United Nations Development Programme

Project Document

Project title: HCFC Phase-out Management Plan – Stage II		
Country: Ghana	**Implementing Partner:** Environmental Protection Agency	**Execution Modality:** National Implementation Modality (NIM)
Contributing Outcomes (United Nations Sustainable Development Partnership - UNSDP): • Outcome 5: Environmental governance at national and local levels is effective, efficient and coherent • Output 5.1: National and sub-national institutions have greater capability to implement environment- and climate-related policies in line with global conventions		
UNDP Social and Environmental Screening Category: Low Risk	**UNDP Gender Marker: 2**	
Atlas Award ID: 00142097	**Atlas Project/Output ID:** 00130456	
UNDP- PIMS ID number:	**LPAC meeting date:** December 2021	
Planned start date: January 2022	**Planned end date:** December 2030	

Brief project description:

The Montreal Protocol on Substances that Deplete the Ozone Layer of which Ghana is a signatory to was designed to reduce the production and consumption of ozone depleting substances (ODS) such as Hydrochlorofluorocarbons (HCFCs), to reduce their abundance in the atmosphere, and thereby protect the earth's fragile ozone Layer. Ghana's consumption of HCFCs is in the servicing of refrigeration and air conditioning equipment. Historically, Ghana has consumed significant quantities of HCFC-22 used to repair and service residential, commercial and industrial refrigeration and air conditioning equipment.

Following the phase-out of the consumption of CFCs in the domestic and commercial refrigeration equipment, significant quantities of HCFC-containing blends have been introduced and their use continues to grow. It was therefore imperative that strategic measures are taken to reduce and eliminate the use of such ODS containing equipment from the Ghanaian market to protect the climate and to ensure Ghana's compliance with the Montreal Protocol of which it is a signatory to. With support from the Multilateral Fund, Ghana initiated the implementation of the Stage 1 of the HPMP from 2010 and is expected to be completed by end of 2021. Activities were implemented through six-tranches of Funding with expectation to achieve a 35% ODS reduction from its baseline by 2020. These interventions beyond compliance to the Montreal Protocol, contributes largely to Ghana's achievement of the SDGs, particularly Goal 12 (Responsible Consumption and Production).

Through HPMP activities such as trainings, awareness creation, investment in technologies, policy development and monitoring support, Ghana has experienced significant reduction in ODS consumption. Notably, activities of the HPMP Stage I led to the achievement of the following results;

- Establishment of a licensing and quota system to regulate the import and exportation of HCFCs and HCFC-based equipment;
- Development of legal framework to promote the introduction and use of refrigerants in the Ghanaian market. LGW and zero ODS;
- Establishment of three centers of excellence in the southern and middle belt of Ghana, complemented with tools and equipment to facilitate trainings;
- Training of over 770 technicians across the country on good servicing practices and safe handling of refrigeration alternatives;
- initiation of a certification system to regulate the practices of HC conversion among servicing technicians; and,
- Capacity building and technology support to the Customs Unit of Ghana to facilitate the control of ODS substances and ODS-based equipment.

Having achieved these results in the Stage I of the HCFC phaseout management plan, new set of strategies and activities have been designed through the Stage II to achieve a 67.5% HCFC reduction by 2025, and complete HCFC phase-out by 2030 with a servicing tail until 2040. The project shall seek to achieve these broader goals through the establishment of policy and regulatory frameworks for the use of Hydrocarbon (HC) refrigerants, awareness creation, training and certification, the promotion of best available technology and practices.

FINANCING PLAN	
Multilateral Fund (Direct project Grant)	USD 1,618,677 *(UNDP-USD 1,159,970: UNDEP-USD 458,707)*
Government of Ghana (Co-financing)	USD 15,000
Grand-Total Project Financing	**USD 1,633,677**
UNDP support cost	USD 81,198
UNEP support cost	USD 59,632
Total Resource from Multilateral Fund (Including support cost)	**USD 1,759,507**

SIGNATURES		
Signature: Henry Kokofu Executive Director - Environmental Protection Agency	**Agreed by Implementing Partner**	**Date/Month/Year:** 23/02/22
Signature: Angela Lusigi Resident Representative – UNDP Ghana	**Agreed by UNDP**	**Date/Month/Year:** 17/03/22

