected to performance tests and sent to packing and storage areas. A separate flow chart will be provided for this enterprise.

Baseline Equipment

Baseline Equipment	Equipment	Make	Model	Quantity	Year of installation
Assembly Conveyors, feeding lines & related equipment	Outdoor unit conveyor line (up to 3Ton)	China		146 m	2007
	Indoor unit Conveyor line	China		92 m	2007
	Out Door unit conveyor line (3Ton Plus)	China		80 m	2013
	Sub Assembly feeding lines	Walton		35 m	2007
	Assembly tools/hoists/cranes			18 set	2007
Pressure Testing & Leak Detection	Nitrogen leak Testing	Walton		2 set	2007
	Leak Detecting Machine (Inficon)	Denmark	HLD6000	2 set	2007
Evacuation System	Vacuum Pumps (Up to 3 Ton) (Ulvac)	China	GLD-201	25 set	2007
	Vacuum Pump (3 Ton Plus)	Korea		5 set	2013
Gas Charging	Gas Charging machine (Agramkaw)	Denmark	IMAC-HS	4 set	2007
Testing Equipment	Outdoor unit testing (up to 3Ton)	China		42 set	2007
	Outdoor unit testing (3Ton Plus)	China		10 set	2007
	Low voltage testing machine (Ainuo)	China	AN9651B(F)	2 set	2007
Final leak detection	Leak detection machine (Inficon)	Denmark	HLD6000	2	2007
Packing Equipment	Auto strapping machine	Taiwan	PW-316H	3	2007
	Styro foam making(Dongshan)	China	FAV 1400	1	2007
Others	PCB testing	China		1	2007
	Ultrasonic welding(Sonics)	Korea		4	2007
	Blower balancing(Xiaogan)	China		3	2011
	Foam Cutting(Walton)	Walton		1	2009
	Foam punching(Walton)	Walton		1	2011

Baseline Equipment	Equipment	Make	Model	Qty.	Year of installation
Heat Exchanger Manufacturing Equipment	Fin Press machine (Jiang Su Yang Li)	China	JFC21-63	4	2007 2010
	Auto Vertical Expander (Zongshan Colegon)	China	SLZJ-φ7/9.52	2	2007
	Fin Press Die	China		10	2007-2010
	Horizontal Vertical Expander(JDM)	China		1	2013
	Hairpin bending machine (Zhongshan Colego)	China	SCUJ-φ7/9.52	2	2007
	Hairpin bending (JDM)	China		1	2013
	Return U bending (Zhongshan Colego)	China	SXU5-7/9.52	1	2010
	Return U bending (JDM)	China		1	2013
	O ring insertion machine (Zhongshan Colego)	China	STHS-7/9.52	2	2007
	O ring setting machine (JDM)	China		1	2013
	U washing machine	China		1	2010
	Fan balancing machine (Xiaogan /JP Shangahi)	China	CAB-910 PHAS-16	2	2007 2013
	Coil In line brazing machine (Guangzhoud Know-how industries/ Sk Brazing)	China Korea	EQB-L-10011-8	2	2007 2013
	Condenser bending machine (Zongshan Colego)	China	SLZW-950	2	2007
	Condenser bending (JDM)	China		1	2007
	Heat chamber (China Xiaogan)	China		2	2007
	CNC bending (Zhongshan Colego)	China	SKWG-22 ZW 25 Zw15	3	2007 2013
	Auto flaring m/c (Walton)	Walton		2	2010
	Polish machine(Walton)	Walton		2	2013
	Manual cutting	Walton		2	2013
	Auto cutting machine (JDM)	China		3	2007
	Pipe end shaping (JDM)	China		2	2013
Sheet Metal processing machine	Shearing Machines (Yutani)	Japan		1	2014
	Power Presses (Seyi/OCP) 200/80/60/45/35/25 Ton	Taiwan	200 ton	15	2007-2014
	Hydraulic press	Taiwan	315 ton	2	2007
	Net bending machine(Walton)	Walton		1	2010
	Grinding machine (Metabo)			2	2010
	Welding machine			3	2010
	Top drill	China		1	2010
Sheet Metal processing machine	Spot welding (Panasonic)	Japan		1	
	Wire Straighting and cutting Machine (Chung Yu)	Taiwan		1	
	MIG welding machine (Panasonic)	Japan		1	
	Single Spot welding machine (WIM)	Malaysia	35KVA	1	
	Multispot welding machine (WIM)	Malaysia	35KVA	1	
	Wire Bending machine (Chengdu Gute Machinery)	China		1	
	Table grinding machine (Walton)	Walton		1	
	Side Trimming machine (Chung Yu Machinery)	China		1	
	Powder Coating Plant	India		2	

Baseline Equipment	Equipment	Make	Model	Quantity	Year of installation
Compressed Air	Air Compressor	Belgium		03	2007, 2010
	Air Dryers	Belgium		03	2007, 2010
Fire Safety Equipment	Fire Pump	USA		1 Unit	2010
Others	Nitrogen Generator	UK		03 Unit	2010

Equipment Action

S. N.	Equipment	Proposed action under the project
1	System, component and process redesign and prototype manufacturing and testing	Development, redesign
2	Storage tank for R290 and transfer and supply pump	New procurement and installation will be completed as per design layout
3	Heat exchanger processing modifications change to microchannel	Retrofitting of equipment plus new machinery will be procured
4	Civil construction cost to setup storage tanks	It will be mix of old construction usage as well as new construction
6	Sheet metal processing modifications	The tools and dies will be replaced but machine will be retrofitted
7	Assembly line modifications	
	Charging area modifications including refrigerant handling (transfer pump) equipment	New procurement
	Vacuum pumps	New procurement
	Helium Leak Detector	New procurement
	Refrigerant charging equipment (station) - R290	New procurement
	Refrigerant charging equipment (station) - HFC32	New procurement
	Ultrasonic sealing machine	New procurement
	Fire safety equipment, sensors, alarm system including sprinklers for refrigerant storage and safety certificate	New procurement
	Industrial leak detectors, flame sensors ,HLD etc.	New procurement
8	Recovery Station (Hydro Carbon Discharge Unit)	New procurement
9	Safety System at Enthalpy Test Chamber	New procurement
10	Quality inspection, finishing and testing modifications	-
11	Process, operation, maintenance and safety training	The training will be provided before the actual commercial production starts.
12	Technical assistance from external experts	Experts will be invited after the work plan is final.

Incremental Capital Costs and Incremental Operational Cost

RESIDENTIAL AIR-CONDITIONER (HC-290 up to 1.5 TR and HFC-32 <1.5TR) conversion				
COST CALCULATIONS (Cost in US$)				
No	**Item**	**Unit Cost (US $)**	**Walton**	
			Quantities	**Amount**
	Date of Establishment		**2006**	
	No. of Lines to be converted		2	
	No. of Units manufactured (2016) on the lines to be converted including units with >3TR		204,000	
	HCFC-22 consumption (kg)		222,147	
	Particulars			
1	System, component and process redesign and prototype manufacturing and testing	200,000	1	200,000
2	Storage tank for R290, supply pump, pipe lines	75,000	2	150,000
3	Heat exchanger processing modifications change to microchannel	1,200,000	1	1,200,000
4	Civil construction cost to setup storage tanks	50,000	1	50,000
5	Sheet metal processing modifications	100,000	1	100,000
6	Assembly line modifications			
	Charging area modifications including refrigerant handling (transfer pump) equipment	67,500	2	135,000
	Vacuum pumps	3,500	20	70,000
	Helium Leak Detector	90,000	1	90,000
	Refrigerant charging equipment (station) - R290	80,000	1	80,000
	Refrigerant charging equipment (station) - HFC32	60,000	1	60,000
	Ultrasonic sealing machine	40,000	2	80,000
	Fire safety equipment, sensors, alarm system including sprinklers for refrigerant storage and safety certificate	100,000	1	100,000
	Industrial leak detectors, flame sensors ,HLD etc.	18,000	2	36,000
7	Recovery Station (Hydro Carbon Discharge Unit)	18,000	2	36,000
8	Safety System at Enthalpy Test Chamber	50,000	2	100,000
9	Quality inspection, finishing and testing modifications	200,000	1	200,000
10	Process, operation, maintenance and safety training	100,000	1	100,000
11	Installation tool	20,000	200	400,000
12	Technical assistance from external experts	100,000	1	100,000
Sub-total				**3,287,000**
Contingencies (10%)				**328,700**
Total (ICC)				**3,615,700**
Incremental Operating Costs				
No	**Item**			
1	Compressors	8.00	204,000	1,632,000
2	Heat exchangers (Additional cost due to high wall thick)	-2.08	204,000	-424,320
3	Electrical and electronic PCB (Safety design)	8.60	204,000	1,754,400
4	Gas Detector and Solenoid Control Valve	3.00	204,000	612,000
5	Refrigerant - reduced charge in comparison to R22 (average charge for R22 is 1.2 kg/unit and 0.35 gms for R290)	-1.82	204,000	-371,280
Total (IOC)				**3,202,800**
Total eligible IOC				**1,399,526**
Total eligible Costs				
No	**Item**			
1	Incremental Capital Costs		-	3,615,700
2	Incremental Operating Costs		-	1,399,526
Total Costs			**-**	**5,015,226**
Less for non-A5 ownership				-
	Co-finance by industry			-
	GRAND TOTAL		**-**	**5,015,226**

Total funds approved by MLF, combining the various heads under ICC and IOC

Walton Hitech Industries (2 Lines)							
		Total Number of AC manufacture		204,000			
		Total HCFC-22 consumption (in MT)		222.15			
Level		ITEM	MLF Secretariat Nomenclature	Original Proposal			Negotiated final cost
				Unit Cost	Qty	Total Cost	
Investment - Conversion of Lines	1	System, component and process redesign and prototype manufacturing and testing	System and Product design	200,000	1	200,000	80,000
	2	Storage tank for R290, supply pump, pipe lines	Storage & Supply System	75,000	2	150,000	125,000
	3	Civil construction cost to setup storage tanks		50,000	1	50,000	
	4	Charging area modifications including refrigerant handling (transfer pump) equipment		67,500	2	135,000	
		Vacuum pumps	Assembly Line for charging	3,500	20	70,000	330,000
		Helium Leak Detector		90,000	1	90,000	
		Refrigerant charging equipment (station) - R290		80,000	1	80,000	
		Refrigerant charging equipment (station) - HFC32		60,000	1	60,000	
		Ultrasonic sealing machine		40,000	2	80,000	
		Fire safety equipment, sensors, alarm system including sprinklers for refrigerant storage and safety certificate		100,000	1	100,000	
		Industrial leak detectors, flame sensors ,HLD etc.		18,000	2	36,000	
	5	Recovery Station (Hydro Carbon Discharge Unit)		18,000	2	36,000	
	6	Safety System at Enthalpy Test Chamber	Quality Control, civil works and installation tools	50,000	2	100,000	100,000
	7	Quality inspection, finishing and testing modifications		200,000	1	200,000	
	8	Installation tool		20,000	20	400,000	
	9	Process, operation, maintenance and safety training	Technical Assistance, installation, training and safety verification	100,000	1	100,000	104,450
	10	Technical assistance from external experts		100,000	1	100,000	
	11	Safety audit		0	1	0	
	12	Civil construction and installation @7% of investment cost		0	1	0	
	Sub-total					**1,987,000**	**739,450**
HE	3	Heat exchanger processing modifications change to microchannel		1,200,000	1	1,200,000	629,000
	5	Sheet metal processing modifications		100,000	1	100,000	

						1,300,000	**629,000**
Contingencies 10%						**328,700**	**132,345**
IOC	1	Compressors		8	204,000	1,632,000	1,399,526
	2	Heat exchangers (Additional cost due to high wall thick)		-2.08	204,000	-424,320	
	3	Electrical and electronic PCB (Safety design)		8.6	204,000	1,754,400	
	4	Gas Detector and Solenoid Control Valve		3	204,000	612,000	
	5	Refrigerant - reduced charge in comparison to R22 (average charge for R22 is 1.2 kg/unit and 0.35 gms for R290)		-1.82	204,000	-371,280	
	Sub-Total (IOC)					**3,202,800**	**1,399,526**
						TOTAL ICC	**1,500,795**
						TOTAL IOC	**1,399,526**
						Total Agreed Cost	**2,900,321**
						COST-EFFECTIVINESS (USD/KG)	**13.06**

PROJECT

Supreme Air-conditioning Co.

Company Profile

S. N.	General information	
1	Name of Enterprise	Supreme Air Conditioning Co.
2	Name of Contact Person	Mr. Lutfar Rahman
3	Designation of Contact Person	Deputy Managing Director
4	Address	
	Head Office	House # 04, Road # 12, Section 01, Uttara, Dhaka 1230, Bangladesh.
	Phone	+8801713001353
	Email	suprim@agnionline.com
	Factory Office	721/C, Uttarkhan, Uttara, Dhaka-1230
	Phone	+88- 0188-2122911
	Email	suprim@agnionline.com
5	Date of establishment/ registration	2004
6	Date of commencing production	2005
7	Ownership profile	Indigenous shareholding
8	Number of employees	Managerial- 24, Technical-38, Staff/ workers/ others - 134
9	Is any portion of the production exported?	No
10	Compliance with local environmental regulations	Yea
11	Category of industry	Medium
12	Manufacturing products	Window ACs, Split ACs, Inverted AC, Cassette, Ducted Packed system

Refrigerant Consumption

Year	HCFC-22, ODS kg
2014	15,000
2015	18,750
2016	24,973

PROJECT COSTS

The total actual investment costs were **US$ 504,900.** This includes a 10% contingency. Details of incremental capital costs are provided in the sub-projects**.** IOCs were **US$ 157,330** for one year of operation. However, ICC and IOC were approved US$ 214,650 and US$ 157,330 respectively, which includes contingency cost, totaling US$ 371,980.

Manufacturing Process

The manufacturing process involves assembly process, leak test, and performance tests. The heat exchangers are cleaned internally with dry air/nitrogen. Sequentially, the sheet metal assembly is completed, heat exchangers are fitted, and compressor, fan motor, and electrical components are installed. Brazing is done to connect the mechanical refrigeration system. Post this the unit is tested for leakage using high pressure nitrogen/dry air and, after successful testing, is sent to evacuation and charging area. Before charging the refrigerant evacuation is completed to the level of 500 microns or less. In this process, After this step, the air-conditioner is again subjected to the leakage test, this time with the help of electronic leak detector. In case of leakage, cycle from pressure test onwards is repeated. Finally, the unit is subjected to performance tests and sent to packing and storage areas.

Baseline Equipment

Baseline Equipment	Equipment	Make	Model	Quantity	Year of installation
Assembly Conveyors, feeding lines & related equipment	Outdoor unit conveyors line (up to 3 RT)	China		73 m	2006
	Indoor unit conveyors line	China		43 m	2006
	Outdoor unit conveyor line (more than 3 RT)	China		43 m	2011
	Sub Assembly feeding lines	China			
	Assembly loots/hoists/cranes			6 sets	2006
Pressure Testing &	Nitrogen leak testing	China		1 set	2006
Leak Detection	Leak detection machine	China		1 set	2006
Evacuation System	Vacuum Pumps	China		4 sets	2006
Gas Charging	Gas charging machine	China		2 sets	2006
Testing Equipment	Outdoor unit testing (up to 3 RT)	China		12 sets	2006
	Outdoor unit testing (more than 3 RT)	China		2 sets	2006
	Low voltage testing machine	China		1 set	2006
Final leak detection	Leak detection machine	China		1 set	2006
Packing Equipment	Auto strapping machine	China		2	2006
Others	PCB testing	China		1	2006
	Ultrasonic welding	China		1	2006
Sheet Metal Fabrication & Painting Line	Shearing Machines	China		1	2006
	Grinding machine	China		1	2008
	Spot welding	China		1	2006
	Top drill	China		1	2007
	Power presses	China		5	2006 & 2012
	Wire straitening cutting machine	China		1	2012
	Hydraulic press	China		1	2006
	Welding machine	China		1	2011
	Net bending machine	China		1	2011
	Multi spot welding machine	China		1	2006
	Wire bending machine	China		1	2008
	Single spot welding machine	China		1	2006
	Powder coating plant	China		1	2008
	Side trimming machine	China		1	2007
	MIG welding machine	China		1	2006
	Table grinding machine	China		1	2006
Compressed Air	Air Compressor				
	Air Dryers				
Fire Safety Equipment	Fire Pump	China		1	2012

Equipment	Proposed Action under the project
System, component and process redesign and prototype manufacturing and testing	Development, redesign
Assembly line modifications	
Mass flow Flammable refrigerant charging and supply station for R290	new procurement
Mass flow Flammable refrigerant charging and supply station for R32	new procurement
Safety system for Charging and supply area (one each)	new procurement
Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr	new procurement
Ultrasonic sealing machine	new procurement
HC leak detector for R-290 and R-32 (one each)	new procurement
Repair area accessories (like blow off unit for R290 and R-32) (one each)	new procurement
Civil and electric works for Installation, commissioning package	Retrofitting as per design and requirement
Quality inspection, finishing and testing modifications	-
Process, operation, maintenance and safety training	The training will be provided before the actual commercial production starts.
Technical assistance from external experts	Experts will be invited after the work plan is final.

