HCFC's Phase-out Management Plan
HPMP – Stage II

Annual Report

Multilateral Fund for the Implementation of the Montreal Protocol





Implementing Agency:	United Nations Development Programme
Country/Region or Area:	Egypt
Project Title and ID:	00106347
	107118 - 122723 - 132893
Project Duration:	2019 - 2026
Project Budget for (year) (AWP):	74,000 $
Overall Project Budget:	3,695,722 $
Reporting Period:	2025
Contact Person/s:	Bassem Gamil , Project Manager (+2 012 2755 1516 – bassem.gamil@hotmail.com) United Nations Development Programme

Multilateral Fund
for the Implementation of the Montreal Protocol

Table of Contents

I. Introduction 4
II. Progress Review 5
III. Monitoring and Evaluation 10
IV. Key Challenges, Lessons Learned and Recommendations 11
V. Update on risks and mitigation measures 12
VI. Partnerships and Sustainability 12
VII. Financial Summary 13

Annex IV: Annual Work Plan 14
Annex IV: Assets inventory 15
Annex III: Markers 16

Acronyms

(Note: it should be arranged in alphabetical order)

AWP	Annual Work Plan
EEAA	Egyptian Environmental Affairs Agency
GoE	Government of Egypt
HCFC's	Hydrocloroflurocarbons
HFC's	Hydroflurocarbons
HFO	Hydrofluoroolefin
HPMP	HCFC's phase-out management plan
IOC	Incremental Operating Cost
MoA	Memorandum of agreement
MoE	Ministry of Environment
MLFS	Multilateral Fund secretariat
MP	Montreal Protocol
NOU	National Ozone Unit
ODS	Ozone Depleting substances
PMU	Project Management Unit
PU	Polyurethane foam
SME	Small and Medium Enterprise
SHs	System Houses
UNDP	United Nations Development Programme
VSU	Very Small User
XPS	Xtruded polystereen foam

I. Introduction

- This project is part of the phase-II HCFC Phase-out Management Program (HPMP-II) that addresses the fulfillment of Egypt's Montreal Protocol obligations for the period 2017-2025.

- The objective of this project is to phase-out the use of HCFC-141b, HCFC-142b and HCFC-22 in eligible PU foam and XPS foam applications in Egypt by using non-ODS/low GWP technologies and, in this way, contribute to Egypt's compliance with the Montreal Protocol. HCFC phase-out obligations will sharply reducing the industry's contribution to global warming.

- The 1st output addresses the remaining HCFC-141b use in all remaining PU foam applications after foams in Domestic Refrigeration Manufacturing (DRM) sector have been addressed.
- UNDP decided, along with individual projects for larger entities, to use a Group Phase-out Plan approach for the smaller ones, expecting technological and cost benefits through such a group approach in procurement, local works and implementation assistance.

- The 1st output includes the following participants:

PARTICIPANT	PROJECT TYPE	OWNERSHIP	ACRONYM
KIRIAZI Gas Co	Individual	100% Egyptian	Kiriazi
Star Industrial factories	Individual	100% Egyptian	STAR
Beta Technical & Trading Bureau	Group	100% Egyptian	Beta

- The 2nd output includes the following participants:

PARTICIPANT	PROJECT TYPE	OWNERSHIP	ACRONYM
Chemicals for Modern Building	Individual	100% Egyptian	CMB
International company for insulation	Individual	100% Egyptian	Insutech
Modern Plastics	Individual	100% Egyptian	Modern
Chema foam	Individual	100% Egyptian	Chema Foam

- The 3rd output covers the IOC for the same participants of Tranche II.

II. Progress Review

Section 1: Overall progress against Project Dcoument outputs

- Project outcomes

Sustainable management of environment and natural resources incorporated into poverty reduction strategies/ key national development frameworks and sector strategies
HCFC-141b, 142b and 22 use phased-out and replaced by either methyl formate, n-pentane or HFO in PU insulation foam production in 2 beneficiary companies, 24 SMEs and 4 XPS enterprises.