I. GLOSSARY

CFCs:	Chlorofluorocarbons
EPA:	Environmental Protection Agency
ExCom:	Executive Committee
HCFC:	Hydrochlorofluorocarbons
HPMP:	Hydrochlorofluorocarbon Phaseout Management Plan
Low GWP:	Low Global Warming Potential
LPAC:	Local Project Appraisal Committee
MDA:	Ministries, Department and Agencies
MESTI:	Ministry of Environment, Science, Technology and Innovation
MLF:	Multilateral Fund
NACODS:	National Committee on Ozone Depleting Substances
NARWOA:	National Air conditioning and Refrigeration Workshop Owners Association
NGOs:	Non-Governmental Organisations
NOU:	National Ozone Unit
ODS:	Ozone-depleting substances
RAAG:	Refrigeration and Air-Conditioning Engineers Association of Ghana
RAC:	Refrigeration and Air conditioning
SBAA:	Standard Basic Assistance Agreement
SDGs:	Sustainable Development Goals
UNDP:	United Nations Development Programme
UNDP CO:	United Nations Development Programme Country Office
UNDP MPU:	United Nations Development Programme Montreal Protocol Unit
UNEP:	United Nations Environment Programme
UNSDP:	United Nations Sustainable Development Partnership

II. DEVELOPMENT CHALLENGE

Ozone depleting substances are man-made gases that destroy ozone once the gases reach the ozone layer. They include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halons, methyl bromide, carbon tetrachloride and methyl chloroform. These compounds undergo decomposition in the higher reaches of the atmosphere (stratosphere) due to sunlight. Resulting chlorine atoms catalyse the decomposition of the ozone gas creating wide spaces in the protective ozone layer, thus allowing harmful ultraviolet rays to reach earth's surface. HCFCs are both ODS and powerful greenhouse gases: the most commonly used HCFC is nearly 2,000 times more potent than carbon dioxide in terms of its global warming potential (GWP)[1].

The Montreal Protocol on Substances that Deplete the Ozone Layer was therefore designed to reduce the production and consumption of ozone depleting substances to reduce their abundance in the atmosphere, and thereby protect the earth's fragile ozone Layer.

Ghana's consumption of HCFCs is mainly in the servicing of refrigeration and air conditioning equipment. Notably, about 94 percent of Ghana's HCFC consumption is in the stationery AC sector. Historically, Ghana has consumed significant quantities of HCFC-22 used to repair and service residential, commercial and industrial refrigeration and air conditioning equipment. Following the phase-out of the consumption of CFCs in the domestic and commercial refrigeration equipment, significant quantities of HCFC-containing blends have been introduced and their use continues to grow. It therefore became imperative that strategic measures are taken to reduce and eliminate the use of such ODS containing equipment from the Ghanaian market to protect the climate and to ensure Ghana's compliance with the Montreal Protocol of which it is a signatory to.

Through activities of the HPMP Stage I, significant results were achieved including notably the achievement of the 35 percent ODS consumption reduction target set under the Montreal Protocol for Ghana. However, there are still prevailing gaps in the governance, monitoring and practice in the refrigeration and air conditioning sector which requires that measures are put in place for key actors such as government regulatory institutions, customs control, refrigeration technicians and training institutions to play their respective roles in facilitating the achievement of a 100 percent ODS consumption reduction by end of 2030.

III. STRATEGY

Through the implementation of the HPMP Stage I, Ghana was able to reduce its baseline ODS consumption by 70 percent and shall therefore adopt a more stringent approach in the Stage

[1] https://www.unep.org/ozonaction/who-we-are/about-montreal-protocol

II to phase out the consumption of ODS substances in the Ghanaian market.

An accelerated HCFC phaseout schedule has been agreed with the Multilateral Fund as presented in the table below.

Table 1: Maximum allowable consumption targets in stage II of the HPMP for Ghana

Description	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Maximum allowable level under the Montreal Protocol	37.21	37.21	37.21	37.21	18.61	18.61	18.61	18.61	18.61	0.00
As originally proposed by the Government	20.00	20.00	15.00	15.00	15.00	12.00	12.00	12.00	8.00	0.00
As agreed	20.00	16.98	15.00	15.00	12.00	8.50	8.50	8.50	5.00	0.00
Percentage of baseline (%)	65	70	74	74	79	85	85	85	91	100

Based on the agreed consumption targets between Ghana and the Multilateral Fund, the phaseout of HCFCs will be completed by 2030 with a servicing tail up to 2040, with the allowance for the servicing tail consistent with Article 5, paragraph 8 ter(e)(i) of the Montreal Protocol. Additionally, a ban on imports of HCFC-based equipment will come into effect from 1 January 2025.