Incremental Capital Costs and Incremental Operational Cost

RESIDENTIAL AIR-CONDITIONER (HC-290 up to 1.5 TR and HFC-32 >1.5TR) conversion				
COST CALCULATIONS				
No	**Item**	**Unit Cost (US $)**	**Supreme Air-Conditioning Co.**	
			Quantities	**Amount**
	Date of Establishment		**1986**	
	No. of Lines to be converted		1	
	No. of Units manufactured (2016) on the lines to be converted including units with >3TR		20,000	
	HCFC-22 consumption (kg)		24,973	
	Particulars		Value in set	
1	System, component and process redesign and prototype manufacturing and testing	18,000	3	54,000
2	Assembly line modifications			0
	Massflow Flammable refrigerant charging and supply station for R290	80,000	1	80,000
	Massflow Flammable refrigerant charging and supply station for R32	60,000	1	60,000
	Safety system for Charging and supply area (one each)	77,000	1	77,000
	Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr	3,500	3	10,500
	Ultrasonic sealing machine	25,000	1	25,000
	HC leak detector for R-290 and R-32 (one each)	20,000	1	20,000
	Repair area accessories (like blow off unit for R290 and R-32) (one each)	7,500	1	7,500
	Civil and electric works for Installation, commissioning package	20,000	1	20,000
3	Quality inspection, finishing and testing modifications	15,000	1	15,000
4	Process, operation, maintenance and safety training	20,000	1	20,000
5	Technical assistance from external experts	30,000	1	30,000
6	Tools	2,000	20	40,000
Sub-total				**459,000**
	Contingencies (10%)			**45,900**
ICC				**504,900**
Incremental Operating Costs				
No	**Item**			
1	Compressors	8.00	20,000	160,000
2	Heat exchanger procurement price difference	2.08	20,000	41,600
3	Electrical and electronic PCB (Safety design)	7.60	20,000	152,000
4	Refrigerant - 65% less charge (average charge for 22 is 1.2 Kgs. and 0.35 kg of R290), the number of air conditioners manufactured	-1.82	20,000	-36,400
Total (IOC)				**317,200**
Eligible IOC				**157,330**
Total Costs				
No	**Item**			
1	Incremental Capital Costs			504,900
2	Incremental Operating Costs			157,330
Total Costs				**662,230**
Less for non-A5 ownership				-
Co-finance by industry				NA
	GRAND TOTAL			**662,230**

Total funds approved by MLF, combining the various heads under ICC and IOC

Supreme Air-conditioning Co.							
		Total Number of AC manufacture		20,000			
		Total HCFC-22 consumption (in MT)		24.97			
Level	Industry Nomenclature		MLF Secretariat Nomenclature	Original Proposal			Negotiated final cost
				Unit Cost	Qty	Total Cost	
Investment - Conversion of Lines	1	System, component and process redesign and prototype manufacturing and testing	System and Product design	18,000	3	54,000	20,000
	2	Mass flow Flammable refrigerant charging and supply station for R290	Assembly Line for charging	80,000	1	80,000	80,500
		Mass flow Flammable refrigerant charging and supply station for R32		60,000	1	60,000	
		Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr.		3,500	3	10,500	
		Ultrasonic sealing machine		25,000	1	25,000	
		HC leak detector for R-290 and R-32 (one each)		20,000	1	20,000	
		Repair area accessories (like blow off unit for R290 and R-32) (one each)		7,500	1	7,500	
	3	Safety system for Charging and supply area (one each)	Storage & Supply System	77,000	1	77,000	45,000
	4	Civil and electric works for Installation, commissioning package	Quality Control, civil works and installation tools	20,000	1	20,000	11,000
		Quality inspection, finishing and testing modifications		15,000	1	15,000	
	5	Process, operation, maintenance and safety training	Technical Assistance, installation, training and safety verification	20,000	1	20,000	42,500
		Technical assistance from external experts and safety audit		30,000	1	30,000	
	Sub Total (ICC without HE)					**419,000**	**199,000**
	Contingencies 10%					**41,900**	**15,650**
IOCs	1	Compressors		8	15500	124,000	157,330
	2	Heat exchangers (Additional cost due to high wall thick)		-2.08	15500	-32,240	
	3	Electrical and electronic PCB (Safety design)		7.6	15500	117,800	
	4	Refrigerant - 65% less charge the number of air-conditioners manufactured		-1.82	15500	-28,210	
	Sub Total IOC USD @6.3					**181,350**	**157,330**
		Total ICC					**214,650**
		Total IOC					**157,330**
		Total agreed cost					**370,399**
		CE					**14.90**

PROJECT

Unitech Products Ltd.

Company Profile

S. N.	General information	
1	Name of Enterprise	Unitech Products (BD) Ltd.
2	Name of Contact Person	Engr. Anish Ahmed
3	Designation of Contact Person	Managing Director
4	Address	
	Head Office	House# 8412 (4lh Floor), Road # 7/A, Dhanmondi R/A, Dhaka-1209, Bangladesh
	Phone	+880 2 8121056, +880 2 8116271
	Email	mdanis@penquinbd.com
5	Date of establishment/ registration,	1999
6	Date of commencing production	8 May 2000
7	Ownership profile	Indigenous shareholding
8	Number of employees	Managerial- 7, Technical-30, Staff/ workers/ others - 70
9	Is any portion of the production exported?	No
10	Compliance with local environmental regulations	Yes
11	Category of industry	Medium
12	Manufacturing products	Split ACs

Refrigerant Consumption

Year	HCFC-22, ODS kg
2014	11,891
2015	13,513
2016	15,133

PROJECT COSTS

The total actual investment costs are **US$ 471,600.** This includes a 10% contingency. Details of incremental capital costs are provided in the sub-projects**.** IOCs are **US$ 95,338** for one year of operation. However, ICC and IOC were approved US$ 434,650 and US$ 95,338 respectively, which includes contingency cost, totaling US$ 529,988.

Manufacturing Process

The manufacturing process involves assembly process, leak test, and performance tests. The heat exchangers are cleaned internally with dry air/nitrogen. Sequentially, the sheet metal assembly is completed, heat exchangers are fitted, and compressor, fan motor, and electrical components are installed. Brazing is done to connect the mechanical refrigeration system. Post this the unit is tested for leakage using high pressure nitrogen/dry air and, after successful testing, is sent to evacuation and charging area. Before charging the refrigerant evacuation is completed to the level of 500 microns or less. In this process, after this step, the air-conditioner is again subjected to the leakage test, this time with the help of electronic leak detector. In case of leakage, cycle from pressure test onwards is repeated. Finally, the unit is subjected to performance tests and sent to packing and storage areas.

Baseline Equipment

Baseline Equipment	Equipment	Make	Model	Quantity	Year of installation
Assembly Conveyors, feeding lines & related equipment	Conveyors (length 24 m)	China		1	2000
	Assembly tools/hoists/cranes			10	2000
	Sub Assembly feeding lines	Unitech		1	2000
Pressure Testing & Leak detection	Pressure testing M/C	Singapore		1	2000
Evacuation System	Vacuum Pumps - Stage I			2	2000
	Vacuum Pump - Stage II				
Gas Charging	(Agramkaw)			1	
Testing Equipment Final leak detection	Testing Panel	Unitech		1	2000
Packing Equipment	Packing M/C	China		1	2014
Heat Exchanger Manufacturing Equipment	Fin Press machine	Taiwan, China	JL21-45C & KFH 10212	2	2000 & 2007
	Tube Straight and cutting machines	Taiwan, China	JAK-B5-133-58101666	2	2000 & 2007
	Testing Equipment			2	2000
	Tube expanders	Taiwan, China	TRIDAN FE3	4	2000 & 2007
	Tube Bending M/C	China	King-KFH-10213 & KFH-10214	2	2013
	Electric oven	Singapore		2	2000
Sheet Metal Fabrication and Painting line					
	Shearing Machines		LVD HSL 31/6 & ACCURL4X2500	2	2000 & 2014
	Power Presses(Mech)		HEILBORRN-EPV-20,21,22,23 & 24	6	2000
	Power Presses (Hydraulic)		Accurl-Y-32,33 & 34	3	2012
	Turret Punch		Vipros 255	1	2005
	Bending M/C		NCC AUTO/GC, CNC3 HAP 2580	3	2000 & 2007
	MIG Welding M/C		Miller -305C	2	
	Spot welding M/C		LENCOSPOT-L400	4	
	Chemical Plant and powder coating system	Singapore		1	2000
Others	Injection Moulding M/C	China	Haitian SA 1200, SA 3800 and MA 8000	3	2005 & 2013

	Balancing M/C	China	BLD5 and YYQ5	4	2005 & 2013
	Ultrasonic welding M/C	China		2	2013
	Temp. Controller	China	Omoron E5EZ	1	2013
Compressed Air	Air Compressor	Italy	Fini SKJ75-500-75 & ZENIHT-15	3	2000 & 2005
	Air Dryers	Italy		3	2000 & 2005
Fire Safety Equipment	Fire extinguisher			60	2000
	Water bucket			20	2000
	Generator 550 kva	Scania	SGE 500 CVS	2	2000 & 2013

Equipment Action

S. N.	Equipment	Proposed Action under the project
1	System, component and process redesign and prototype manufacturing and testing	Development, redesign
2	Heat exchanger processing modifications change to tube diameter to 5 mm	Change of moulds and dies, the vertical expander tools will be changed
3	Sheet metal processing modifications	The dies of will be replaced
4	Assembly line modifications	
	Mass flow Flammable refrigerant charging and supply station for R290	new procurement
	Mass flow Flammable refrigerant charging and supply station for R32	new procurement
	Safety system for Charging and supply area (one each)	new procurement
	Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr	new procurement
	Ultrasonic sealing machine	new procurement
	HC leak detector for R-290 and R-32 (one each)	new procurement
	Repair area accessories (like blow off unit for R290 and R-32) (one each)	new procurement
	Civil and electric works for Installation, commissioning package	Retrofitting as per design and requirement
5	Quality inspection, finishing and testing modifications	-
6	Process, operation, maintenance and safety training	The training will be provided before the actual commercial production starts.
7	Technical assistance from external experts	Experts will be invited after the work plan is final.

Incremental Capital Costs and incremental operational cost

RESIDENTIAL AIR-CONDITIONER (HC-290 up to 1.5 TR and HFC-32 >1.5TR) conversion				
COST CALCULATIONS				
			(Cost in US$)	
S. N.	**Item**	**Unit Cost (US $)**	**Unitech**	
			Quantities	**Amount**
	Date of Establishment		**2000**	
	No. of Lines to be converted		1	
	No. of Units manufactured (2016) on the lines to be converted including units with >3TR		14,000	
	HCFC-22 consumption (kg)		15,133	
	Particulars		Value in set	
1	System, component and process redesign and prototype manufacturing and testing	18,000	2	36,000
2	Heat exchanger processing modifications change to tube diameter to 5 mm	200,000	1	200,000
3	Sheet metal processing modifications:	25,000	1	25,000
4	Assembly line modifications			
	Massflow Flammable refrigerant charging and supply station for R290	80,000	1	80,000
	Massflow Flammable refrigerant charging and supply station for R32	60,000	1	60,000
	Safety system for Charging and supply area (one each)	77,000	1	77,000
	Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr	3,500	3	10,500
	Ultrasonic sealing machine	25,000	1	25,000
	HC leak detector for R-290 and R-32 (one each)	20,000	1	20,000
	Repair area accessories (like blow off unit for R290 and R-32) (one each)	7,500	1	7,500
	Civil and electric works for Installation, commissioning package	20,000	1	20,000
5	Quality inspection, finishing and testing modifications	15,000	1	15,000
6	Process, operation, maintenance and safety training	20,000	1	20,000
7	Technical assistance from external experts	30,000	1	30,000
8	Tools	2000	15	30,000
Sub-total				**656,000**
	Contingencies (10%)			**65,600**
Total (ICC)				**721,600**
Incremental Operating Costs				
No	**Item**			
1	Compressors	8.00	14,000	112,000
2	Heat exchangers (Additional cost due to high wall thick)	-2.08	14,000	-29,120
3	Electrical and electronic PCB (Safety design)	7.60	14,000	106,400
4	Refrigerant - 65% less charge (average charge for 22 is 1.2 Kgs. and 0.35 kg of R290), the number of air-conditioners manufactured	-1.82	14,000	-25,480
Total (IOC)				**163,800**
Total (IOC)				**95,338**
Total Costs				
No	**Item**			
1	Incremental Capital Costs			721,600
2	Incremental Operating Costs			95,338
Total Costs				**816,938**
Less for non-A5 ownership				-
	Co-finance by industry			250,000
	GRAND TOTAL		**-**	**566,938**

Total funds approved by MLF, combining the various heads under ICC and IOC

Unitech Products							
	Total Number of AC manufacture		14,000				
	Total HCFC-22 consumption (in MT)		15.13				
Level	**Industry Nomenclature**		**MLF Secretariat Nomenclature**	**Original Proposal**			**Negotiated final cost**
				Unit Cost	**Qty**	**Total Cost**	
Investment - Conversion of Lines	1	System, component and process redesign and prototype manufacturing and testing	System and Product design	18,000	2	36,000	20,000
	2	Mass flow Flammable refrigerant charging and supply station for R290	Assembly Line for charging	80,000	1	80,000	80,500
		Mass flow Flammable refrigerant charging and supply station for R32		60,000	1	60,000	
		Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr.		3,500	3	10,500	
		Ultrasonic sealing machine		25,000	1	25,000	
		HC leak detector for R-290 and R-32 (one each)		20,000	1	20,000	
		Repair area accessories (like blow off unit for R290 and R-32) (one each)		7,500	1	7,500	
	3	Safety system for Charging and supply area (one each)	Storage & Supply System	77,000	1	77,000	45,000
	4	Civil and electric works for Installation, commissioning package	Quality Control, civil works and installation tools	20,000	1	20,000	11,000
		Quality inspection, finishing and testing modifications		15,000	1	15,000	
	5	Process, operation, maintenance and safety training	Technical Assistance, installation, training and safety verification	20,000	1	20,000	42,500
		Technical assistance from external experts and safety audit		30,000	1	30,000	
	Sub Total (ICC without HE)					**401,000**	**199,000**
HE	6	Heat exchanger processing modifications change to tube diameter to 5 mm	Heat Exchanger	200,000	1	200,000	200,000
		Sheet metal processing modifications		25,000	1	25,000	
	Sub Total HE					**225,000**	**200,000**
Contingencies 10%						**62,600**	**35,650**
IOCs	1	Compressors		8	15500	124,000	95,338
	2	Heat exchangers (Additional cost due to high wall thick)		-2.08	15500	-32,240	
	3	Electrical and electronic PCB (Safety design)		7.6	15500	117,800	
	4	Refrigerant - 65% less charge the number of air-conditioners manufactured		-1.82	15500	-28,210	
	Sub Total IOC					**181,350**	**95,338**
		Total ICC					**434,650**
		Total IOC					**95,338**
		Total agreed cost					**529,988**
		CE					**35.03**

PROJECT

Elite Hitech Industries Ltd.

Company Profile

S. N.	General information	
1	Name of Enterprise	Elite Hi-tech industries Ltd.
2	Name of Contact Person	Md. Noor A Alam
3	Designation of Contact Person	Deputy Managing Director
4	Address	
	Head Office	Level 6, 18 Rajuk Avenue, Mtijheel Dhaka- 1000, Bangladesh.
	Phone	+8801708551010, +8801712106902
	Email	noor@noortrade.com.bd
	Factory Office	Plot 6613, Korpai, Burichong, Comilla
	Phone	+8801708551011
	Email	noor@noortrade.com.bd
5	Date of establishment/ registration,	1992
6	Date of commencing production	2003
7	Ownership profile	Indigenous shareholding
8	Number of employees	Manngerial- 24, Technical-88, Staff/ workers/ others - 1343
9	Is any portion of the production exported?	No
10	Compliance with local environmental regulations	Yes
11	Category of industry	Medium
12	Manufacturing products	Window ACs, Split ACs, Inverted AC, Cassette, Ducted Packed system

Refrigerant Consumption

Year	HCFC-22, ODS kg
2014	17,992
2015	19,376
2016	21,461

PROJECT COSTS

The total actual investment costs requested were **US$ 541,100.** This includes a 10% contingency. Details of incremental capital costs are provided in the sub-projects**.** IOCs were **US$ 135,204** for one year of operation. However, ICC and IOC were approved US$ 316,950 and US$ 135,204 respectively, which includes contingency cost, totaling US$ 452,154.

Manufacturing Process

The manufacturing process involves assembly process, leak test, and performance tests. The heat exchangers are cleaned internally with dry air/nitrogen. Sequentially, the sheet metal assembly is completed, heat exchangers are fitted, and compressor, fan motor, and electrical components are installed. Brazing is done to connect the mechanical refrigeration system. Post this the unit is tested for leakage using high pressure nitrogen/dry air and, after successful testing, is sent to evacuation and charging area. Before charging the refrigerant evacuation is completed to the level of 500 microns or less. In this process, After this step, the air-conditioner is again subjected to the leakage test, this time with the help of electronic leak detector. In case of leakage, cycle from pressure test onwards is repeated. Finally, the unit is subjected to performance tests and sent to packing and storage areas.