- Project outputs & indicator/s: ....

Project Output 1: 00107118				
Phase-out of HCFC-141b at Kiriazi	Baselines	1.98 ODPT	Phasing-out 1.98 HCFC-141b ODP (18 MT) and shift to a new ozone friendly technology	The multilateral fund secretariat The National Ozone committee
Phase-out of HCFC-141b at Star		3.52 ODPT	Phasing-out 3.52 HCFC-141b ODP (32 MT) and shift to a new ozone friendly technology	
Phase-out of HCFC-141b at Beta		5.4769 ODPT	Phasing-out 5.4769 HCFC-141b ODP (49,79 MT) and shift to a new ozone friendly technology	
Project Output 2: 00122723				
Phase-out of HCFC-142b and HCFC-22 at CMB		4.28 ODPT	Phasing-out 4.28 ODP HCFC-142b and HCFC-22 (73.3 MT) and shift to a new ozone friendly technology	The multilateral fund secretariat The National Ozone committee
Phase-out of HCFC-22 at Insutech		16.50 ODPT	Phasing-out 16.50 HCFC-22 ODP (300 MT) and shift to a new ozone friendly technology	
Phase-out of HCFC-22 at Modern		11.00 ODPT	Phasing-out 11 HCFC-22 ODP (200 MT) and shift to a new ozone friendly technology	
Phase-out of HCFC-22 at Chema foam		0.55 ODPT	Phasing-out 0.55 HCFC-22 ODP (10 MT) and shift to a new ozone friendly technology	

Section 2: Progress against each output

Output 00107118

UNDP has launched the implementation of all three (3) foam projects approved by the 79th ExCom:

- Two enterprises manufacturing electric water heaters (Kiriazi and Electrostar)
- One group sub-project implemented through (Beta Technical and Trading Bureau).

To ensure effective technical coordination and support, local and international experts were recruited to assist in project implementation. An initial technical mission was fielded to Cairo to discuss individual implementation plans with the beneficiary companies, followed by a series of subsequent visits..

Three **Memoranda of Agreement (MOAs)** were finalized and signed between the Government of Egypt, the enterprises, and UNDP. International bidding procedures were completed for Kiriazi and Electrostar, suppliers were selected, and all required equipment has been delivered. Beta initiated customer-level trials and successfully started offering commercially viable HCFC-free foam systems in the Egyptian market.

Kiriazi Gas:

The conversion has been designed for the replacement of HCFC-141b with Cyclopentane in the manufacture of PU rigid insulation foam for water heaters. The MOA was signed between Kiriazi, the Government, and UNDP.

All payments have been processed. Equipment specifications were jointly formulated by the technical team and the enterprise. The international bidding was announced, bids received and evaluated at the UNDP Cairo office. Equipment has been delivered, installed, and commissioned. The safety audit was successfully completed by a local consultant, and final payments were released.

Electrostar:

The conversion is identical in scope to Kiriazi Gas, replacing HCFC-141b with Cyclopentane in PU rigid insulation foam production for water heaters. The MOA was signed between star, the Government, and UNDP. All payments have been processed.

Specifications were developed in collaboration with the enterprise, ITB announced, bids evaluated, and equipment delivered. Installation and commissioning have been completed, and the safety audit has been finalized by the local consultant.

Beta:
This group project targets 28 SMEs to replace HCFC-141b with Methyl Formate. The MOA was finalized and signed between Beta, the Government, and UNDP. Beta completed customer-level trials at 28 SMEs, and all beneficiaries signed completion and commitment statements confirming the permanent cessation of HCFC-based systems. All payments for these 28 customers have been processed.

The Executive Committee of the Multilateral Fund approved, at its **84th Meeting**, the **second tranche** of Stage-II of the HPMP (2018–2019) at a total funding of **US$ 1,836,750 for UNDP**.

Output 00122723

UNDP has launched the implementation of all four XPS foam projects under HPMP-II. To cover the technical assistance component and ensure proper local coordination, experts were recruited to support implementation. An initial technical mission was conducted in Cairo to define implementation plans for each enterprise, followed by multiple follow-up visits.