Furthermore, Ghana shall apply a quota control on the imports of HCFC-22-based equipment no later than 1 January 2023 to gradually reduce imports. Specifically, Government will freeze the import quota for HCFC-22-based split ACs at 11,450 units in 2022 (2019 level) and reduce it to 5,725 units in 2023 and zero in 2025.

In line with decision 86/51 on the matter of servicing tail, to allow for consideration of the final tranche of its HPMP, the Government of Ghana shall submit a detailed description of the regulatory and policy framework in place to implement measures to ensure that HCFC consumption would be in compliance with paragraph 8 ter(e)(i) of Article 5 of the Montreal Protocol for the 2030-2040 period. The Government shall also submit the expected annual HCFC consumption in Ghana for the 2030-2040 period.

To facilitate the achievement of the broader targets the project shall adopt these additional strategies to facilitate Ghana's journey towards zero consumption of ODS by 2030.

- **Enabling regulatory frameworks for adoption of low-GWP technologies**

Government shall undertake several regulatory measures to create an enabling environment for the adoption of low-GWP technologies. This shall include reducing tariffs on imports of R-290 refrigerants and products and increasing tariff for HCFC-22 and high-GWP refrigerants (R-404A, R-407C, R-410A, R-507C).

Additional regulatory measures shall include the reduction in import quotas for HCFC-22-based ACs and banning imports of HCFC-22-based ACs from 1 January 2025.

- **Promotion of R290-based technology through demonstration and certification**

Considering that the new R-290-based equipment is still widely used and easily available in Ghana, the Stage II shall leverage on the conversion conducted in Stage I and the certification system for technicians provide assurance to manufacturers of R-290 equipment to introduce new R-290-based equipment into Ghana.

Additionally, the project shall undertake an R-290 replacement activity to promote its uptake in the stationary AC sector. This includes purchasing 71 units of R-290 ACs to replace HCFC-22-based units at a hostel facility, evaluate the energy efficiency performance, preparing awareness-raising materials based on the result of the evaluation, and conducting workshops/seminars and awareness-raising activities to disseminate the outcomes.

This demonstration is expected to showcase the R-290 technology to end-users, provide data demonstrating its advantage in energy saving, increase awareness about R-290 technologies and avoid a growth in imports of R-410A-based ACs.

- **Training and provision of best available tools**

The HPMP Stage II shall focus inter alia, training in the safety aspects of adopting R-290 technologies, as well as the provision of tools and equipment to enable training in the safe handling of flammable refrigerants, and the certification of technicians. This will be complemented by the training of customs officers supported with tools to enhance the monitoring of ODS-based imports and exports, in line with the national consumption reduction targets.

Gender mainstreaming and women empowerment

The refrigeration and air-conditioning sector in Ghana have over the years been male dominated. This has been due to the longstanding social norm that science and technology are better suited to males. In Stage II of the HPMP implementation, gender will be mainstreamed in the design, implementation, monitoring and evaluation of the project's activities with a special focus on empowering women to find livelihood in the refrigeration and cooling sector as an attractive option.

Gender equality will be emphasized in the implementation of various activities, including policy development, training and the decision-making process. In particular, the project plans to train a minimum of 150 female technicians in the RAC trainings. This is in-line with the operational policy on gender mainstreaming for Multilateral Fund-supported projects (decision 83/68(c)), which recommends that adoption of a gender-sensitive approach in the design and implementation of Multilateral Fund-supported projects.

IV. RESULTS AND PARTNERSHIPS

Expected Results

The HCFC Implementation Plan Stage II has been designed to support Ghana remain compliant with the Montreal Protocol through the achievement of a 100percent ODS-consumption phaseout by 2030. Periodic targets are specified in the table below.

NO	YEAR	REDUCTION TARGET
1	2022	70%
2	2023	74%
3	2025	79%
4	2026	85%
5	2029	91%
6	January 2030	100%

The expected results shall be achieved through the implementation of the following activities.