Baseline Equipment

Baseline Equipment	Equipment	Make	Model	Quantity	Year of installation
Assembly Conveyors, feeding lines & related equipment	Outdoor unit conveyors line (up to 3 RT)	China		68 m	2003
	Indoor unit conveyors line	China		53 m	2003
	Assembly tools/hoists/cranes	China		1 set	2010
	Sub Assembly feeding lines	China		2 sets	2003
	Assembly loots/hoists/cranes			4 sets	2003
	Welding Torch	Weldro		2 sets	2003
	Pneumatic Screwdriver- small	Hymair	AT-4060	1 set	2003
	Pneumatic Screwdriver- small	Onppon	OP-301	10 sets	2003
	Pneumatic Screwdriver- medium	Onppon	OP-306	24 sets	2003
	Electrical Screw Driver	Kilews	TKS-1300	2 sets	2003
	Air Compressor	China	J-08AP	1 set	2003
	Air Dryer	China		1 set	2003
	Pneumatic Lifting Jack	China		2 sets	2003
Pressure Testing & Leak detection	Nitrogen leak testing	China		1 set	2003
	Leak detection machine	Germany	HLD6000	2 set	2003
Evacuation System	Vacuum Pumps (1 stage)	Germany	TRIVAC D30C	36 sets	2003
	Vacuum Pumps (2 stage)	Germany	Kinco	2 sets	2010
Gas Charging	Refrigerant Charging Machine	Italy		2 sets	2003
Testing Equipment	Outdoor unit testing (up to 3 RT)	China		10 sets	2003
	Outdoor unit testing (more than 3 RT)	China		3 sets	2003
	Low voltage testing machine	China		2 sets	2003
	Electrical Safety Comprehensive Tester	China		2 sets	2003
Final leak detection	Refrigerant leak detector	Germany	HLD6000	2 set	2003
Packing Equipment	Auto strapping machine	China		2 sets	2003
Others	PCB testing	China		1 set	2003
	Ultrasonic welding	China		1 set	2003
	Barcode Scanner	China		6 sets	2003 & 2010
	Hot Air Gun	China		8 sets	2003
Heat Exchanger Manufacturing Equipment	Fin Press Machine	China	GC60P	2 sets	2003 & 2010
	Fine Press Die	China		2 sets	2003 & 2011
	Fan balancing machine	China		1 set	2003
	Condenser bending machine	China		2 sets	2003 & 2009
	Automatic Welding machine	China		1 set	2010
	Auto cutting machine	China		1 set	20101

	Auto vertical expander	China		1 set	2009
	Return U bending (Hairpin)	China		1 set	2012
	Vertical expander	China	YZL1200	2 sets	2011
	Heating Oven chamber	China		1 set	2003
	CNC Tube bending	China		1 set	2003
	Auto flaring machine	China		1 set	2006
	Manual cutting	China		2 sets	2008
	Pipe end shaping	China		1 set	2007
	Coil in line brazing machine	China		1 set	2003
	O ring setting machine	China		2 sets	2005
	Leak Detection Machine	China	ULVAC	1 set	2003
	Psychometric Lab	China	GZLans	1 set	2010
Sheet Metal Fabrication & Painting Line	Shearing Machines	China		1 set	2003
	Grinding machine	China		1 set	2003
	Spot welding	China		1 set	2003
	CNC Lathe Machine	China	C6146	2 sets	2005
	Power presses	China		5 sets	2003 & 2009
	Wire Straightening & Cutting Machine	China	YH-BE	2 sets	2010
	Hydraulic press	China		2 sets	2003
	Ultrasonic Welding Machine	China		1 set	2010
	Vertical Milling Machine	China		1 set	2009
	Multi spot welding machine	China		2 sets	2003
	Electric Discharge Machine EDM	China	ZNC450	1 set	2007
	Single spot welding machine	China		2 sets	2003
	Powder coating plant	USA		1 set	2003
	Side trimming machine	China		1 set	2003
	Vertical Machining Centre (VMC)	China	TFDC650	1 set	2003
	Wire Cut Machine	China	DK7732	1 set	2003
Compressed Air	Air Compressor	AtlasCopco Belgium	GA90VS D	2 sets	2003
	Air Dryers	AtlasCopco Belgium	FX16 (A14)	2 sets	2003
Fire Safety Equipment	Fire Pump	China		1 set	2010
	Fire Extinguish er	China		28 sets	2003
Others	Nitrogen Generation Plant	AtlasCopco Belgium	NGP25+	1 set	2008
	Oxygen Generation Plant	AtlasCopco Belgium	OGP35+	1 set	2008

Equipment Action

Equipment	Proposed Action under the project
System, component and process redesign and prototype manufacturing and testing	Development, redesign
Heat exchanger processing modifications change to tube diameter to 5 mm	Change of moulds and dies, the vertical expander tools will be changed
Sheet metal processing modifications	The dies of will be replaced
Assembly line modifications	
Mass flow Flammable refrigerant charging and supply station for R290	new procurement
Mass flow Flammable refrigerant charging and supply station for R32	new procurement
Safety system for Charging and supply area (one each)	new procurement
Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr	new procurement
Ultrasonic sealing machine	new procurement
HC leak detector for R-290 and R-32 (one each)	new procurement
Repair area accessories (like blow off unit for R290 and R-32) (one each)	new procurement
Civil and electric works for Installation, commissioning package	Retrofitting as per design and requirement
Quality inspection, finishing and testing modifications	-
Process, operation, maintenance and safety training	The training will be provided before the actual commercial production starts.
Technical assistance from external experts	Experts will be invited after the work plan is final.

Incremental Capital Costs and incremental operating cost

RESIDENTIAL AIR-CONDITIONER (HC-290 up to 1.5 TR and HFC-32 >1.5TR) conversion				
COST CALCULATIONS				
No	**Item**	**Unit Cost (US $)**	**Quantity**	**Amount**
	Date of Establishment		**1992**	
	No. of Lines to be converted		1	
	No. of Units manufactured (2016) on the lines to be converted including units with >3TR		15,500	
	HCFC-22 consumption (kg)		21,461	
	Particulars		Value in set	
1	System, component and process redesign and prototype manufacturing and testing	18,000	3	54,000
2	Heat exchanger processing modifications change to tube diameter to 5 mm	200,000	1	200,000
3	Sheet metal processing modifications :	25,000	1	25,000
4	Assembly line modifications			
	Massflow Flammable refrigerant charging and supply station for R290	80,000	1	80,000
	Massflow Flammable refrigerant charging and supply station for R32	60,000	1	60,000
	Safety system for Charging and supply area (one each)	77,000	1	77,000
	Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr	3,500	3	10,500
	Ultrasonic sealing machine	25,000	1	25,000
	HC leak detector for R-290 and R-32 (one each)	20,000	1	20,000
	Repair area accessories (like blow off unit for R290 and R-32) (one each)	7,500	1	7,500
	Civil and electric works for Installation, commissioning package	20,000	1	20,000
5	Quality inspection, finishing and testing modifications	15,000	1	15,000
6	Process, operation, maintenance and safety training	20,000	1	20,000
7	Technical assistance from external experts	30,000	1	30,000
8	Tools	2,000	15	30,000
Sub-total				**674,000**
Contingencies (10%)				**67,400**
Total (ICC)				**741,400**
Incremental Operating Costs				
No	**Item**			
1	Compressors	8.00	15,500	124,000
2	Heat exchangers (Additional cost due to high wall thick)	-2.08	15,500	-32,240
4	Electrical and electronic PCB (Safety design)	7.60	15,500	117,800
5	Refrigerant - 65% less charge (average charge for 22 is 1.2 Kgs. and 0.35 kg of R290), the number of airconditioners manufactured	-1.82	15,500	-28,210
Total (IOC)				**181,350**
Total eligible (IOC)				**135,204**
Total Costs				
No	**Item**			
1	Incremental Capital Costs			741,100
2	Incremental Operating Costs			135,204
Total Costs				**876,304**
Less for non-A5 ownership				-
	Co-finance by industry			200,000
	GRAND TOTAL		**-**	**676,304**

Total funds approved by MLF, combining the various heads under ICC and IOC

Elite Hi-Tech							
		Total Number of AC manufacture		15,500			
		Total HCFC-22 consumption (in MT)		21.46			
Level	**Industry Nomenclature**		**MLF Secretariat Nomenclature**	**Original Proposal**			**Negotiated final cost**
				Unit Cost	**Qty**	**Total Cost**	
Investment - Conversion of Lines	1	System, component and process redesign and prototype manufacturing and testing	System and Product design	18,000	3	54,000	20,000
	2	Mass flow Flammable refrigerant charging and supply station for R290	Assembly Line for charging	80,000	1	80,000	80,500
		Mass flow Flammable refrigerant charging and supply station for R32		60,000	1	60,000	
		Vacuum pumps with VAC gauge and manifold - 2 stage 30m3/hr.		3,500	3	10,500	
		Ultrasonic sealing machine		25,000	1	25,000	
		HC leak detector for R-290 and R-32 (one each)		20,000	1	20,000	
		Repair area accessories (like blow off unit for R290 and R-32) (one each)		7,500	1	7,500	
	3	Safety system for Charging and supply area (one each)	Storage & Supply System	77,000	1	77,000	45,000
	4	Civil and electric works for Installation, commissioning package	Quality Control, civil works and installation tools	20,000	1	20,000	11,000
		Quality inspection, finishing and testing modifications		15,000	1	15,000	
	5	Process, operation, maintenance and safety training	Technical Assistance, installation, training and safety verification	20,000	1	20,000	42,500
		Technical assistance from external experts and safety audit		30,000	1	30,000	
	Sub Total (ICC without HE)					**419,000**	**199,000**
HE	6	Heat exchanger processing modifications change to tube diameter to 5 mm	Heat Exchanger	200,000	1	200,000	93,000
		Sheet metal processing modifications		25,000	1	25,000	
	Sub Total HE					**225,000**	**93,000**
Contingencies 10%						**64,400**	**24,950**
IOCs	1	Compressors		8	15500	124,000	135,204
	2	Heat exchangers (Additional cost due to high wall thick)		-2.08	15500	-32,240	
	3	Electrical and electronic PCB (Safety design)		7.6	15500	117,800	
	4	Refrigerant - 65% less charge the number of air-conditioners manufactured		-1.82	15500	-28,210	
	Sub Total IOC USD @6.3					**181,350**	**135,204**
		Total ICC					**316,950**
		Total IOC					**135,204**
		Total agreed cost					**452,154**
		CE					**21.07**

PROJECT

Cooling Point Engineering Services

Company Profile

S.l.	General information	
1	Name of Enterprise	Cooling Point Engineering Services
2	Name of Contact Person	Md. Asaduzzaman
3	Designation of Contact Person	Proprietor
4	Address	
	Head Office	8/9 Aurongojeb Road, Blocck-A, Mohammadpur, Dhaka-1207
	Phone	+(88-02) 912 9265, 01911 341 873
	Email	c.pe.s.asad@yahoo.com
	Factory Office	01711 164 875, 01707-341 873
	Email	c.pe.s.asad@yahoo.com
5	Date of establishment/ registration,	1994
6	Date of commencing production	2002
7	Ownership profile	Indigenous shareholding
8	Number of employees	Managerial- 8, Technical-64, Staff/ workers/ others - 43
9	Is any portion of the production exported?	No
10	Compliance with local environmental regulations	Yes
11	Category of industry	Small
12	Manufacturing products	Chillers

Refrigerant Consumption

Year	HCFC-22, ODS kg
2014	2126.5
2015	2283.3
2016	2353

PROJECT COSTS

The total actual investment costs are **US$ 108,450.** This includes a 10% contingency. Details of incremental capital costs are provided in the sub-projects**.** IOCs are **US$ 14,824** for one year of operation. However, ICC and IOC were approved US$ 60,000 and US$ 14,824 respectively, which includes contingency cost, totaling US$ 74,824.

Manufacturing Process

The manufacturing process involves assembly process, leak test, and performance tests. The heat exchangers are cleaned internally with dry air/nitrogen. Sequentially, the sheet metal assembly is completed, heat exchangers are fitted, and compressor, fan motor, and electrical components are installed. Brazing is done to connect the mechanical refrigeration system. Post this the unit is tested for leakage using high pressure nitrogen/dry air and, after successful testing, is sent to evacuation and charging area. Before charging the refrigerant evacuation is completed to the level of 500 microns or less. In this process, After this step, the air-conditioner is again subjected to the leakage test, this time with the help of electronic leak detector. In case of leakage, cycle from pressure test onwards is repeated. Finally, the unit is subjected to performance tests and sent to packing and storage areas.

Baseline Equipment

Baseline Equipment	Sl. No.	Equipment	Make	Quantity	Year of installation
Pressure Testing & Leak detection	1	nitrogen leak testing	china	1 set	2002
	2	leak detection machine	china	1 set	2002
Evacuation System	1	Vacuum Pumps – stage I: multi van rotary type, 220 volt, 1/4 HP	Korea	2 sets	2002
	2	Vacuum Pumps – stage II: multi van rotary type, 220 volt, 1 HP	China	1 set	2007
Gas Charging	1	Gas charging machine	China	2 sets	2002
Testing Equipment	1	testing equipment	china	2 set	2002
	2	low voltage testing machine	china	1 set	2002
Leak detection	1	leak detection machine	china	1 set	2002
Packing Equipment	1	auto strapping machine	china	1 set	2002
	1	shearing machines	China	1	2005
	2	grinding machines	China	1	2007
	3	spot welding	China	1	2006
	4	top drill	China	1	2007
	5	power presses	China	1	2004
	8	welding machine	China	1	2014
	9	net bending machine	China	1	2015
	10	multi spot welding machine	China	1	2006
	16	table grinding machine	China	1	2005
Compressed Air	1	Air Compressor (s)	China	1	2002
Fire Safety Equipment	1	Fire extinguisher	China	1	2012

Equipment Action

S. N.	Equipment	Proposed action under the project
1	System redesign and prototype manufacturing and testing	Desk study, Development, and redesign
2	Assembly line modifications	
	Pressure testing equipment (modification of compressed air facility)	Retrofitting
	Vacuum pumps	New procurement
	Refrigerant charging equipment (station) - HFC-32	New procurement
	Fire safety equipment, sensors, alarm system including sprinklers for refrigerant storage and safety certificate	New procurement
	Industrial leak detectors etc.	New procurement
3	Recovery Station	New procurement
4	Quality inspection, finishing and testing modifications	-
5	Process, operation, maintenance and safety training	Safety training will be provided to staff
6	Technical assistance from external experts	Will be availed during redesign and implementation

Incremental Capital Costs and incremental operating cost

CHILLERS (HFC-32) conversion

COST CALCULATIONS

M/s. Cooling Point Engineering Services *(All figures in US$)*

No	Item	Unit Cost (US $)	Cooling Point	
			Quantities	Amount
	Date of Establishment : 1994			
	No. of Lines to be converted		1	
	No. of Units manufactured (2016) on the lines to be converted including units with 3TR to 10 TR capacity		405	
	HCFC-22 consumption (kg) (charge capacity ranging 3.5 Kgs to 12 Kgs)		2,353	
	Particulars			
1	System redesign and prototype manufacturing and testing	30,000	1	30,000
2	Assembly line modifications			
	Pressure testing equipment (modification of compressed air facility)	5,000	1	5,000
	Vacuum pumps	3,500	2	7,000
	Refrigerant charging equipment (station) - HFC-32	80,000	1	80,000
	Fire safety equipment, sensors, alarm system including sprinklers for refrigerant storage and safety certificate	15,000	1	15,000
	Industrial leak detectors etc.	7,500	1	7,500
3	Recovery Station	0	1	-
4	Quality inspection, finishing and testing modifications	5,000	1	5,000
5	Process, operation, maintenance and safety training	20,000	1	20,000
6	Technical assistance from external experts	20,000	1	20,000
Sub-total				189,500
Contingencies (10%)				18,950
Total (ICC)				208,450
Incremental Operating Costs				
No	Item			
1	Compressors (average)	55	405	22,275
2	Heat exchangers (Additional cost due to high wall thick)	-2	405	-810
3	Electrical Safety design	0	405	-
4	Refrigerant charge 20% less (average charge 6.11 Kg, reduced charge 4.93 Kgs)	-0.7	2,353	-1,647
Total (IOC)				19,818
Total eligible				14,824
Total Costs				
No	Item			
1	Incremental Capital Costs			208,450
2	Incremental Operating Costs			14,824
Total Costs				223,274
Less for non-A5 ownership				0
	Co-financing			100,000
	GRAND TOTAL			123,274

Total funds approved by MLF, combining the various heads under ICC and IOC

Cooling Point Engineering Services							
		Total Number of Chiller manufacture		405			
		Total HCFC-22 consumption (in MT)		2.35			
Level		ITEM	MLF Secretariat Nomenclature	Original Proposal			Negotiated final cost
				Unit Cost	Qty	Total Cost	
Investment - Conversion of Lines	1	System, component and process redesign and prototype manufacturing and testing	Assembly line for charging	30,000	1	30,000	50,000
	2	Pressure testing equipment (modification of compressed air facility)		5,000	1	5,000	
	3	Vacuum pumps		3,500	2	7,000	
	4	Refrigerant charging equipment (station) - HFC-32		80,000	1	80,000	
	5	Fire safety equipment, sensors, alarm system including sprinklers for storage and safety certificate		15,000	1	15,000	
	6	Industrial leak detectors etc.		7,500	1	7,500	
	7	Recovery Station		0	1	0	
	8	Quality inspection, finishing and testing modifications		5,000	1	5,000	
	9	Process, operation, maintenance and safety training		20,000	1	20,000	
	10	Technical assistance from external experts		20,000	1	20,000	
	11	Safety audit (condition: Safety Expert will be different from external expert)	Technical Assistance, installation, training and safety verification	0	1	0	5,000
	Sub Total ICC					**189,500**	**55,000**
	Contingencies 10%					**18,950**	**5,000**
IOC	1	Compressors		8	20,000	160,000	14,824
	2	Heat exchanger procurement price difference		2.08	20,000	41,600	
	3	Electrical and electronic PCB (Safety design)		7.6	20,000	152,000	
	4	Refrigerant - 65% less charge (average charge for 22 is 1.2 Kgs. and 0.35 kg of R290), the number of air conditioners manufactured		-1.82	20,000	-36,400	
	Sub-total IOC					**317,200**	**14,824**
						TOTAL ICC	**60,000**
						TOTAL IOC	**14,824**
						Total agreed cost	**74,824**
						COST-EFFECTIVINESS (USD/KG)	**31.84**

Annex II: Agreement Between the Executive Committee and the Government of Bangladesh approved at the 81st ExCom meeting

Annex VII

AGREEMENT BETWEEN THE GOVERNMENT OF BANGLADESH AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS IN ACCORDANCE WITH STAGE II OF THE HCFC PHASE-OUT MANAGEMENT PLAN

Purpose

1. This Agreement represents the understanding of the Government of Bangladesh (the "Country") and the Executive Committee with respect to the reduction of controlled use of the ozone-depleting substances (ODS) set out in Appendix 1-A ("The Substances") to a sustained level of 23.61 ODP tonnes by 1 January 2025 in compliance with Montreal Protocol schedule.

2. The Country agrees to meet the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A ("The Targets, and Funding") in this Agreement as well as in the Montreal Protocol reduction schedule for all Substances mentioned in Appendix 1-A. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in paragraph 3, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to any consumption of the Substances that exceeds the level defined in row 1.2 of Appendix 2-A as the final reduction step under this Agreement for all of the Substances specified in Appendix 1-A, and in respect to any consumption of each of the Substances that exceeds the level defined in rows 4.1.3, 4.2.3, 4.3.3, 4.4.3, and 4.5.3 (remaining consumption eligible for funding).

3. Subject to compliance by the Country with its obligations set out in this Agreement, the Executive Committee agrees, in principle, to provide the funding set out in row 3.1 of Appendix 2-A to the Country. The Executive Committee will, in principle, provide this funding at the Executive Committee meetings specified in Appendix 3-A ("Funding Approval Schedule").

4. The Country agrees to implement this Agreement in accordance with the stage II of the HCFC phase-out management plan (HPMP) approved ("the Plan"). In accordance with sub-paragraph 5(b) of this Agreement, the Country will accept independent verification of the achievement of the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A of this Agreement. The aforementioned verification will be commissioned by the relevant bilateral or implementing agency.