Four MOAs were prepared and finalized. Bidding procedures have been completed for all four enterprises (CMB, Insutech, Modern, and Chema Foam). Equipment delivery and installation have been finalized for CMB, Insutech, Modern, and Chema Foam.

CMB:
Conversion was designed for replacement of HCFCs with a 60/40 blend of HFO-1234za and Dimethyl Ether (DME) in XPS foam manufacturing.
The MOA was signed with the Government and UNDP. Under a national implementation modality, Bidding and bid analysis were completed, & the purchase order issued. Local works were conducted by the beneficiary. Equipment has been delivered, installed, & commissioned. HCFC phase-out was achieved, the safety audit completed, and all payments released.

Insutech:
Similar to CMB, the conversion replaced HCFCs with HFO-1234za/DME blend (60/40) in XPS foam manufacturing. The MOA was signed, Bidding and analysis completed, purchase order issued, local works completed, and equipment delivered. Installation and start-up were completed successfully, the safety audit finalized, and all payments released.

Modern:
Conversion designed for HCFC replacement with 60/40 HFO-1234za/DME blend. MOA signed between Modern, the Government, and UNDP, bidding and bid analysis were completed, and a purchase order issued. The first, second and third payments have been released. Equipment has been delivered, installation completed, and HCFC phase-out achieved. The safety audit is expected to be completed during Q1 2026.

Chema Foam:
Conversion designed for **HCFC replacement with 60/40 HFO-1234za/DME blend**. MOA signed between Chema Foam, the Government, and UNDP, the first, second, and third payments have been processed. Bidding and analysis completed, purchase order issued, and local works executed by the beneficiary. Equipment has been delivered, installation completed, and HCFC phase-out achieved. The **safety audit** is expected to be finalized during **Q1 2026**.

Output 00132893

This output covers the Incremental Operating Costs (IOC) for the four XPS beneficiaries (CMB, Insutech, Modern, and Chema Foam).
The IOC represents the additional operational expenses associated with adopting the new alternatives compared to the previous HCFC-based systems.

Bidding procedures have been completed by the beneficiaries. Purchase orders were issued, and HFO refrigerants were delivered to each enterprise based on their respective consumption levels and allocated funding.

2.1 Progress towards Outputs (achieved/Not achieved):

Output 00107118 – HCFC Phase-out in Foam Sector
During the reporting period, implementation of all three foam projects was completed as planned. Conversion from HCFC-141b to cyclopentane and methyl formate was successfully achieved in two large enterprises (Kiriazi and Electrostar) and in 28 SMEs through the group project implemented by Beta Technical and Trading Bureau.
All technical equipment was delivered, installed, and commissioned; safety audits were finalized for Kiriazi and Electrostar, while Beta completed customer-level trials and obtained written commitments from all SMEs to permanently discontinue HCFC-based foam systems. These results contributed directly to the elimination of approximately 100 metric tons of HCFC-141b consumption,

Output 00122723 – XPS Foam Conversion Projects
Implementation of all four XPS enterprises (CMB, Insutech, Modern, and Chema Foam) progressed significantly during the reporting period.
CMB and Insutech have completed full conversion to non-HCFC technology (HFO-1234za/DME blend), with safety audits completed and operations now fully HCFC-free. Modern and Chema Foam completed equipment installation and start-up, and both are expected to finalize safety audits in Q1 2026.
As of the reporting date, two out of four XPS enterprises (50%) have achieved full conversion, while the remaining two are in the final audit stage.

Output 00132893 – Incremental Operating Cost (IOC) for XPS Enterprises

IOC disbursement was partially completed during the reporting period. Two of the four XPS beneficiaries (CMB and Chema Foam) received their full allocated quota of HFO-based blowing agents based on verified consumption and corresponding payments were fully processed.

For the remaining two enterprises (Modern and Insutech), partial disbursements were made to cover initial deliveries, while The remaining funds will be released upon procurement of the balance of their allocated HFO quantities, in accordance with project guidelines and verified consumption data.