Conditions for funding release

5. The Executive Committee will only provide the Funding in accordance with the Funding Approval Schedule when the Country satisfies the following conditions at least eight weeks in advance of the applicable Executive Committee meeting set out in the Funding Approval Schedule:

(a) That the Country has met the Targets set out in row 1.2 of Appendix 2-A for all relevant years. Relevant years are all years since the year in which this Agreement was approved. Years for which there are no due country programme implementation reports at the date of the Executive Committee meeting at which the funding request is being presented are exempted;

(b) That the meeting of these Targets has been independently verified for all relevant years, unless the Executive Committee decided that such verification would not be required;

(c) That the Country had submitted a Tranche Implementation Report in the form of Appendix 4-A ("Format of Tranche Implementation Reports and Plans") covering each previous calendar year; that it had achieved a significant level of implementation of activities initiated with previously approved tranches; and that the rate of disbursement of funding available from the previously approved tranche was more than 20 per cent; and

(d) That the Country has submitted a Tranche Implementation Plan in the form of Appendix 4-A covering each calendar year until and including the year for which the funding schedule foresees the submission of the next tranche or, in case of the final tranche, until completion of all activities foreseen.

Monitoring

6. The Country will ensure that it conducts accurate monitoring of its activities under this Agreement. The institutions set out in Appendix 5-A ("Monitoring Institutions and Roles") will monitor and report on implementation of the activities in the previous Tranche Implementation Plans in accordance with their roles and responsibilities set out in the same appendix.

Flexibility in the reallocation of funds

7. The Executive Committee agrees that the Country may have the flexibility to reallocate part or all of the approved funds, according to the evolving circumstances to achieve the smoothest reduction of consumption and phase-out of the Substances specified in Appendix 1-A:

(a) Reallocations categorized as major changes must be documented in advance either in a Tranche Implementation Plan as foreseen in sub-paragraph 5(d) above, or as a revision to an existing Tranche Implementation Plan to be submitted eight weeks prior to any meeting of the Executive Committee, for its approval. Major changes would relate to:

(i) Issues potentially concerning the rules and policies of the Multilateral Fund;

(ii) Changes which would modify any clause of this Agreement;

(iii) Changes in the annual levels of funding allocated to individual bilateral or implementing agencies for the different tranches;

(iv) Provision of funding for activities not included in the current endorsed Tranche Implementation Plan, or removal of an activity in the Tranche Implementation Plan, with a cost greater than 30 per cent of the total cost of the last approved tranche; and

(v) Changes in alternative technologies, on the understanding that any submission for such a request would identify the associated incremental costs, the potential impact to the climate, and any differences in ODP tonnes to be phased out if applicable, as well as confirm that the Country agrees that potential savings related to the change of technology would decrease the overall funding level under this Agreement accordingly;

(b) Reallocations not categorized as major changes may be incorporated in the approved Tranche Implementation Plan, under implementation at the time, and reported to the Executive Committee in the subsequent Tranche Implementation Report;

(c) Any enterprise to be converted to non-HCFC technology included in the Plan and that would be found to be ineligible under the policies of the Multilateral Fund (i.e., due to foreign ownership or establishment post the 21 September 2007 cut-off date), would not receive financial assistance. This information would be reported as part of the Tranche Implementation Plan;

(d) The Country commits to examining the possibility of using pre-blended systems with low-global warming potential blowing agents instead of blending them in-house, for those foam enterprises covered under the Plan, should this be technically viable, economically feasible and acceptable to the enterprises;

(e) The Country agrees, in cases where HFC technologies have been chosen as an alternative to HCFCs, and taking into account national circumstances related to health and safety: to monitor the availability of substitutes and alternatives that further minimize impacts on the climate; to consider, in the review of regulations, standards and incentives adequate provisions that encourage introduction of such alternatives; and to consider the potential for adoption of cost-effective alternatives that minimize the climate impact in the implementation of the HPMP, as appropriate, and inform the Executive Committee on the progress accordingly in tranche implementation reports; and

(f) Any remaining funds held by the bilateral or implementing agencies or the Country under the Plan will be returned to the Multilateral Fund upon completion of the last tranche foreseen under this Agreement.

Considerations for the refrigeration servicing sector

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

(a) The Country would use the flexibility available under this Agreement to address specific needs that might arise during project implementation; and

(b) The Country and relevant bilateral and/or implementing agencies would take into consideration relevant decisions on the refrigeration servicing sector during the implementation of the Plan.

Bilateral and implementing agencies

9. The Country agrees to assume overall responsibility for the management and implementation of this Agreement and of all activities undertaken by it or on its behalf to fulfil the obligations under this Agreement. UNDP has agreed to be the lead implementing agency (the "Lead IA") and UNEP has agreed to be the cooperating implementing agency (the "Cooperating IA") under the lead of the Lead IA in respect of the Country's activities under this Agreement. The Country agrees to evaluations, which might be carried out under the monitoring and evaluation work programmes of the Multilateral Fund or under the evaluation programme of the Lead IA and Cooperating IA taking part in this Agreement.

10. The Lead IA will be responsible for ensuring co-ordinated planning, implementation and reporting of all activities under this Agreement, including but not limited to independent verification as per sub-paragraph 5(b). The Cooperating IA will support the Lead IA by implementing the Plan under the overall co-ordination of the Lead IA. The roles of the Lead IA and Cooperating IA are contained in Appendix 6-A and Appendix 6-B, respectively. The Executive Committee agrees, in principle, to provide the Lead IA and the Cooperating IA with the fees set out in rows 2.2 and 2.4 of Appendix 2-A.

Non-compliance with the Agreement

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

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

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

Date of completion

14. The completion of the Plan and the associated Agreement will take place at the end of the year following the last year for which a maximum allowable total consumption level has been specified in Appendix 2-A. Should at that time there still be activities that are outstanding, and which were foreseen in the last Tranche Implementation Plan and its subsequent revisions as per sub-paragraph 5(d) and paragraph 7, the completion of the Plan will be delayed until the end of the year following the implementation of the remaining activities. The reporting requirements as per sub-paragraphs 1(a), 1(b), 1(d), and 1(e) of Appendix 4-A will continue until the time of the completion of the Plan unless otherwise specified by the Executive Committee.

Validity

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

16. This Agreement may be modified or terminated only by mutual written agreement of the Country and the Executive Committee of the Multilateral Fund.

APPENDICES

APPENDIX 1-A: THE SUBSTANCES

Substance	Annex	Group	Starting point for aggregate reductions in consumption (ODP tonnes)
HCFC-22	C	I	45.42
HCFC-141b	C	I	21.23
HCFC-142b	C	I	5.72
HCFC-123	C	I	0.21
HCFC-124	C	I	0.07
Total	C	I	72.65

APPENDIX 2-A: THE TARGETS, AND FUNDING

Row	Particulars	2018	2019	2020	2021	2022	2023	2024	2025	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	65.39	65.39	47.22	47.22	47.22	47.22	47.22	23.61	n/a
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	50.86	50.86	47.22	47.22	47.22	30.50	26.50	23.61	n/a
2.1	Lead IA (UNDP) agreed funding (US $)	2,142,405	0	2,142,405	0	1,071,204	0	0	0	5,356,014
2.2	Support costs for Lead IA (US $)	149,968	0	149,968	0	74,985	0	0	0	374,921
2.3	Cooperating IA (UNEP) agreed funding (US $)	360,000	0	0	0	120,400	0	0	54,280	534,680
2.4	Support costs for Cooperating IA (US $)	46,333	0	0	0	15,496	0	0	6,986	68,815
3.1	Total agreed funding (US $)	2,502,405	0	2,142,405	0	1,191,603	0	0	54,280	5,890,694
3.2	Total support costs (US $)	196,301	0	149,968	0	90,481	0	0	6,986	433,736
3.3	Total agreed costs (US $)	2,698,706	0	2,292,374	0	1,282,084	0	0	61,266	6,334,430
4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes)									18.86
4.1.2	Phase-out of HCFC-22 to be achieved in the previous stage (ODP tonnes)									3.48
4.1.3	Remaining eligible consumption for HCFC-22 (ODP tonnes)									23.08
4.2.1	Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes)									0.00
4.2.2	Phase-out of HCFC-141b to be achieved in the previous stage (ODP tonnes)									20.2
4.2.3	Remaining eligible consumption for HCFC-141b (ODP tonnes)**									1.03

Row	Particulars	2018	2019	2020	2021	2022	2023	2024	2025	Total
4.3.1	Total phase-out of HCFC-142b agreed to be achieved under this Agreement (ODP tonnes)									5.15
4.3.2	Phase-out of HCFC-142b to be achieved in the previous stage (ODP tonnes)									0.57
4.3.3	Remaining eligible consumption for HCFC-142b (ODP tonnes)									0.00
4.4.1	Total phase-out of HCFC-123 agreed to be achieved under this Agreement (ODP tonnes)									0.00
4.4.2	Phase-out of HCFC-123 to be achieved in the previous stage (ODP tonnes)									0.21
4.4.3	Remaining eligible consumption for HCFC-123 (ODP tonnes)									0.00
4.5.1	Total phase-out of HCFC-124 agreed to be achieved under this Agreement (ODP tonnes)									0.00
4.5.2	Phase-out of HCFC-124 to be achieved in the previous stage (ODP tonnes)									0.07
4.5.3	Remaining eligible consumption for HCFC-124 (ODP tonnes)									0.00

* Date of completion of stage I as per stage I Agreement: 1 January 2018
** Consumption of HCFC-141b is nil as the Government has imposed a ban on imported bulk HCFC-141b.

APPENDIX 3-A: FUNDING APPROVAL SCHEDULE

1. Funding for the future tranches will be considered for approval at the second meeting of the year specified in Appendix 2-A.

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

1. The submission of the Tranche Implementation Report and Plans for each tranche request will consist of five parts:

(a) A narrative report, with data provided by tranche, describing the progress achieved since the previous report, reflecting the situation of the Country in regard to phase out of the Substances, how the different activities contribute to it, and how they relate to each other. The report should include the amount of ODS phased out as a direct result from the implementation of activities, by substance, and the alternative technology used and the related phase-in of alternatives, to allow the Secretariat to provide to the Executive Committee information about the resulting change in climate relevant emissions. The report should further highlight successes, experiences, and challenges related to the different activities included in the Plan, reflecting any changes in the circumstances in the Country, and providing other relevant information. The report should also include information on and justification for any changes vis-à-vis the previously submitted Tranche Implementation Plan(s), such as delays, uses of the flexibility for reallocation of funds during implementation of a tranche, as provided for in paragraph 7 of this Agreement, or other changes;

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

(c) A written description of the activities to be undertaken during the period covered by the requested tranche, highlighting implementation milestones, the time of completion and the interdependence of the activities, and taking into account experiences made and progress achieved in the implementation of earlier tranches; the data in the plan will be provided by calendar year. The description should also include a reference to the overall Plan and progress achieved, as well as any possible changes to the overall Plan that are foreseen. The description should also specify and explain in detail such changes to the overall plan. This

description of future activities can be submitted as a part of the same document as the narrative report under sub-paragraph (b) above;

(d) A set of quantitative information for all Tranche Implementation Reports and Plans, submitted through an online database; and

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

2. In the event that in a particular year two stages of the HPMP are being implemented in parallel, the following considerations should be taken in preparing the Tranche Implementation Reports and Plans:

(a) The Tranche Implementation Reports and Plans referred to as part of this Agreement, will exclusively refer to activities and funds covered by this Agreement; and

(b) If the stages under implementation have different HCFC consumption targets under Appendix 2-A of each Agreement in a particular year, the lower HCFC consumption target will be used as reference for compliance with these Agreements and will be the basis for the independent verification.

APPENDIX 5-A: MONITORING INSTITUTIONS AND ROLES

1. The overall monitoring will be the responsibility of National Ozone Unit (NOU). The consumption will be monitored on cross-checking the data collected from relevant government departments with data collected, as required, from the relevant importers, distributors and consumers. The NOU will also be responsible for reporting and shall submit the following reports in timely manner:

(a) Annual reports on consumption of substances to be submitted to the Ozone Secretariat;

(b) Annual reports on the progress of implementation of this Agreement to be submitted to the Executive Committee of the Multilateral Fund; and

(c) Project -related reports to the Lead IA.

APPENDIX 6-A: ROLE OF THE LEAD IMPLEMENTING AGENCY

1. The Lead IA will be responsible for a range of activities, including at least the following:

(a) Ensuring performance and financial verification in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country's HPMP;

(b) Assisting the Country in preparation of the Tranche Implementation Reports and Plans as per Appendix 4-A;

(c) Providing independent verification to the Executive Committee that the Targets have been met and associated tranche activities have been completed as indicated in the Tranche Implementation Plan consistent with Appendix 4-A;

(d) Ensuring that the experiences and progress is reflected in updates of the overall plan and in future Tranche Implementation Plans consistent with sub-paragraphs 1(c) and 1(d) of Appendix 4-A;

(e) Fulfilling the reporting requirements for the Tranche Implementation Reports and Plans and the overall plan as specified in Appendix 4-A for submission to the Executive Committee, and should include the activities implemented by the Cooperating IA;

(f) In the event that the last funding tranche is requested one or more years prior to the last year for which a consumption target had been established, annual tranche implementation reports and, where applicable, verification reports on the current stage of the Plan should be submitted until all activities foreseen had been completed and HCFC consumption targets had been met;

(g) Ensuring that appropriate independent technical experts carry out the technical reviews;

(h) Carrying out required supervision missions;

(i) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Tranche Implementation Plan and accurate data reporting;

(j) Co-ordinating the activities of the Cooperating IA, and ensuring appropriate sequence of activities;

(k) In case of reductions in funding for failure to comply in accordance with paragraph 11 of the Agreement, to determine, in consultation with the Country and the Cooperating IA, the allocation of the reductions to the different budget items and to the funding of the Lead IA and Cooperating IA;

(l) Ensuring that disbursements made to the Country are based on the use of the indicators;

(m) Providing assistance with policy, management and technical support when required;

(n) Reaching consensus with the Cooperating IA on any planning, co-ordination and reporting arrangements required to facilitate the implementation of the Plan; and

(o) Timely releasing funds to the Country/participating enterprises for completing the activities related to the project.

2. After consultation with the Country and taking into account any views expressed, the Lead IA will select and mandate an independent entity to carry out the verification of the HPMP results and the consumption of the Substances mentioned in Appendix 1-A, as per sub-paragraph 5(b) of the Agreement and sub-paragraph 1(b) of Appendix 4-A.

APPENDIX 6-B: ROLE OF THE COOPERATING IMPLEMENTING AGENCIES

1. The Cooperating IA will be responsible for a range of activities. These activities are specified in the Plan, including at least the following:

(a) Providing assistance for policy development when required;

(b) Assisting the Country in the implementation and assessment of the activities funded by the Cooperating IA, and refer to the Lead IA to ensure a co-ordinated sequence in the activities;

(c) Providing reports to the Lead IA on these activities, for inclusion in the consolidated reports as per Appendix 4-A; and

(d) Reaching consensus with the Lead IA on any planning, co-ordination and reporting arrangements required to facilitate the implementation of the Plan.

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

1. In accordance with paragraph 11 of the Agreement, the amount of funding provided may be reduced by US $490.7 per ODP kg of consumption beyond the level defined in row 1.2 of Appendix 2-A for each year in which the target specified in row 1.2 of Appendix 2-A has not been met, on the understanding that the maximum funding reduction would not exceed the funding level of the tranche being requested. Additional measures might be considered in cases where non-compliance extends for two consecutive years.

2. In the event that the penalty needs to be applied for a year in which there are two Agreements in force (two stages of the HPMP being implemented in parallel) with different penalty levels, the application of the penalty will be determined on a case-by-case basis taking into consideration the specific sectors that lead to the non-compliance. If it is not possible to determine a sector, or both stages are addressing the same sector, the penalty level to be applied would be the largest.

ANNEX III: PROJECT QUALITY ASSURANCE REPORT

PROJECT QA ASSESSMENT: DESIGN AND APPRAISAL

OVERALL PROJECT

EXEMPLARY (5) ¥¥¥¥¥	HIGHLY SATISFACTORY (4) ¥¥¥¥¡	SATISFACTORY (3) ¥¥¥¡¡	NEEDS IMPROVEMENT (2) ¥¥¡¡¡	INADEQUATE (1) ¥¡¡¡¡
At least four criteria are rated Exemplary, and all criteria are rated High or Exemplary.	All criteria are rated Satisfactory or higher, and at least four criteria are rated High or Exemplary.	At least six criteria are rated Satisfactory or higher, and only one may be rated Needs Improvement. The SES criterion must be rated Satisfactory or above.	At least three criteria are rated Satisfactory or higher, and only four criteria may be rated Needs Improvement.	One or more criteria are rated Inadequate, or five or more criteria are rated Needs Improvement.

DECISION

- **APPROVE** – the project is of sufficient quality to continue as planned**.** Any management actions must be addressed in a timely manner.
- **APPROVE WITH QUALIFICATIONS** – the project has issues that must be addressed before the project document can be approved. Any management actions must be addressed in a timely manner.
- **DISAPPROVE** – the project has significant issues that should prevent the project from being approved as drafted.

RATING CRITERIA

STRATEGIC

1. Does the project's Theory of Change specify how it will contribute to higher level change? (Select the option from 1-3 that best reflects the project): • **3:** The project has a theory of change with explicit assumptions and clear change pathway describing how the project will contribute to outcome level change as specified in the programme/CPD, backed by credible evidence of what works effectively in this context. The project document clearly describes why the project's strategy is the best approach at this point in time. • **2:** The project has a theory of change. It has an explicit change pathway that explains how the project intends to contribute to outcome-level change and why the project strategy is the best approach at this point in time, but is backed by limited evidence. • **1:** The project does not have a theory of change, but the project document may describe in generic terms how the project will contribute to development results, without specifying the key assumptions. It does not make an explicit link to the programme/CPD's theory of change. *Note: Management Action or strong management justification must be given for a score of 1	3	2
	1	
	3 **Evidence** The project is implemented in accordance with the Montreal Protocol on Substances that deplete the ozone layer. Bangladesh is a member country that ratified the MP and its all amendments. Bangladesh also has the obligation to reduce and phase out of HCFCs in accordance with scheduled targets as per Agreement Annex II of UNEP/OzL.Pro/ExCom/81/58.	
2. Is the project aligned with the thematic focus of the UNDP Strategic Plan? (select the option from 1-3 that best reflects the project): • **3:** The project responds to one of the three areas of development work[8] as specified in the Strategic Plan; it addresses at least one of the proposed new and emerging areas[9]; an issues-based analysis has been incorporated into the project design; and the project's RRF includes all the relevant SP output indicators. *(all must be true to select this option)* • **2:** The project responds to one of the three areas of development work[1] as specified in the Strategic Plan. The project's RRF includes at least one SP output indicator, if relevant. *(both must be true to select this option)* • **1:** While the project may respond to one of the three areas of development work[1] as specified in the Strategic Plan, it is based on a sectoral approach without addressing the complexity of the development issue. None of the relevant SP indicators are included in the RRF. This answer is also selected if the project does not respond to any of the three areas of development work in the Strategic Plan.	**3**	2
	1	
	3 **Evidence** The project will contribute to Special Programme Outcome 2 as mentioned in project document Section V. The project is linked to the SP area 1 and the New Emerging Area 1: Sustainable Production Technologies	

[8] 1. Sustainable development pathways; 2. Inclusive and effective democratic governance; 3. Resilience building

[9] sustainable production technologies, access to modern energy services and energy efficiency, natural resources management, extractive industries, urbanization, citizen security, social protection, and risk management for resilience

RELEVANT

3. Does the project have strategies to effectively identify, engage and ensure the meaningful participation of targeted groups/geographic areas with a priority focus on the excluded and marginalized? (select the option from 1-3 that best reflects this project):

- **3:** The target groups/geographic areas are appropriately specified, prioritising the excluded and/or marginalised. Beneficiaries will be identified through a rigorous process based on evidence (if applicable). The project has an explicit strategy to identify, engage and ensure the meaningful participation of specified target groups/geographic areas throughout the project, including through monitoring and decision-making (such as representation on the PSC) *(all must be true to select this option)*
- **2:** The target groups/geographic areas are appropriately specified, prioritising the excluded and/or marginalised. The project document states how beneficiaries will be identified, engaged and how meaningful participation will be ensured throughout the project. *(both must be true to select this option)*
- **1:** The target groups/geographic areas are not specified, or do not prioritize excluded and/or marginalised populations. The project does not have a written strategy to identify or engage or ensure the meaningful participation of the target groups/geographic areas throughout the project.

*Note: Management Action must be taken for a score of 1, or select not applicable.

3	2
1	

3

Evidence

The target groups (all are in RAC sector) are properly identified through an in-depth assessment carried out in collaboration with national and international partners.

The project has a stated focus on small and medium enterprises

4. Have knowledge, good practices, and past lessons learned of UNDP and others informed the project design? (select the option from 1-3 that best reflects this project):

- **3:** Knowledge and lessons learned (gained e.g. through peer assist sessions) backed by credible evidence from evaluation, corporate policies/strategies, and monitoring have been explicitly used, with appropriate referencing, to develop the project's theory of change and justify the approach used by the project over alternatives.
- **2:** The project design mentions knowledge and lessons learned backed by evidence/sources, which inform the project's theory of change but have not been used/are not sufficient to justify the approach selected over alternatives.
- **1:** There is only scant, or no mention of knowledge and lessons learned informing the project design. Any references that are made are not backed by evidence.

*Note: Management Action or strong management justification must be given for a score of 1

3	**2**
1	

2

Evidence

The Project builds on and learns from a predecesor Project (in Walton Hi-Tech Industries Ltd.) successfully implemented. However, it is still a challenge for small and medium companies (SMEs) to apply it in their production lines.

5. Does the project use gender analysis in the project design and does the project respond to this gender analysis with concrete measures to address gender inequities and empower women? (select the option from 1-3 that best reflects this project):

- **3:** A participatory gender analysis on the project has been conducted. This analysis reflects on the different needs, roles and access to/control over resources of women and men, and it is fully integrated into the project document. The project establishes concrete priorities to address gender inequalities in its strategy. The results framework includes outputs and activities that specifically respond to this gender analysis, with indicators that measure and monitor results contributing to gender equality. *(all must be true to select this option)*
- **2:** A gender analysis on the project has been conducted. This analysis reflects on the different needs, roles and access to/control over resources of women and men. Gender concerns are integrated in the development challenge and strategy sections of the project document. The results framework includes outputs and activities that specifically respond to this gender analysis, with indicators that measure and monitor results contributing to gender equality. *(all must be true to select this option)*
- **1:** The project design may or may not mention information and/or data on the differential impact of the project's development situation on gender relations, women and men, but the constraints have not been clearly identified and interventions have not been considered.

*Note: Management Action or strong management justification must be given for a score of 1

3	2
1	

1

Evidence

Management Action: During the start of the project identification of possible actions will be taken to incorporate the women inclusion and empowerment. About 30-40% female participation Will be ensured in all training programme.

6. Does UNDP have a clear advantage to engage in the role envisioned by the project vis-à-vis national partners, other development partners, and other actors? (select from options 1-3 that best reflects this project):

- **3:** An analysis has been conducted on the role of other partners in the area where the project intends to work, and credible evidence supports the proposed engagement of UNDP and partners through the project. It is clear how results achieved by relevant partners will contribute to outcome level change

3	2
1	

2

Evidence

The project is dealing with the advantages of its network promoted by

complementing the project's intended results. If relevant, options for south-south and triangular cooperation have been considered, as appropriate. *(all must be true to select this option)* • **2:** Some analysis has been conducted on the role of other partners where the project intends to work, and relatively limited evidence supports the proposed engagement of and division of labour between UNDP and partners through the project. Options for south-south and triangular cooperation may not have not been fully developed during project design, even if relevant opportunities have been identified. • **1:** No clear analysis has been conducted on the role of other partners in the area that the project intends to work, and relatively limited evidence supports the proposed engagement of UNDP and partners through the project. There is risk that the project overlaps and/or does not coordinate with partners' interventions in this area. Options for south-south and triangular cooperation have not been considered, despite its potential relevance. *Note: Management Action or strong management justification must be given for a score of 1	UNDP and UNEP at regional and global level. It shares the results and lessons learned with others. Furthermore, it facilitates the potential bilateral networks between UNDP and the country

SOCIAL & ENVIRONMENTAL STANDARDS

7. Does the project seek to further the realization of human rights using a human rights-based approach? (select from options 1-3 that best reflects this project): • **3:** Credible evidence that the project aims to further the realization of human rights, upholding the relevant international and national laws and standards in the area of the project. Any potential adverse impacts on enjoyment of human rights were rigorously identified and assessed as relevant, with appropriate mitigation and management measures incorporated into project design and budget. *(all must be true to select this option)* • **2:** Some evidence that the project aims to further the realization of human rights. Potential adverse impacts on enjoyment of human rights were identified and assessed as relevant, and appropriate mitigation and management measures incorporated into the project design and budget. • **1:** No evidence that the project aims to further the realization of human rights. Limited or no evidence that potential adverse impacts on enjoyment of human rights were considered. *Note: Management action or strong management justification must be given for a score of 1	3 / 2 / 1 **3** **Evidence** The project contributes to the global efforts to safeguard the environment and protect humans (particularly the poor) from the impacts of climate change
8. Did the project consider potential environmental opportunities and adverse impacts, applying a precautionary approach? (select from options 1-3 that best reflects this project): • **3:** Credible evidence that opportunities to enhance environmental sustainability and integrate poverty-environment linkages were fully considered as relevant and integrated in project strategy and design. Credible evidence that potential adverse environmental impacts have been identified and rigorously assessed with appropriate management and mitigation measures incorporated into project design and budget. *(all must be true to select this option)*. • **2:** No evidence that opportunities to strengthen environmental sustainability and poverty-environment linkages were considered. Credible evidence that potential adverse environmental impacts have been identified and assessed, if relevant, and appropriate management and mitigation measures incorporated into project design and budget. • **1:** No evidence that opportunities to strengthen environmental sustainability and poverty-environment linkages were considered. Limited or no evidence that potential adverse environmental impacts were adequately considered. *Note: Management action or strong management justification must be given for a score of 1	3 / 2 / 1 **3** **Evidence** The project aims to support the environmental sustainability and to reduce/avoid the impacts of Ozone layer depletion and global warming (Climate change). In consequence, the vulnerable groups of people will get the opportunity to gain cleaner environment and healthier life.
9. Has the Social and Environmental Screening Procedure (SESP) been conducted to identify potential social and environmental impacts and risks? The SESP is not required for projects in which UNDP is Administrative Agent only and/or projects comprised solely of reports, coordination of events, trainings, workshops, meetings, conferences and/or communication materials and information dissemination. [if yes, upload the completed checklist. If SESP is not required, provide the reason for the exemption in the evidence section.]	Yes / No Yes, SESP is attached as Appendix A of Project Document

MANAGEMENT & MONITORING

10. Does the project have a strong results framework? (select from options 1-3 that best reflects this project):

- **3:** The project's selection of outputs and activities are at an appropriate level and relate in a clear way to the project's theory of change. Outputs are accompanied by SMART, results-oriented indicators that measure all of the key expected changes identified in the theory of change, each with credible data sources, and populated baselines and targets, including gender sensitive, sex-disaggregated indicators where appropriate. *(all must be true to select this option)*
- **2:** The project's selection of outputs and activities are at an appropriate level but may not cover all aspects of the project's theory of change. Outputs are accompanied by SMART, results-oriented indicators, but baselines, targets and data sources may not yet be fully specified. Some use of gender sensitive, sex-disaggregated indicators, as appropriate. *(all must be true to select this option)*
- **1:** The results framework does not meet all of the conditions specified in selection "2" above. This includes: the project's selection of outputs and activities are not at an appropriate level and do not relate in a clear way to the project's theory of change; outputs are not accompanied by SMART, results-oriented indicators that measure the expected change, and have not been populated with baselines and targets; data sources are not specified, and/or no gender sensitive, sex-disaggregation of indicators.

*Note: Management Action or strong management justification must be given for a score of 1

3	2
1	

3

Evidence

Reduction and phase-out of ODS that contain ODP and GWP in accordance with MP. For more please see

Project document (Section V)

11. Is there a comprehensive and costed M&E plan in place with specified data collection sources and methods to support evidence-based management, monitoring and evaluation of the project? (Evidence: Project document Section VI)

Yes (3)	No (1)

12. Is the project's governance mechanism clearly defined in the project document, including planned composition of the PSC? (select from options 1-3 that best reflects this project):

- **3:** The project's governance mechanism is fully defined in the project composition. Individuals have been specified for each position in the governance mechanism (especially all members of the PSC). PSC members have agreed on their roles and responsibilities as specified in the terms of reference. The ToR of the PSC has been attached to the project document. *(all must be true to select this option)*.
- **2:** The project's governance mechanism is defined in the project document; specific institutions are noted as holding key governance roles, but individuals may not have been specified yet. The prodoc lists the most important responsibilities of the PSC, project director/manager and quality assurance roles. *(all must be true to select this option)*
- **1:** The project's governance mechanism is loosely defined in the project document, only mentioning key roles that will need to be filled at a later date. No information on the responsibilities of key positions in the governance mechanism is provided.

*Note: Management Action or strong management justification must be given for a score of 1

3	2
1	

2

Evidence

Project document (Sections IV and VIII)

13. Have the project risks been identified with clear plans stated to manage and mitigate each risks? (select from options 1-3 that best reflects this project):

- **3:** Project risks related to the achievement of results are fully described in the project risk log, based on comprehensive analysis drawing on the theory of change, Social and Environmental Standards and screening, situation analysis, capacity assessments and other analysis. Clear and complete plan in place to manage and mitigate each risk. *(both must be true to select this option)*
- **2:** Project risks related to the achievement of results identified in the initial project risk log with mitigation measures identified for each risk.
- **1:** Some risks may be identified in the initial project risk log, but no evidence of analysis and no clear risk mitigation measures identified. This option is also selected if risks are not clearly identified and no initial risk log is included with the project document.

*Note: Management Action must be taken for a score of 1

3	2
1	

2

Evidence

Project document (Section III and annex XIII)

EFFICIENT

14. Have specific measures for ensuring cost-efficient use of resources been explicitly mentioned as part of the project design? This can include: i) using the theory of change analysis to explore different options of achieving the maximum results with the resources available; ii) using a portfolio management approach to improve cost effectiveness through synergies with other interventions; iii) through joint operations (e.g., monitoring or procurement) with other partners. Evidence: Project document Section IV	**Yes (3)**	No (1)
15. Are explicit plans in place to ensure the project links up with other relevant on-going projects and initiatives, whether led by UNDP, national or other partners, to achieve more efficient results (including, for example, through sharing resources or coordinating delivery?) Evidence: Project document Section IV	**Yes (3)**	No (1)

16. Is the budget justified and supported with valid estimates?

- **3:** The project's budget is at the activity level with funding sources and is specified for the duration of the project period in a multi-year budget. Costs are supported with valid estimates using benchmarks from similar projects or activities. Cost implications from inflation and foreign exchange exposure have been estimated and incorporated in the budget.
- **2:** The project's budget is at the activity level with funding sources, when possible, and is specified for the duration of the project in a multi-year budget. Costs are supported with valid estimates based on prevailing rates.
- **1:** The project's budget is not specified at the activity level, and/or may not be captured in a multi-year budget.

3	2
1	

2

Evidence

Project proposal approved by Multilateral Fund (Annex I)

17. Is the Country Office fully recovering the costs involved with project implementation?

- **3:** The budget fully covers all project costs that are attributable to the project, including programme management and development effectiveness services related to strategic country programme planning, quality assurance, pipeline development, policy advocacy services, finance, procurement, human resources, administration, issuance of contracts, security, travel, assets, general services, information and communications based on full costing in accordance with prevailing UNDP policies (i.e., UPL, LPL.)
- **2:** The budget covers significant project costs that are attributable to the project based on prevailing UNDP policies (i.e., UPL, LPL) as relevant.
- **1:** The budget does not adequately cover project costs that are attributable to the project, and UNDP is cross-subsidizing the project.

*Note: Management Action must be given for a score of 1. The budget must be revised to fully reflect the costs of implementation before the project commences.

3	2
3	

Evidence

Project work plan and budget table indicating the support cost allocated to UNDP.

EFFECTIVE

18. Is the chosen implementation modality most appropriate? (select from options 1-3 that best reflects this project):

- **3:** The required implementing partner assessments (capacity assessment, HACT micro assessment) have been conducted, and there is evidence that options for implementation modalities have been thoroughly considered. There is a strong justification for choosing the selected modality, based on the development context. *(both must be true to select this option)*
- **2:** The required implementing partner assessments (capacity assessment, HACT micro assessment) have been conducted and the implementation modality chosen is consistent with the results of the assessments.
- **1:** The required assessments have not been conducted, but there may be evidence that options for implementation modalities have been considered.

*Note: Management Action or strong management justification must be given for a score of 1

3	2
3	

Evidence

The partnership arrangement is a continuation of the project HFC Phase down at Walton which is successfully implemented towards the attainment of the intended results/milestones

19. Have targeted groups, prioritizing marginalized and excluded populations that will be affected by the project, been engaged in the design of the project in a way that addresses any underlying causes of exclusion and discrimination? • 3: Credible evidence that all targeted groups, prioritising marginalized and excluded populations that will be involved in or affected by the project, have been actively engaged in the design of the project. Their views, rights and any constraints have been analysed and incorporated into the root cause analysis of the theory of change which seeks to address any underlying causes of exclusion and discrimination and the selection of project interventions. • 2: Some evidence that key targeted groups, prioritising marginalized and excluded populations that will be involved in the project, have been engaged in the design of the project. Some evidence that their views, rights and any constraints have been analysed and incorporated into the root cause analysis of the theory of change and the selection of project interventions. • 1: No evidence of engagement with marginalized and excluded populations that will be involved in the project during project design. No evidence that the views, rights and constraints of populations have been incorporated into the project.	3	2
	1	
	2 **Evidence** Project document Section I	
20. Does the project conduct regular monitoring activities, have explicit plans for evaluation, and include other lesson learning (e.g. through After-Action Reviews or Lessons Learned Workshops), timed to inform course corrections if needed during project implementation? **Evidence:** Project document Section VI	**Yes (3)**	
21. The gender marker for all project outputs are scored at GEN2 or GEN3, indicating that gender has been fully mainstreamed into all project outputs at a minimum. *Note: Management Action or strong management justification must be given for a score of "no" ***Actions to take:*** *During the start of the project identification of possible actions to incorporate the gender issues in the project will be done.*		**No (1)**
	1 **Evidence**	
22. Is there a realistic multi-year work plan and budget to ensure outputs are delivered on time and within allotted resources? (select from options 1-3 that best reflects this project): • **3:** The project has a realistic work plan & budget covering the duration of the project *at the activity* level to ensure outputs are delivered on time and within the allotted resources. • **2:** The project has a work plan & budget covering the duration of the project at the output level. • **1:** The project does not yet have a work plan & budget covering the duration of the project.	3	2
	1	
	3 **Evidence** Project document approved by Multilateral Fund (Annex I)	
SUSTAINABILITY & NATIONAL OWNERSHIP		
23. Have national partners led, or proactively engaged in, the design of the project? (select from options 1-3 that best reflects this project): • **3:** National partners have full ownership of the project and led the process of the development of the project jointly with UNDP. • **2:** The project has been developed by UNDP in close consultation with national partners. • **1:** The project has been developed by UNDP with limited or no engagement with national partners.	3	2
	3	
	Evidence The NOU has been fully involved in the design of the project document	