This phased approach ensured the continuity of HCFC-free production while maintaining compliance with the agreed financial and technical milestones. Overall, IOC implementation stands at approximately 45% completion, with full delivery and payment expected to be finalized by the end of 2026.

Results Planned but Not Fully Delivered

While the majority of planned results were achieved, certain activities experienced minor delays:

- **Modern Foam and Chema Foam -safety audits**: Due to external market and logistical constraints, final safety audits were rescheduled and are now expected to be completed in **Q1 2025**.
- **Insutech and Modern Foam - IOC disbursement:** Both enterprises have not yet completed the **procurement of their full allocated quantities of HFO-based blowing agents**. The remaining payments will be processed upon confirmation of the additional purchases, in line with the approved project guidelines.

Despite these limited delays, the overall implementation remains **on track**, with cumulative progress at **84%** and all outputs expected to be fully completed by **the end of 2026**.

2.2 Please provide additional comments on targeting of beneficiaries, sustainability of results, strengthening national capacities.

Targeting	Who is the projct targeting? Were you able to reach the project's beneficiaries? PU foam users , Large and SMEs consumers, XPS Foam producers, yes we were able to reach all the beneficiaries.
Sustainability	What are the actions taken toward sustainability? Coordinating with the NOU to ensure that all the companies under the project are not allowed to import HCFC's.
National capacities	How was national capacities enhanced? By training and field visits for employees of The National ozone Unit
Innovation	Has the project used any innovative tools No
South-South Cooperation	Has there been any cooperation with other Government No
Knowledge Products	What are knowledge products from the project; i.e. strategy , guidelines, SOPs etc.. Guide book for technicians

III. Monitoring and Evaluation

The **National Ozone Unit (NOU)** operates under the **Ministry of Environment**, reporting directly to the **Egyptian Environmental Affairs Agency (EEAA)**. The NOU will continue to assume overall responsibility for the implementation and monitoring of ODS phase-out programmes, including the HPMP.

Under the direct supervision of the NOU, the monitoring process will be conducted in close cooperation with relevant national authorities, with technical assistance from the **Lead Implementing Agency (IA)** and **Cooperating IAs**.

A **monthly progress report** will be submitted to the **CEO of EEAA**, a **quarterly progress report** will be presented to the **National Ozone Committee**, and an **annual progress report** will be submitted to **UNDP Country Office (CO)**.

These reports will include:

- Progress data showing results achieved against pre-defined output-level targets,
- A project quality rating summary,
- An updated risk log with mitigation measures, and
- Any evaluation or review reports prepared during the reporting period.

The **National Ozone Committee** shall convene once every three months, at a time determined by the Committee Chairperson, or whenever deemed necessary. The Committee may invite experts or advisers to attend its meetings as required.

Following each meeting, the Chairperson of the Committee shall present a summary of its deliberations and recommendations to the **Minister of Environment**.

MONITORING SCHEDULE				
Monitoring Action	**Due by**	**Completion date**	**Comments**	**Responsibility**
Progress report	Monthy			NOU
Financial Report	Quarterly			EEAA
Bi-Annual Report	Yearly			UNDP
Annual Report	Yearly			UNDP

IV. Key Challenges, Lessons Learned and Recommendations

Key Challenges

- **Diversity of alternatives:** A wide range of **HCFC-141b alternatives** - including hydrocarbons, methyl formate, HFCs, and water-based systems - was required to meet the specific needs of different foam manufacturers and applicators. This increased the complexity of technology selection and adaptation for each enterprise.
- **Administrative and procedural constraints:** The need to **revise and update the project implementation modality** arose to minimize bureaucratic delays and streamline coordination among stakeholders.
- **Global economic factors:** The **delayed shipping of equipment** due to international logistics disruptions and the economic situation impacted implementation timelines.
- **Limited availability of HFO technology:** The **alternative technology (HFO)** identified in the project document faced **supply shortages** in the local market, leading to delays in equipment commissioning and start-up.
- **High cost of HFO technology:** The **price of HFO-based systems** remained significantly higher compared to technologies already used by the beneficiaries, creating financial and operational challenges during conversion.