24. Are key institutions and systems identified, and is there a strategy for strengthening specific/ comprehensive capacities based on capacity assessments conducted? (select from options 0-4 that best reflects this project): • **3:** The project has a comprehensive strategy for strengthening specific capacities of national institutions based on a systematic and detailed capacity assessment that has been completed. This strategy includes an approach to regularly monitor national capacities using clear indicators and rigorous methods of data collection and adjust the strategy to strengthen national capacities accordingly. • **2.5:** A capacity assessment has been completed. The project document has identified activities that will be undertaken to strengthen capacity of national institutions, but these activities are not part of a comprehensive strategy to monitor and strengthen national capacities. • **2:** A capacity assessment is planned after the start of the project. There are plans to develop a strategy to strengthen specific capacities of national institutions based on the results of the capacity assessment. • **1.5:** There is mention in the project document of capacities of national institutions to be strengthened through the project, but no capacity assessments or specific strategy development are planned. • **1:** Capacity assessments have not been carried out and are not foreseen. There is no strategy for strengthening specific capacities of national institutions.	3	2.5
	2	1.5
	1	
	3 **Evidence** Project activities and results will be under surveillance of the NOU committee, a multisector body overseeing the activities under the Montreal Protocol	
25. Is there is a clear strategy embedded in the project specifying how the project will use national systems (i.e., procurement, monitoring, evaluations, etc.,) to the extent possible? Evidence: Project document Section IV	**Yes (3)**	
26. Is there a clear transition arrangement/ phase-out plan developed with key stakeholders in order to sustain or scale up results (including resource mobilisation strategy)?	Yes (3)	

ANNEX IV: SOCIAL AND ENVIRONMENTAL SCREENING TEMPLATE (SESP)

Project Information

Project Information	
1. Project Title	1) **HCFC Phase-Out Management Plan (HPMP Stage-II) For Compliance with the 2020 and 2025 Control Targets**
1. Project Number	Output ID- 00110796 (AC Sector) and 00117012 (PMU). Award ID- 00112138
1. Location (Global/Region/Country)	Bangladesh

Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

QUESTION 1: How Does the Project Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?
Briefly describe in the space below how the Project mainstreams the human-rights based approach
This project's ultimate goal is to implement structural changes in RAC manufacturing and servicing sectors for cleaner production and contribute to the quality of people's lives, through the protection of the ozone layer and reduction in direct and indirect emissions. The technical and the enough financial assistance provided through this project remain one of the key inputs needed to minimize the burden of transition on consumers and local industries. The project also seeks to empower all State agencies and private companies that are linked to the acquisition and use of ODS to promote the use of ODS free and low GWP technologies that do not deplete the ozone layer and reduce emissions. In compliance with the UN Declaration of Human rights, the project has mandate to protect the health and environment through the reduction and phase-out of harmful chemicals able to deplete the Ozone layer and interfere climate change. The project was created to protect human right on promoting healthier environment and human wellbeing.
Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment
While the project does not have a specific gender related dimension, it will implement a wide range of activities for capacity-building relating to the protection of the environment, the elimination of HCFCs and the promotion of the use of alternate cleaner technologies, aimed at the central public institutions and sectors of RAC services. The project team will promote the participation of women in consultation meetings and will address gender inequalities in terms of access to clean production, finance, and decision-making and capacity building of women when applicable. Project have direct impact on training of women technicians on RAC sector. Project activities have an indirect impact on the level of knowledge of women users of home appliances that will be made ozone friendly under the project.
Briefly describe in the space below how the Project mainstreams environmental sustainability
The project mainstreams environmental sustainability through reducing or completely eliminate the dependence/use of chemicals (HCFCs) that deplete the ozone layer from the manufacturing and servicing sectors which are the key activities of the second phase of the HPMP implementation. The project will support implementation of the country's environmental policy and contributes to the global efforts to safeguard the environment and mitigate the climate change while helping restore the stratospheric ozone layer. It also contributes to the national efforts towards attaining the SDGs.

Part B. Identifying and Managing Social and Environmental Risks

QUESTION 2: What are the Potential Social and Environmental Risks? *Note: Describe briefly potential social and environmental risks identified in Attachment 1 – Risk Screening Checklist (based on any "Yes" responses). If no risks have been identified in Attachment 1 then note "No Risks Identified" and skip to Question 4 and Select "Low Risk". Questions 5 and 6 not required for Low Risk Projects.*	**QUESTION 3: What is the level of significance of the potential social and environmental risks?** *Note: Respond to Questions 4 and 5 below before proceeding to Question 6*			**QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?**
Risk Description	***Impact and Probability (1-5)***	***Significance (Low, Moderate, High)***	***Comments***	***Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.***
Risk 1(standard 3.7): Improper handling of flammable alternatives to HCFCs (e.g. hydrocarbons) used in the RAC sector	I = 3 P = 2	**High**		The safety system of the projects will be evaluated by an independent safety auditor. Following ISO Standard will be used to ensure the safety and environmental requirement: (i) BDT ISO 5149-1:2018 Refrigerating systems and heat pumps-safety and environmental requirements-part 1: Definitions, classifications and deletion criteria. (ii) BDT ISO 5149-2:2018 Refrigerating systems and heat pumps-Safety and environmental requirements-Part 2: Design, construction, testing, marking and documentation (iii) BDS ISO 5149-3:2018 Refrigerating systems and heat pumps-Safety and environmental requirements-Part 3: Installation site (iv) BDS ISO 5149-4: 2018 Refrigerating systems and heat pumps-safety and environmental requirements-Part 4: Operating, maintenance, repair and recover
Risk 2 (Standard 3.8): The project can risk the livelihoods of informal sector engaged in waste collection and processing and small energy and construction sectors.	I=3 P=2	**Moderate**	Health hazard of waste pickers at the waste disposal site is often poor. Unhygienic as well as unorganized handling may possess serious and long-term impact on the urban poor population whose income generation depends on waste picking and collection from landfills and dump sites	The Project will check the involvement of informal workers and improved working conditions and occupational health and safety standards of workers and community people where such community-ward based waste management committees operates.

Risk 5 (Principle 2.1): Lack of participation of women in project planning and implementation process	I=3 P=3	**Moderate**	Traditionally there is less representation and participation of women in the technical education system in Bangladesh particularly RAC sector	Women will be engaged during the consultation meetings, prioritized to avail the program and be included in the different capacity building programs. Walton Hi-Tech Industries Ltd., has been guided to involve women in AC production line during conversion of lines from HCFC-22 to R-290.

	QUESTION 4: What is the overall Project risk categorization?		
	Select one (see SESP for guidance)		**Comments**
	Low Risk	☐	.
	Moderate Risk	☐	
	High Risk	☐ X	The overall project risk categorization is high due to flammability of refrigerant. Although the risk can be managed “know as engineering control" by applying safety sensors, devices, etc.
	QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?		
	Check all that apply		**Comments**
	Principle 1: Human Rights	☐	The project is consistent with the relevant human rights conventions that Government of Bangladesh has ratified including relevant sectors of human rights that are provided by the Constitution of Bangladesh.

	Principle 2: Gender Equality and Women's Empowerment	☐	The project gives enough space for knowledge generation and sharing, awareness raising, training and practice of decision-making roles for all including women.
	Principe 3 : Environmental sustainability		The environmental impacts of the project activities can be mitigated through the implementation of an appropriate environmental code of practice and environmental management plan,
	1. Biodiversity Conservation and Natural Resource Management	☐	The project does not pose any adverse impact on any natural habitat, neither to any wildlife species and biodiversity because of the Project interventions will be within the involved company's/factories premises. In addition, the Project is expected to have no impacts on the management, protection, or utilization of natural forests or plantations and biodiversity or any ecosystem.
	2. Climate Change Mitigation and Adaptation	**x**	The expected environmental and social impacts can be mitigated through implementation of an appropriate environmental code of practice and environmental and social management plans. The project activities will contribute to reduce global warming potential and positively contribute to climate change mitigation.
	3. Community Health, Safety and Working Conditions	**x**	Project activities have some risks to worker's occupational health and safety. However, proper occupational health and safety measures and codes will be followed and ISO standardization will be implemented to ensure safety
	4. Cultural Heritage	☐	No negative impact on landscapes with archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance is expected.
	5. Displacement and Resettlement	☐	The project component would not pose risk of displacement and resettlement of any people or communities.
	6. Indigenous Peoples	☐	Therefore, the project activities would not likely pose any adverse impact on indigenous people.
	7. Pollution Prevention and Resource Efficiency	**x**	This project will promote energy and other resource efficiency.

Final Sign Off

Signature	***Date***	***Description***
QA Assessor		Programme Specialist, UNDP
QA Approver		Deputy Resident Representative, UNDP
PAC Chair		Resident Representative, UNDP

SESP Attachment 1. Social and Environmental Risk Screening Checklist

Checklist Potential Social and Environmental Risks		
Principles 1: Human Rights		**Answer (Yes/No)**
1.	Could the Project lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups?	No
2.	Is there a likelihood that the Project would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups? [10]	No
3.	Could the Project potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups?	No
4.	Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them?	No
5.	Is there a risk that duty-bearers do not have the capacity to meet their obligations in the Project?	No
6.	Is there a risk that rights-holders do not have the capacity to claim their rights?	No
7.	Have local communities or individuals, given the opportunity, raised human rights concerns regarding the Project during the stakeholder engagement process?	Yes
8.	Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project-affected communities and individuals?	No
Principle 2: Gender Equality and Women's Empowerment		
1.	Is there a likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls?	No
2.	Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	No
3.	Have women's groups/leaders raised gender equality concerns regarding the Project during the stakeholder engagement process and has this been included in the overall Project proposal and in the risk assessment?	No
4.	Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services? *For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well being*	No
Principle 3: Environmental Sustainability: Screening questions regarding environmental risks are encompassed by the specific Standard-related questions below		
Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management		
1.1	Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services? *For example, through habitat loss, conversion or degradation, fragmentation, hydrological changes*	No
1.2	Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?	No
1.3	Does the Project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5)	No
1.4	Would Project activities pose risks to endangered species?	No

[10] Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to "women and men" or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

1.5	Would the Project pose a risk of introducing invasive alien species?	No
1.6	Does the Project involve harvesting of natural forests, plantation development, or reforestation?	No
1.7	Does the Project involve the production and/or harvesting of fish populations or other aquatic species?	No
1.8	Does the Project involve significant extraction, diversion or containment of surface or ground water? *For example, construction of dams, reservoirs, river basin developments, groundwater extraction*	No
1.9	Does the Project involve utilization of genetic resources? (e.g. collection and/or harvesting, commercial development)	No
1.10	Would the Project generate potential adverse transboundary or global environmental concerns?	No
1.11	Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area? *For example, a new road through forested lands will generate direct environmental and social impacts (e.g. felling of trees, earthworks, potential relocation of inhabitants). The new road may also facilitate encroachment on lands by illegal settlers or generate unplanned commercial development along the route, potentially in sensitive areas. These are indirect, secondary, or induced impacts that need to be considered. Also, if similar developments in the same forested area are planned, then cumulative impacts of multiple activities (even if not part of the same Project) need to be considered.*	No
Standard 2: Climate Change Mitigation and Adaptation		
2.1	Will the proposed Project result in significant[11] greenhouse gas emissions or may exacerbate climate change?	No
2.2	Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change?	No
2.3	Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices)? *For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding*	No
Standard 3: Community Health, Safety and Working Conditions		
3.1	Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities?	No
3.2	Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	No
3.3	Does the Project involve large-scale infrastructure development (e.g. dams, roads, buildings)?	No
3.4	Would failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure)	No
3.5	Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions?	No
3.6	Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)?	No
3.7	Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?	Yes
3.8	Does the Project involve support for employment or livelihoods that may fail to comply with national and international labor standards (i.e. principles and standards of ILO fundamental conventions)?	No
3.9	Does the Project engage security personnel that may pose a potential risk to health and safety of communities and/or individuals (e.g. due to a lack of adequate training or accountability)?	Yes
Standard 4: Cultural Heritage		

[11] In regards to CO_2, 'significant emissions' corresponds generally to more than 25,000 tons per year (from both direct and indirect sources). [The Guidance Note on Climate Change Mitigation and Adaptation provides additional information on GHG emissions.]

4.1	Will the proposed Project result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: Projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	No
4.2	Does the Project propose utilizing tangible and/or intangible forms of cultural heritage for commercial or other purposes?	No
Standard 5: Displacement and Resettlement		
5.1	Would the Project potentially involve temporary or permanent and full or partial physical displacement?	No
5.2	Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	No
5.3	Is there a risk that the Project would lead to forced evictions? (Force evictions include acts and/or omissions involving the coerced or involuntary displacement of individuals, groups, or communities from homes and/or lands and common property resources etc.)	No
5.4	Would the proposed Project possibly affect land tenure arrangements and/or community based property rights/customary rights to land, territories and/or resources?	No
Standard 6: Indigenous Peoples		
6.1	Are indigenous peoples present in the Project area (including Project area of influence)?	No
6.2	Is it likely that the Project or portions of the Project will be located on lands and territories claimed by indigenous peoples?	No
6.3	Would the proposed Project potentially affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples (regardless of whether indigenous peoples possess the legal titles to such areas, whether the Project is located within or outside of the lands and territories inhabited by the affected peoples, or whether the indigenous peoples are recognized as indigenous peoples by the country in question)? *If the answer to the screening question 6.3 is "yes" the potential risk impacts are considered potentially severe and/or critical and the Project would be categorized as either Moderate or High Risk.*	No
6.4	Has there been an absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	No
6.5	Does the proposed Project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	No
6.6	Is there a potential for forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories, and resources?	No
6.7	Would the Project adversely affect the development priorities of indigenous peoples as defined by them?	No
6.8	Would the Project potentially affect the physical and cultural survival of indigenous peoples?	No
6.9	Would the Project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	No
Standard 7: Pollution Prevention and Resource Efficiency		
7.1	Would the Project potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	No
7.2	Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?	Yes
7.3	Will the proposed Project potentially involve the manufacture, trade, release, and/or use of hazardous chemicals and/or materials? Does the Project propose use of chemicals or materials subject to international bans or phase-outs? *For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Conventions on Persistent Organic Pollutants or the Montreal Protocol*	No
7.4	Will the proposed Project involve the application of pesticides that may have a negative effect on the environment or human health?	No
7.5	Does the Project include activities that require significant consumption of raw materials, energy, and/or water?	No

ANNEX V: RISK ANALYSIS

OFFLINE RISK LOG

HCFC Phase-Out Management Plan (HPMP Stage-II) For Compliance with the 2020 and 2025 Control Targets	Award ID: 00112138	Date:

Item	Description	Date Identified	Type	Impact & Probability	Countermeasures / Management Response	Owner	Submitted updated by	Last Update	Status
1.	Time delay in technology development	Project Initiation	Operational	Delay in the conversion of technologies in the industries – Not complying with set targets. P=1 I=4	(a) Close monitoring of technology development by the Project Unit in consultation with technical experts. (b) Regular consultations with industries on conversion to HCFC free technologies highlighting benefits of new technology options (c) Updates on regulations that would prohibit adoption of old HCFCs based technologies in advance (2-3 years).	UNDP	Project Manager		
2.	Difficulties in adaptation of new technologies by Small enterprises (Delay in availability of cost effectiveness and commercially available ODS free and low GWP options etc.)	Project Initiation	Operational	Lack of awareness of industries P= 2 I= 2	(a) Start working on identifying technologies and alternatives at the earliest. (b) Workshops and consultations with industries on HPMP Stage-II and support offered to service sector for HCFC phase-out project activities (including funding support). (c) Updates on regulations that would prohibit adoption of old HCFC based technologies and its impact on servicing applications. (d) Closer engagement and cooperation with large equipment manufacturers on service sector capacity building support.	NOU	UNDP		
3.	Proper control of outmoded HCFCs from service sector	Project Initiation	Operation and Legal	P= 2 I= 3	The risk is localized and could be mitigated by proper containment and recovery of the outmoded material.	NOU	UNDP		

4.	*Implementation delay* followed by reputational risks (Delay in endorsement of action plans by government, Lack of sufficient capacity to carry out the project activities etc.)	Project Initiation	Operational	P= 1 I= 1	a) GOB has successfully phased out the consumption of other Ozone depleting substances (ODS) e.g., Chlorofluorocarbons (CFCs), partially HCFCs and Methyl Chloroform in line with the Montreal Protocol schedule. The lessons learnt from ODS phase out in the past would help in addressing the operational bottlenecks, if any. b) Sound implementation framework, result-oriented and integrated approach will ensure timely and successful implementation.	NOU	UNDP		
5.	Safety of industries with use of flammable technologies (Hydrocarbons {A3) and low GWP (A2L) technologies}	Project Initiation	Operational	P= 1 I= 3	a) Insecurity / risk associated in the RAC manufacturing and servicing sectors will be duly addressed and the pre-defined security measures will be taken appropriately. b) The due diligence by UNDP and occupational safety risks must be assessed proactively by independent safety auditor C) Implementing ISO 14001 and OHSAS 18001 standard will handle the hazard and occupational safety concerns.	NOU	UNDP		
6	Availability of Hydrocarbon based or low GWP technologies which is economically Viable	Project Initiation	Operational	Based on the experience, there was a tricky situation where the technology was available but due to limited number of products and production there was rather difficult for the RAC manufacturers to find certain parts for production	As the technology is getting more and more popular, it is predicted that the required parts of technology will be easier to find during the project implementation.	NOU	UNDP		

				process (Such as Compressor) P=2 I=2					
7	RAC Servicing enterprises are geographically distributed at different parts of the country	Project Initiation	Operational	P=1 I=1	In coordination with relevant stakeholders, UNEP, UNDP and MOEFCC are working together to assure the training of the RAC servicing technicians at different divisions in Bangladesh	NOU	UNDP		
8	Delay in Ratification of Kigali Amendment	Project Initiation	Operational / Political	Involved Government decision P= 2 I= 2	a) Development of technical paper, inter parliament note and legislation and policy framework at the earlier convenience time. b) Ensuring the political commitment and arrangement of co-ordination meeting and creation of awareness among the concerning parties.	NOU, MoEF CC	PO/ UNDP		
9	Political instability and security situation in the country	Project Initiation	Political	Political changes and degradation of security situation can slow down or stop the project activities P= 2 I= 2	Close follow up and monitoring of the situation in the country,	NOU	UNDP		
10	The new technology on natural refrigerants will be poorly or not accepted by the market due to higher investment cost and fear of accident	Project Initiation	Operational	P=2 I=2	The information on new technology will be disseminated and appropriate awareness raising efforts will be applied.	NOU	UNDP		

ANNEX VI: TOR OF PROJECT STEERING COMMITTEE (PSC) AND PROJECT IMPLEMENTATION COMMITTEE (PIC)

A ToR for Project Steering Committee

1. GENERAL

The Project Steering Committee (PSC) will be responsible for making by consensus management decisions for the project when guidance is required by the Programme Coordinator, including recommendations for UNDP/Implementing Partner approval of project plans and revisions.

In order to ensure UNDP's ultimate accountability, Project Steering Committee (PSC) decisions should be made in accordance with standards[12] that shall ensure the best value to money, fairness, integrity transparency and effective international competition. In case a consensus cannot be reached, final decision shall rest with the UNDP Programme Manager. Project reviews by this group are made at designated decision points during the running of a project, or as necessary when raised by the Programme Coordinator. This group is consulted by the Programme Coordinator for decisions when tolerances (normally in terms of time and budget) have been exceeded.

The PSC will review and approve project annual work plans (AWPs) and, as required, quarterly plans. The PSC authorizes any major deviation from these agreed AWPs. It is the authority that signs off the completion of each AWP and authorizes the start of the next AWP. It ensures that required resources are committed and arbitrates on any conflicts within the project, or negotiates a solution to any problems between the project and external bodies. In addition, it approves the appointment and responsibilities of the Programme Coordinator and any delegation of its Project Assurance responsibilities.

2. PROJECT STEERING COMMITTEE TASKS

a) General project guidance and oversight.
b) Formulation and review of the project management strategy and identification of project priorities.
c) Supervision of project implementation.
d) Assessment of the Project Lead Consultant's and/or any Project Steering Committee Member proposals on any amendments to the project activities differing from those specified in the Project Document.
e) Coordination of the project implementation activities with related national and international projects and programs.

[12] UNDP Financial Rules and Regulations: Chapter E, Regulation 16.05: a) The administration by executing entities or, under the harmonized operational modalities, implementing partners, of resources obtained from or through UNDP shall be carried out under their respective financial regulations, rules, practices and procedures only to the extent that they do not contravene the principles of the Financial Regulations and Rules of UNDP. b) Where the financial governance of an executing entity or, under the harmonized operational modalities, implementing partner, does not provide the required guidance to ensure best value for money, fairness, integrity, transparency, and effective international competition, that of UNDP shall apply.

f) Review, discussion and approval of Project Budgets and Annual Work Plans as well as Project Lead Consultant's implementation reports.
g) Support to the Project Management Unit in seeking support and co-funding for project implementation.
h) Support to the dissemination of information on the project goals, activities, outcomes and lessons learned.
i) Support to the organizations of events by the institutions and organizations represented in the Project Steering Committee, related to project's activities.
j) Regular review of the performance of the Project Lead Consultant and the Project Management Unit.
k) Assistance support to cooperation between the project and national and local authorities, private institutions and NGOs.

3. PSC MEMBERS AND STRUCTURE

a) The members of the PSC are identified in the Project Document and are submitted to the representative of UNDP in the PSC for information.
b) The members of the PSC may be changed by decision of the PSC in accordance with its regular procedures, as described in Section 5 below.
c) All PSC members and observers are entitled to receive full information on the project, and to take part in the PSC discussions. They are also entitled to ask for experts' advice on particular project activities.
d) The representative of UNDP acts as PSC chairperson.
e) The Project Lead Consultant participates as an observer at PSC meetings and acts as its secretary. In case of absence of the Project Main Consultant, his functions can be performed by another member of the PMU or by one member of the PSC designed by those present at the meeting.
f) PSC members can delegate their attendance to PSC meetings to any other person, provided this is notified to the Project Lead Consultant in writing and at least 1 week prior to the session.

4. ORGANIZATION OF PSC ACTIVITIES

a) PSC activities are coordinated by its Chairperson, or another PSC member appointed by the Chairperson.
b) PSC sessions are held at least every six months. Additional PSC sessions can be conveyed but the Chairperson or at the written request of at least one of the PSC members.
c) The PSC meeting agenda and its related documents must be distributed at least 1 week in advance.
d) PSC decisions are taken by consensus.

e) The PSC Secretary (Project Lead Consultant) is responsible for drafting of agenda, organizing the session, sending information to PSC members and observers, preparation and distribution of the documents for discussion, and preparation of draft minutes.
f) Minutes should be prepared after every PSC session, signed by PSC Secretary and pre-approved by the PSC Chairperson. A copy of the pre-approved minutes of the meeting should be sent to PSC members within 2 weeks after the meeting. Minutes should be approved by the PSC at its subsequent meeting.
g) The PSC Chairperson is entitled to instruct the PSC Secretary to organize an extraordinary virtual PSC session on urgent issues that need immediate approval. The PSC secretary will send the necessary documents for examination and discussion to all PSC members and observers. In this case, PSC members should and observers could send their opinion and position on the issues submitted to approval through a letter or e-mail message to the PSC secretary. The absence of such reply is considered as consent with the proposals. Within one week, the PSC secretary should summarize the replies received and submit the final decision to the PSC Chairperson for final approval.
h) PSC members are not entitled to receive extra remuneration or material benefits from any activities financed under the project (excluding DSA and transportation when representing the project outside Montevideo, as appropriate).

5. TERMINATION OF PSC MEMBERSHIP

A question on termination of membership of any PSC member should be raised by the PSC Chairperson to the plenary in the following cases:

a. If the member could no longer perform his/her duties, as set forth in the present ToR;

b. If the member has been absent in more than two consecutive PSC sessions;

c. If the member has concluded his/ her relationship with the organization he/she represented at the PSC.

B ToR for Project Implementation Committee (PIC)

The PIC will provide administrative and technical advice and inputs relating to project implementation with support from the Project Manager (PM). The members of the PIC will consist of representatives from the PMU various ministerial departments, institutions, private sector and NGO representatives, etc.to be agreed by the PSC. Technical experts may be invited in to discuss specific issues. Indicative Terms of Reference are as follows. These will be reviewed by the PSC during project inception and may be extended as necessary.

- Review planned activities and ensure that they are technically sound and that, wherever possible, there is integration and synergy between the various project components during planning and implementation; and with low-carbon development initiatives at national and city level;

- Promote technical horizontal and vertical coordination, where such coordination is necessary and where opportunities for synergy and sharing of lessons exist;
- Provide technical advice to partner;
- Provide advice and guidance on the Project's capacity building needs and training, and the implementation of stakeholder outreach (consumer awareness, knowledge, and information);
- Share information on project progress and lessons learned with related stakeholders at the national level;
- Other tasks as directed by the PSC

Annex VII ToR of PMU staff

I. Position Information	
Job Code Title:	Project Manager
Position Number:	1
Duty station:	Department of Environment (DoE)
Reports to:	Programme Specialist, UNDP and NPD, DoE/MoEFCC
Position Status:	Rotational, based on performance
Current Grade:	**SB4 Band**
Source of funding:	Montreal Protocol Multilateral Fund

II. Organizational Context

The 81st Meeting of the Executive Committee (ExCom) of the Multilateral Fund (MLF) for the implementation of the Montreal Protocol (UNEP/OzL.Pro/ExCom/81/58; 22 June 2018) decision 81/39 approved the Hydrochlorofluorocarbon (HCFC) phase-out management plan (HPMP) Stage–II for Bangladesh for the implementation of Montreal Protocol (MP). For the implementation of HPMP Stage-II, United Nations Develop Programme (UNDP) has been designated the lead implementing agency and United Nations Environment Programme (UN Environment) is the cooperating agency, with separate fund allocation for each agency along with the Government of Bangladesh (GoB).

The GoB has agreed to follow the Montreal Protocol schedule and is committed to reduce HCFCs consumption by 67.5% of the baseline by 2025. The implementation of Stage-II of the HPMP will help to phase out of 17.09 ozone depletion potential (ODP) tonnes of HCFC-22 used in the domestic and commercial air-conditioners manufacturing sector through UNDP's investment component. The phase-out of 17.09 ODP tonnes of HCFC-22 is equivalent to a net CO_2 emission reduction of 1,730,798 CO_2-eq tons.

This will assist Bangladesh in meeting the Montreal Protocol compliance target. Besides these, through conversion to R-290 and R-32 (refrigerants), energy savings would be achieved which, in turn, will ensure national energy efficiency improvements and indirect GHG emissions reduction. During the implementation of the HPMP Stage-II, health and safety and energy efficiency issues are taken into consideration in line with national and international regulations, standards and guidelines.

The project will be implemented during 2019-2025. Total funding approved, in principle, was US$ 5,890,694 excluding support costs with a UNDP share being US$ 5,356,014. The first tranche of US$ 2,142,405 was approved through a multi-year performance-based agreement between the Government of Bangladesh and the Executive Committee. Subject to meeting the conditions for

funding release as stipulated in paragraph 5 of the Agreement, the second and third tranches of US$ 2,142,405 and US$ 1,071,204 will be released to UNDP in 2020 and 2022 respectively.

In summary, the successful implementation of HPMP stage II will accelerate the GoB in phasing out the agreed HCFCs within the set target time, improving the energy efficiency in refrigeration and air conditioning (RAC) sector, reducing direct and indirect CO_2 emission.

III. Responsibilities

The incumbent will be responsible for (a) overall management, ensure a high level of technical quality of deliverables and overall supervision of the project, (b) work closely with relevant project stakeholders and ensure the project deliveries as per project document and work plan (c) ensure technical coordination of the project and the work related to legal and institutional aspects, (d) mobilize all project inputs in accordance with best practices on technical content and UNDP/GoB procedures and MLF principles, (e) finalize the ToR for all the consultants and subcontractors and coordinate with UNDP Procurement for recruitment, procurement and contracting,(f) support in procurement of all goods and services of the project, (g) supervise and coordinate the work of all PMU staff, consultants, industries and sub-contractors, (h) ensure proper management of funds consistent with UNDP & MLF requirements, and budget planning and control, (i) prepare and ensure timely submission of all progress and financial reports, bi-annual, mid-term and terminal reports, and other reports as may be required by UNDP and MLF, (j) organize PSC meeting and submit the progress reports (j) prepare quarterly and annual work plan, (k) provide regular input to UNDP corporate system ATLAS for financial and program management on project progress, financial status and various risk and issue logs, (l) arrange for audit of all project accounts for each fiscal year (m) undertake field visit to ensure quality of work, and (n) undertake any activities that may be assigned by UNDP and Project Steering Committee.

a) Facilitate the day-to-day functioning of the Project Management Unit (PMU)
b) Manage human and financial resources, in consultation with the UNDP, NPD and project's senior management, to achieve results in line with the outputs and activities outlined in the project document
c) Lead the preparation and implementation of the annual results-based work plans and budget and logical frameworks as endorsed by the management
d) Coordinate project activities with related and parallel activities of DoE/MoEFCC and with industries
e) Manage and monitor the project risks initially identified and submit new risks to the PSC for consideration and decision on possible actions if required and update the status of these risks by maintaining the project risks log according to the NIM Guidelines.
f) Monitor project activities, including financial matters, and prepare monthly and quarterly progress reports, and organize monthly and quarterly progress reviews
g) Support/organize PSC meetings
h) Coordinate the distribution of responsibilities amongst team members and organize the monitoring and tracking system of all cluster services
i) Report and provide feedback to UNDP, NPD and the PSC on project strategies, activities, progress, and barriers

j) Manage relationships with project stakeholders including donors, private sectors, research institutions and academia, government agencies, media and others as required

IV. Functions / Key Results Expected

a) Overall operational management for successful implementation;
b) Supervision and coordination of different teams to ensure delivery of project outputs;
c) Knowledge building and capacity enhancement services;
d) Financial Management, procurement and disbursement;
e) Provide policy support to the project;
f) Partnership and Resources

V. Impact of Results

In particular, the key results have an impact on the overall success of the country programme and reaching Country Programme Document, UNDAF, CPD and 7th Five-year plan goals. In particular, the key results have an impact on the design, operation and programming of activities, creation of strategic partnerships as well as reaching overall project targets.

VI. Competencies

Corporate Competencies:

a) Demonstrates integrity by modelling the UN's values and ethical standards
b) Should also abide by the rules and regulations of the government as applicable for project personnel
c) Promotes the vision, mission, and strategic goals of UNDP
d) Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability
e) Treats all people fairly without favouritism

Functional Competencies:

Knowledge Management and Learning

a) Promotes a knowledge sharing and learning culture in the office
b) In-depth knowledge on development issues
c) Ability to advocate and provide policy advice on the relevant sector/theme
d) Excellent knowledge of capacity building theory and the application of methodology: good understanding of capacity assessment methodologies; excellent ability to identify significant capacity building opportunities, ability to get capacity built, excellent ability to demonstrate national capacities built (mastery of the tools and their application)
e) Actively works towards continuing personal learning and development in one or more Practice Areas, acts on learning plan and applies newly acquired skills
f) Excellent communication skills (written and oral): Sensitivity to and responsiveness to all partners, Respectful and helpful relations with all UN/UNDP staff,

Development and Operational Effectiveness:

a) Ability to lead strategic planning, results-based management and reporting. Ability to lead strategic planning, results-based management and reporting: full project cycle mastery, excellent work/project planning skills, familiarity of UNDP's new programme modalities (PRINCE 2, RBM Guide, DIM execution etc.)
b) Ability to lead formulation, implementation, monitoring and evaluation of development programmes and projects, mobilize resources
c) Ability to formulate and manage budgets, manage contributions and investments
d) Strong IT skills
e) Ability to lead implementation of new systems (business side), and affect staff behavioural/ attitudinal change

Management and Leadership:

a) Focuses on impact and result for the client and responds positively to feedback
b) Leads projects teams effectively and shows conflict resolution skills
c) Consistently approaches work with energy and a positive, constructive attitude
d) Demonstrates strong oral and written communication skills
e) Builds strong relationships with clients and external actors
f) Remains calm, in control and good humoured even under pressure
g) Demonstrates openness to change and ability to manage complexities

VII Recruitment Qualifications

Education: Minimum Masters in the disciplines of Mechanical/ Electrical/ Chemical Engineering /Environmental Sciences, Environmental Engineering, or closely relevant disciplines.

Experience and Qualification:

a) Proven track record of project management and project team experience working with government, private sectors, Industry, and other key stakeholders.
b) Demonstrated track record in the management, monitoring and reporting of similar project, preferably working with government, private sectors, NGOs, and other key stakeholders
c) At least 10 years working experience within the disciplines of environmental science/management, industry, climate change, etc.,
d) Experience guiding and supervising multi-disciplinary project teams
e) Maturity and confidence in dealing with senior members of national institutions.
f) Sound knowledge on Energy efficiency, SCP, Montreal protocol, Kigali Amendment, etc
g) Should have a high degree of familiarity with the UNFCCC and its implementation in national and at global level.
h) Extensive business and information exchange contacts with national and international agencies involved in local and international studies relevant to the HPMP
i) Good knowledge of the legislative and policy aspects of the mitigation framework of Bangladesh
j) Strong interpersonal skills, communication and strategic negotiation skills, ability to work in a team.

k) Excellent English drafting, presentation and facilitation skills

Language Requirements: Fluency in the English and Bangla languages.

2. Finance Associate

I. Position Information

Job Code Title: Finance Associate

Position Number:	1
Duty station:	Department of Environment
Reports to:	Project Manager
Current Grade:	SB3
Source of funding:	UNDP and MLF

II. **Background**

The 81st Meeting of the Executive Committee (ExCom) of the Multilateral Fund (MLF) for the implementation of the Montreal Protocol (UNEP/OzL.Pro/ExCom/81/58; 22 June 2018) decision 81/39 approved the Hydrochlorofluorocarbon (HCFC) phase-out management plan (HPMP) Stage–II for Bangladesh for the implementation of Montreal Protocol (MP). For the implementation of HPMP Stage-II, United Nations Develop Programme (UNDP) has been designated the lead implementing agency and United Nations Environment Programme (UN Environment) is the cooperating agency, with separate fund allocation for each agency along with the Government of Bangladesh (GoB).

The GoB has agreed to follow the Montreal Protocol schedule and is committed to reduce HCFCs consumption by 67.5% of the baseline by 2025. The implementation of Stage-II of the HPMP will help to phase out of 17.09 ozone depletion potential (ODP) tonnes of HCFC-22 used in the domestic and commercial air-conditioners manufacturing sector through UNDP's investment component. The phase-out of 17.09 ODP tonnes of HCFC-22 is equivalent to a net CO_2 emission reduction of 1,730,798 CO_2-eq tons.

This will assist Bangladesh in meeting the Montreal Protocol compliance target. Besides these, through conversion to R-290 and R-32 (refrigerant), energy savings would be achieved which, in turn, will ensure national energy efficiency improvements and indirect GHG emissions reduction. During the implementation of the HPMP Stage-II, health and safety and energy efficiency issues are taken into consideration in line with national and international regulations, standards and guidelines.