Lessons Learned

- Flexibility in **technology selection and implementation modalities** is essential to ensure continuity and adaptability under changing market conditions.
- Strong **communication between implementing agencies, suppliers, and enterprises** proved critical in overcoming logistical and procurement-related challenges.
- The **use of locally available alternatives**, where technically feasible, can significantly reduce project risks and accelerate conversion timelines.

Recommendations

- Future projects should incorporate **contingency mechanisms** to address supply chain disruptions and fluctuations in global prices of alternative technologies.
- Continuous **capacity-building and technical training** for local enterprises should be maintained to enhance the safe adoption of emerging low-GWP technologies.
- Enhanced **coordination with suppliers and financial institutions** could support smoother access to environmentally friendly technologies and reduce delays caused by market instability.

V. Update on risks and mitigation measures

Risks	Mitigation Measures
Delays in equipment delivery and customs clearance, which affected installation schedules and caused financial losses to the receiving enterprises.	UNDP engaged with the relevant national authorities - particularly the Ministry of Foreign Affairs and Customs - to expedite clearance procedures and facilitate timely delivery. Continuous follow-up and coordination meetings were conducted to resolve pending logistical issues.
Enterprises not adequately prepared for installation, resulting in delays and additional storage or handling costs.	The international consultant provided on-site technical guidance and detailed recommendations during multiple field visits. These interventions significantly accelerated site preparation and ensured readiness for installation in accordance with safety and technical standards.
Limited availability and high price of alternative technologies (HFO-based systems), leading to procurement delays and financial pressure on enterprises.	UNDP and the National Ozone Unit (NOU) are maintaining close communication with suppliers to ensure continuous availability of HFO materials. Enterprises are being supported to plan procurement in advance and explore cost optimization measures, while coordination with the Multilateral Fund Secretariat continues to ensure financial feasibility.

VI. Partnerships and Sustainability

- Ministry of Environment / Egyptian Environmental Affairs Agency (EEAA)
- National Ozone Unit (NOU)
- Multilateral Fund Secretariat (MLFS)
- United Nations Industrial Development Organization (UNIDO) - Lead Agency for HPMP
- System Houses (SHs) – Beta Technical & Trading Bureau
- National Companies (Kiriazi, Star, CMB, Insutech, Modern & Chema foam)

VII. Financial Summary

Table 1: Overview of available resources for the reporting period

Donor	Opening Balance	Allocations/ funds received in 2018	Total
Multilateral Fund for the Implementation of Montreal Protocol		3,695,722 $	3,695,722 $
Total			

Table 2: Overview of budget and expenditure per output

Output	Budget		Expenditures		Balance
	MLF	Total	MLF	Total	
00107118	1,042,352 $	1,042,352 $	1,042,352 $	1,042,352 $	0 $
00122723	1,836,750 $	1,836,750 $	1,627,533 $	1,627,533 $	209,217 $
00132893	816,620 $	816,620 $	308,822 $	308,822 $	507,798 $
Total	**3,695,722 $**	**3,695,722 $**	**2,978,707 $**	**2,978,707 $**	**717,015 $**

Annex I: Annual Work Plan 2026

EXPECTED OUTPUTS	PLANNED ACTIVITIES	Planned Budget by Quarter				RESPONSIBE PARTY	PLANNED BUDGET		
		Q1	Q2	Q3	Q4		Funding Source	Budget Description	Amount
Output 2 #122723: XPS Foam Sector: Phase-out of 583.30 MT of HCFC's. ICC	2.1 Activity Chema Foam - Safety Audit	X	X			Project Manager, UNDP country office, International & local experts, UNDP/MPU	MLF		36,500 $
	2.1 Activity Modern - Safety Audit	X	X						56,500 $
	2.3 PMU - National Consultant Fees - Project Manager Salary - Travel Cost - Workshops and Trainings expenses	X	X	X	X				92,217.23 $
	Sub-Total for Output 2								**185,217.23 $**
Output 3 #132893: XPS Foam Sector: IOC for XPS Foam sector	3.2 IOC for CMB				X	Project Manager, UNDP country office, International & local experts, UNDP/MPU	MLF		11,173.84 $
	3.2 IOC for Insutech				X				351,335.72 $
	3.3 IOC for Chema Foam				X				1,451.25 $
	3.4 IOC for MODERN				X				143,836.97 $
	Sub-Total for Output 3								**507,797.78 $**
Evaluation *(as relevant)*	EVALUATION								
General Management Support									
TOTAL									**693,015 $**

Annex II: Assets inventory

SECTION 7: ASSETS LIST									
Asset ID	**Description**	**Type**	**Serial No.**	**Tag No.**	**Model**	**Location**	**Acquisition Date**	**Currency**	**Cost**
1	Mac Laptop	Electical	5CD0123XYS		Pro II	Maadi	2/11/2023	EGP	81,399.99

Certified by: Project Manager's signature

Date: 13 November 2025



Annex III: Markers

[Resources] The availability of **funds from the Multilateral Fund (MLF)** ensured stable financing for all planned activities. The design of the project allowed flexibility in reallocating resources between foam and XPS beneficiaries, which enabled smooth progress despite market price fluctuations.	**[Resources]** The **high global price of HFO alternatives** and their intermittent availability negatively affected the cost-effectiveness of planned conversions. Corrective action: UNDP and the NOU engaged with multiple suppliers to diversify sourcing channels and encouraged beneficiaries to plan procurement earlier to avoid shortages.
[Hows] UNDP's **National implementation modality**, combined with strong technical support from international consultants, accelerated procurement, equipment delivery, and installation. Regular field missions and continuous follow-up with enterprises were key to solving site-preparation delays and ensuring compliance with safety requirements.	**[Hows]** Delays in customs clearance and international logistics limited the effectiveness of UNDP procurement timelines. Corrective action: UNDP increased engagement with the Ministry of Foreign Affairs and customs authorities to fast-track pending shipments.
[Whos] Beneficiary enterprises successfully transitioned to **HCFC-free foam technologies**, improving workplace safety, reducing environmental impact, and increasing long-term competitiveness. SMEs in the group project (Beta) particularly benefited from targeted technical support and cost-sharing models that ensured *no enterprise was left behind*.	**[Whos]** he high cost of HFO alternatives created financial pressure on some beneficiaries. Corrective action: IOC support and staggered payments were introduced to reduce the financial burden and support continuous production.

[Partnerships] Strong collaboration between **UNDP, UNIDO (Lead IA), and EEAA (NOU)** ensured aligned implementation timelines and harmonized technical decisions. Partnerships with local consultants strengthened national capacity and provided rapid on-ground troubleshooting.	**[Partnerships]** Some equipment suppliers faced repeated delays due to international logistics disruptions. Corrective action: UNDP expanded engagement with alternative vendors and encouraged earlier order placements.
[Joint Programming] Joint implementation with **UNIDO** ensured technology harmonization, unified reporting to the MLF, and avoided duplication of efforts. This resulted in efficient resource utilization and consistent sector-wide standards.	**[Joint Programming]** Different agencies sometimes operate at different speeds, causing occasional misalignment. Corrective action: More frequent coordination meetings and unified implementation calendars were established.
[SSC/TrC] Exchange of technical knowledge with countries in the region through **South-South cooperation platforms** enriched national expertise. Beneficiaries gained exposure to successful conversion models used by peer countries.	**[SSC/TrC]** Limited access to some regional technologies or suppliers constrained the benefits of SSC. Corrective action: UNDP leveraged global dialogues to connect Egyptian enterprises with broader networks.
[Humanitarian] directly applicable to this project.	**[Humanitarian]** No humanitarian-related constraints were identified as the project is environmental/industrial in nature.