III. Functions

Summary of Key Functions:

Key functions of FA are:

1. Support in overall financial and administrative matters
2. Support to project planning and management
3. Support for implementation of project

4. Support to project management 5. Logistic and ICT support to the Project
1. Support in overall administrative and financial matters a) FA shall assist the PM in the overall administrative and financial matters of the project. b) FA shall be responsible for all administrative (contractual, organizational and logistical) and accounting (disbursements, record-keeping, cash management) matters under the project; c) FA will be responsible for preparing periodic financial statements and compiling the annual project activities and achievement of planned project outputs; d) FA shall provide general administrative and financial support to the project so as to ensure the smooth running of the project management unit; provide logistical support to the project staff and consultants in conducting different project activities; e) FA shall monitor the budget expenditures by preparing payment documents, and compiling financial reports; maintain the project's disbursement ledger and journal; keep files with project documents, expert reports; control the usage of non-expendable equipment (record keeping, drawing up regular inventories); f) FA shall draft and finalize correspondence of administrative nature; arrange duty travel; fax, post and e-mail transmissions, and co-ordinate appointments; g) FA shall also perform any other administrative/financial duties as requested by the UNDP/PM and organize and coordinate the procurement of services and goods under the project.
2. a) Ensure support for implementation of Project focusing on achievement of the following results: b) Assist to prepare budget revisions of the projects based on the PDRs and CDRs; assist in the preparation of the AWP c) Ensure uploading of Atlas Project Budget and Multiyear budget d) Provide Atlas Budgetary inputs in line with project approved AWPs and ready for KK'ed of Atlas Project Budget e) Prepare quarterly Fund Authorization and Certification of Expenditures (FACE) and ensure timely submission to UNDP f) Assist the Project Team for preparation of monthly, quarterly, annual progress reports, Project Implementation Report (PIR) to UNDP and MLF g) Act as a Project focal Point and support to prepare monthly Project Reporting to Government, IMED, ADP etc. report for the project and ensure timely submission to the Government h) Assist Project Management in settlements of DSA and other claims of staff and other service providers as per UNDP rules; i) Assist the Project Manager and Project Officer for all kinds of financial and project management related activities including liaison with different government agencies/UNDP CO/donor partners, NGOs and other key stakeholders, as directed; j) Prepare periodic accounting records by recording receipts and disbursements and reconciling data for recurring or financial special reports and assist in preparation of annual procurement plan
3. Ensure support for implementation of Project focusing on achievement of the following results: a) Assist the PM for in quality and on time procurement of goods and services including Micro-purchasing b) Assist PM for procurement of office stationeries and expendables under the project

c) Draft necessary correspondence both in English and Bengali with local agencies and stakeholders as applicable
d) Maintain close linkages with relevant agencies and stakeholders

4. Ensure support to project management focusing on achievement of the following results:

a) Maintain all files and records of the project in both electronic and hard copies
b) Prepare monthly leave records for the project staff and international consultants
c) Support to the PM by drafting ToRs of Project Consultants
d) Manage Project Non-Expendable and Expendable Items inventory and update on regular interval
e) Obtain Annual Physical verification on the Project Non-Expendable Inventory

5. Ensure Logistic and ICT support to the Project focusing on achievement of the following results:

a) Provide logistical support to the National Project Director, Project Manager, and international consultants in organizing training events, workshops, and seminars
b) Assist international, short-term consultants by organizing their travel schedules, arranging meetings with different stakeholders, and book hotel accommodations
c) Coordinate and arrange monitoring travel of Gob officials under the project
d) Assist the PM, MIS Expert, and relevant project professionals on technical information management strategies, data architecture, cross-functional design, and maintenance issues
e) Assist in creating and maintaining the project-related database and intranet ensuring that the content is updated and meets the requirements of project
f) Assist in data entry and provide technical support to the Project Manager, experts, and others using the database to input or maintain documentation
g) Assist in managing cross-functional databases, create new cross-functional database systems, and enhance existing cross-functional database systems for improved efficiency and service
h) Maintain and administer the project database and support automation
i) Support to Project ICT Trouble shootings
j) Provide substantive support to the PM for overall implementation. Any other functions, responsibilities or portfolio which may be assigned by the PM or UNDP management.

IV. Impact of Results

The key results have an impact on the overall success of the project tasks and goals. In particular, the key results have an impact on the design, operation and programming of activities, creation of strategic partnerships and reaching overall project and programme targets.

- **V. Competencies**

Corporate Competencies:

a) Demonstrates commitment to UNDP's mission, vision and values.
b) Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability.
c) Functional Competencies:
d) Knowledge Management and Learning-
e) Shares knowledge and experience.
f) Encourages office staff to share knowledge and contribute to UNDP Practice Areas.
g) Actively works towards continuing personal learning and development in one or more Practice Areas, acts on learning plan and applies newly acquired skills.
h) Development and Operational Effectiveness:
i) Ability to perform a variety of specialized activities related to financial resources management, including formulating budgets, maintaining Accounts Receivables and Accounts Payables, making transactions, reporting.
j) Sound knowledge of financial rules and regulations.
k) Strong IT skills.
l) Ability to provide input to business processes re-engineering, implementation of new financial systems.
m) Ability to carry out qualitative and quantitative analyses.

Management and Leadership:

a) Builds strong relationships with clients, focuses on impact and result for the client and responds positively to feedback.
b) Consistently approaches work with energy and a positive, constructive attitude.
c) Demonstrates good oral and written communication skills.
d) Demonstrates openness to change and ability to manage complexities.
e) Demonstrates integrity by modelling the UN's values and ethical standards.
f) Promotes the vision, mission, and strategic goals of UNDP.
g) Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability.

❑ VI. Recruitment Qualifications

Education:	Masters in Accounting, Finance, Management or Business Administration
Experience:	▪ At least 5 years practical experience in administration and finance ▪ Strong understanding of budgeting and UN/GoB accounting system. Candidates familiar with UNDP administrative, program, and financial procedures preferred ▪ Ability to use MS Office packages under the Windows XP Professional environment ▪ Initiative, sound judgment, and capacity to work independently ▪ Proficient verbal and written English and Bangla skills ▪ Outstanding time-management, organizational and inter-personal skills;
Language Requirements:	Fluency in English and Bangla both written and spoken.

3. **Project Administrative Assistant**

I. Position Information	
Job Code Title:	Project Administrative Assistant
Position Number:	1
Duty station:	Department of Environment
Reports to:	Project Manager
Current Grade:	SB2
Source of funding:	UNDP and MLF

❑ II. Background

The 81st Meeting of the Executive Committee (ExCom) of the Multilateral Fund (MLF) for the implementation of the Montreal Protocol (UNEP/OzL.Pro/ExCom/81/58; 22 June 2018) decision 81/39 approved the Hydrochlorofluorocarbon (HCFC) phase-out management plan (HPMP) Stage–II for Bangladesh for the implementation of Montreal Protocol (MP). For the implementation of HPMP Stage-II, United Nations Develop Programme (UNDP) has been designated the lead implementing agency and United Nations Environment Programme (UN Environment) is the cooperating agency, with separate fund allocation for each agency along with the Government of Bangladesh (GoB).

The GoB has agreed to follow the Montreal Protocol schedule and is committed to reduce HCFCs consumption by 67.5% of the baseline by 2025. The implementation of Stage-II of the HPMP will help to phase out of 17.09 ozone depletion potential (ODP) tonnes of HCFC-22 used in the domestic and commercial air-conditioners manufacturing sector through UNDP's investment component. The phase-out of 17.09 ODP tonnes of HCFC-22 is equivalent to a net CO_2 emission reduction of 1,730,798 CO_2-eq tons.

This will assist Bangladesh in meeting the Montreal Protocol compliance target. Besides these, through conversion to R-290 and R-32 (refrigerant), energy savings would be achieved which, in turn, will ensure national energy efficiency improvements and indirect GHG emissions reduction. During the implementation of the HPMP Stage-II, health and safety and energy efficiency issues are taken into consideration in line with national and international regulations, standards and guidelines

III. Functions

Summary of Key Functions:

Key functions of Project Assistant are:

1. Support to Project Planning and Management
2. Support for implementation of project
3. Support to project management
4. Logistic, Administration and ICT support to the Project

1. Ensure support for implementation of Project focusing on achievement of the following results:

- Assist to prepare budget revisions of the projects based on the PDRs and CDRs; assist in the preparation of the AWP
- Ensure uploading of Atlas Project Budget and Multiyear budget
- Provide Atlas Budgetary inputs in line with project approved AWPs and ready for KK'ed of Atlas Project Budget
- Prepare quarterly Fund Authorization and Certification of Expenditures (FACE) and ensure timely submission to UNDP
- Assist the Project Team for preparation of monthly, quarterly, and bi-annual progress reports, including bi-annual project report to GCF
- Act as a Project focal Point and support to prepare monthly Project Reporting to Government, IMED, ADP etc. report for the project and ensure timely submission to the Government
- Assist Project Management in settlements of DSA and other claims of staff and other service providers as per UNDP rules;
- Assist the Project Manager and Project Officer for all kinds of financial and project management related activities including liaison with different government agencies/UNDP CO/donor partners, NGOs and other key stakeholders, as directed;
- Prepare periodic accounting records by recording receipts and disbursements and reconciling data for recurring or financial special reports and assist in preparation of annual procurement plan

6. Ensure support for implementation of Project focusing on achievement of the following results:

- Assist the Project Manager for in quality and on time procurement of goods and services including Micro-purchasing
- Assist Project Manager for procurement of office stationeries and expendables under the project
- Draft necessary correspondence both in English and Bengali with local agencies and stakeholders as applicable
- Maintain close linkages with relevant agencies and stakeholders

7. Ensure support to project management focusing on achievement of the following results**:**

- Maintain all files and records of the project in both electronic and hard copies
- Prepare monthly leave records for the project staff and international consultants
- Support to the Project Manager by drafting ToRs of Project Consultants
- Manage Project Non-Expendable and Expendable Items inventory and update on regular interval
- Obtain Annual Physical verification on the Project Non-Expendable Inventory

8. Ensure **Logistic and ICT support to the Project** focusing on achievement of the following results:

k) Provide logistical support to the National Project Director, Project Manager, and international consultants in organizing training events, workshops, and seminars

l) Assist international, short-term consultants by organizing their travel schedules, arranging meetings with different stakeholders, and book hotel accommodations

m) Coordinate and arrange monitoring travel of Gob officials under the project

n) Assist the PM, MIS Expert, and relevant project professionals on technical information management strategies, data architecture, cross-functional design, and maintenance issues

o) Assist in creating and maintaining the project-related database and intranet ensuring that the content is updated and meets the requirements of project

p) Assist in data entry and provide technical support to the Project Manager, experts, and others using the database to input or maintain documentation

q) Assist in managing cross-functional databases, create new cross-functional database systems, and enhance existing cross-functional database systems for improved efficiency and service

r) Maintain and administer the project database and support automation

s) Support to Project ICT Trouble shootings

Provide substantive support to the Project Manager for overall implementation. Any other functions, responsibilities or portfolio which may be assigned by the Project Manager or UNDP management.

IV. Impact of Results

The key results have an impact on the overall success of the project tasks and goals. In particular, the key results have an impact on the design, operation and programming of activities, creation of strategic partnerships and reaching overall project and programme targets.

- **V. Competencies**

Corporate Competencies:

- Demonstrates commitment to UNDP's mission, vision and values.
- Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability.

Functional Competencies:

Knowledge Management and Learning-

- Shares knowledge and experience.
- Encourages office staff to share knowledge and contribute to UNDP Practice Areas.
- Actively works towards continuing personal learning and development in one or more Practice Areas, acts on learning plan and applies newly acquired skills.

Development and Operational Effectiveness:

- Ability to perform a variety of specialized activities related to financial resources management, including formulating budgets, maintaining Accounts Receivables and Accounts Payables, making transactions, reporting.
- Sound knowledge of financial rules and regulations.
- Strong IT skills.
- Ability to provide input to business processes re-engineering, implementation of new financial systems.
- Ability to carry out qualitative and quantitative analyses.

Management and Leadership:

- Builds strong relationships with clients, focuses on impact and result for the client and responds positively to feedback.
- Consistently approaches work with energy and a positive, constructive attitude.
- Demonstrates good oral and written communication skills.

❑ Demonstrates openness to change and ability to manage complexities. ❑ Demonstrates integrity by modeling the UN's values and ethical standards. ❑ Promotes the vision, mission, and strategic goals of UNDP. ❑ Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability.	
VI. Recruitment Qualifications	
Education:	Minimum Bachelor's Degree in Business administration, Economics, or Public Administration/ Social Sciences/ Computer Science/ Information and communications/ Statistics, or related relevant subject. Candidate having 'A-level' with good knowledge on office administration can also apply.
Experience:	▪ 5 years of relevant administrative or program or logistics or IT experiences at the national or international level ▪ Experience in using computers and office software packages, particularly word processing and spreadsheets (MS Word, Excel, etc.) ▪ Knowledge of database packages and web-based management systems ▪ certificate in in secretarial or computer training will be added an advantage ▪ Good typing skills and formatting of documents, reports, etc. ▪ experience in database management, web design, web management and upgrades, IT project management, and the use of different types of hardware/software
Language Requirements:	Fluency in English and Bangla both written and spoken.

Annex VIII: Gender Action Plan

UNDP gender marker for this project is Gen1.

The HPMP Satge II Project considers 'gender' not as women only but as both women and men who can make the best out of the impacts of the project. Hence, the Project will mainstream gender in the following ways-

At the project activity level-

- Collection, inclusion, and use of gender-disaggregated data in the various activities, and gender-relevant information technical reports, documents and awareness-raising materials of the Project;
- Encourage more increased and active participation of women at the planning, designing, and decision-making levels;
- Develop training and awareness raising materials integrated with gender concerns in energy efficiency issues including gender sensitivity (i.e. avoiding gender stereotypes, using inclusive language and using appropriate illustrations.
- Encourage more increased and active participation of women at the citizen awareness and participation

At the partner and stakeholder level, the project will follow the following strategies for gender mainstreaming-

- Sensitization of project stakeholders with regards to gender equality. Efforts will be made to promote a balance between male and female participation;
- In training and awareness activities, 30-40% female participation will be ensured although in this sector participation of women are every limited.
- In all the working teams of the Project governance structure, e.g. PSC; Project Management Unit, Working Groups - gender balance will be ensured by balancing representation of both male and female participants.

Gender and stakeholder engagement:

At the preparatory phase of the project, a stakeholder mapping exercise was undertaken and accordingly stakeholders were identified both female and male stakeholders of varying ages and from all walks of life were invited to give input on the project. During the project, every effort will be made to ensure that qualified women are invited and encouraged to participate in the project activities, to make sure that the proportional representation of both male and females is attained.

Annex IX: Brief Scope of Work for International and National Consultants

Outline of the terms of reference for the international and national consultants are provided below:

Sl No.	Position and Duration of Contract	Responsibilities, Assignments and Deliverables	Qualification
International consultants			
1	Position: Design Expert Duration of Contract: 90 Working days over a period of 3 years	• Give technical assistance in the design, implementation and evaluation of projects in the 5 Air Conditioning and 1 chiller manufacturing industry in Bangladesh aimed at achieving national commitments with the Montreal Protocol. • Review detail existing plant layout plan and the process flow diagram of these 6 industries • Process a new layout plan for them if required. • Undertake site inspections and review implementation requirements in different parts of the manufacturing facilities. This shall include, but not be limited to, equipment infrastructure, civil works, electrical works, training of plant personnel etc. • Select proper machinery and equipment with detail technical specification and guide appropriate guidelines for installation of machineries. • Provide technical specifications of the required tools and instruments need for conversion technology • Perform verification and supervise commissioning of equipment deployed • Update PMU and UNDP about the technical support provided to 6 companies; • Submit monthly progress report to UNDP and PMU. • Present Technical Workshops, Seminars and Training programs under HPMP II project.	• B.Sc Engineering degree in electronics/ mechanicals/ industrial process/ or related field • Advanced degree in relevant discipline is desirable • 10 years working experience with design development, implementation and monitoring of RAC projects. • Experience with management activities in the related area is desirable. • Knowledge of Montreal Protocol and/or environmental policy is desirable
2	Position: Safety Expert Duration of Contract: 100 working days over a period of 3 years	• Classify all identified hazard areas following IEC 60079-10-1:2015 • Review detail plant layout and the process flow diagram to ensure the proper safety inside the plant design. • Desk review of the various changes/ modifications undertaken in the plant for	• B.Sc Engineering in Chemical/ Mechanical or relevant field • Advanced degree in relevant discipline is desirable • Minimum 10 years' experience in reputed company dealing with

Sl No.	Position and Duration of Contract	Responsibilities, Assignments and Deliverables	Qualification
		conversion to Hydrocarbon refrigerant under the project; • Review of regulations, industry standards etc. as applicable for safe transport, storage and use of HCs including national regulations; • Check and report the existing fire safety system of the production floor as per Bangladesh National Building Code. • Undertake site inspections and review of implementation of safety requirements in different parts of the manufacturing facilities. This shall include, but not be limited to, equipment infrastructure, civil works, electrical works, training of plant personnel etc. • Review the training manuals of safe handling and operation of the flammable refrigerant during the production and servicing operation. • Identification of gaps that need to be addressed and corrective actions to be undertaken by the enterprise during safety audit/inspection; • Provide a safety audit report confirming of 6 manufacturing units with safety requirements according to the zone classified for their operations using HCs. • The consultant has to work closely with the National Safety expert • The Consultant has to present reports in the Technical Working Group/PSC/PIC Meeting and incorporate all comments and suggestions in the final report	hazardous/ explosives/ flammable chemicals with occupational safety related responsibilities or experience in fire protection and safety organization/ agency; • Proven experience in conducting safety audits at similar types of manufacturing industry. • Knowledge hydrocarbon-based technology conversion in air-conditioning sectors will be added an extra advantage.
National Consultants			
3	Position: Safety Expert Duration of Contract: 60 working days	• Classify all identified hazard areas following IEC 60079-10-1:2015 • Review detail plant layout and the process flow diagram to ensure the proper safety inside the plant design. • Desk review of the various changes/ modifications undertaken in the plant for conversion to Hydrocarbon refrigerant under the project; • Review of regulations, industry standards etc. as applicable for safe transport, storage and use of HCs including national regulations;	• B.Sc Engineering in Chemical/ Mechanical Engineering or relevant field • Advanced degree in relevant discipline is desirable • Minimum 10 years' experience in reputed company dealing with hazardous/ explosives/ flammable chemicals with occupational

Sl No.	Position and Duration of Contract	Responsibilities, Assignments and Deliverables	Qualification
		• Check and report the existing fire safety system of the production floor as per Bangladesh National Building Code. • Undertake site inspections and review of implementation of safety requirements in different parts of the manufacturing facilities. This shall include, but not be limited to, equipment infrastructure, civil works, electrical works, training of plant personnel etc. • Review the training manuals of safe handling and operation of the flammable refrigerant during the production and servicing operation. • Identification of gaps that need to be addressed and corrective actions to be undertaken by the enterprise during safety audit/inspection; • Provide a safety audit report confirming of 6 manufacturing units with safety requirements according to the zone classified for their operations using HCs. • The consultant has to work closely with the international Safety expert • The Consultant must present reports in the Technical Working Group/PSC/PIC Meeting and incorporate all comments and suggestions in the final report	safety related responsibilities or experience in fire protection and safety organization/ agency; • Proven experience in conducting safety audits at similar types of manufacturing industry. • Knowledge hydrocarbon-based technology conversion in air-conditioning sectors will be added an extra advantage.

Annex X: Full report of **"**HCFC Phase out Management Plan (HPMP Stage II) for compliance with the 2020 and 2025 control targets for Annex-C, Group I substances", prepared and submitted by DoE to ExCom on 21 March 2018