- **Output 1: Regulatory Environment Established**
  - Activity 1.1 Establishing policy and regulations, updating safety guidelines for the use of HC refrigerants (UNEP, $25,000).
- **Output 2: Target Groups sensitized and trained through awareness-raising /Capacity building**
  - Activity 2.1: Training of 20 trainers and 600 customs officers in ODS import control and the prevention of illegal trade. (UNEP, $75,000).
  - Activity 2.2: Purchasing of 13 refrigerant identifiers. (UNDP, $62,150).
  - Activity 2.3: Strengthening the capacity of NARWOA by conducting professional workshops/seminars to encourage its members to conduct good servicing practices (UNEP, $20,000; UNDP, $130,000).
  - Activity 2.4: Awareness raising and training activities on alternative technologies to HCFC, low-GWP cooling systems and maintaining /improving the energy efficiency of RAC systems. (UNEP, $100,000)
  - Activity 2.5: Awareness creation and information dissemination on alternative technologies for importers, distributors and retailers of controlled substance and equipment. (UNEP, $90,000).
- **Output 3: Technicians in RAC sector trained for certification Programme**

- Activity 3.1: Provide support for four centres of excellence in the training of 1,400 technicians in good servicing practices and the safe handling of flammable refrigerants through the provision of equipment and tools. (UNDP, $100,000)
- Activity 3.2: Provide support for five universities by training trainers and providing equipment and tools to facilitate the inclusion in the curriculum of safe handling of flammable refrigerants and the training of 1500 technicians (UNDP, $239,315)
- Activity 3.3: Implementing the certification of RAC technicians (UNEP, $58,707)

- **Output 4: Recovery Recycling and Recovery Programme**
  - Activity 4.1: Provide equipment and tools to 50 workshops and training of 450technicians in refrigerant recovery and recycling, and retrofitting of HC refrigerants (UNDP, $230,500; UNEP, $50,000).
  - Activity 4.2: Support the RAAG to participate in international meetings, subscribing to technical literature and organizing national workshops and seminars. (UNDP, $50,100; UNEP, $10,000).
  - Activity 4.3: Establish two refrigerant reclamation centres (UNDP, $140,000).
- **Output 5: The adoption of R-290 technology and environmentally sound alternative technologies effectively facilitated**
  - Activity 5.1: Demonstrate R-290 AC technology by replacing 71 units of HCFC-22 AC with R-290-based ACs in a hostel, communicating and disseminating the results and raising awareness on r-290 technology (UNDP, $60,000; UNEP, $30,000).

Resources Required to Achieve the Expected Results

A total funding of USD 1,618,677 has been allocated by the Multilateral Fund to support the implementation of the project from 2021 to 2030. This is complemented by a co-financing of $15,000 from the Government of Ghana.

These resources shall be made available in five payment tranches through the United Nations Development Programme and United Nations Environment Programme for the implementation of activities approved by the Executive Committee of the Multilateral Fund. Under the leadership of the Environmental Protection Agency, the National Ozone Unit will lead project implementation is partnership with national stakeholders and with technical support from the United Nations Development Programme and United Nations Environment Programme.

Partnerships

The Environmental Protection Agency and project Executing Agencies shall explore partnerships with relevant institutions, programmes and projects with bearings on the broad

objectives and activities of the HPMP Stage II to find synergies. Notably, partnerships with the Green Cooling Africa Initiative (GCAI) project shall be strengthened to increase joint efforts towards sustainable cooling, which is a key objective of both projects.

Additionally, the project shall explore partnerships with planned and ongoing national activities under the Paris Climate Change Agreement with relevance to refrigeration, cooling and energy efficiency. This will be with the aim of harmonizing national efforts under this thematic area to achieve common targets under the Montreal Protocol and the Paris Climate Change Agreement.

Stakeholder Engagement

No	Project Stakeholder	Roles & Responsibilities
1	Ministry of Environment, Science, Technology and Innovation	The overall objective of MESTI is to ensure accelerated socio-economic development of the nation through the formulation of sound policies and a regulatory framework to promote the use of appropriate environmentally friendly, scientific and technological practices and techniques. • Responsible for building a strong national scientific and technological base for accelerated sustainable development to enhance the quality of life for all.
2	Environmental Protection Agency	The Government entity responsible for the implementation of policies on all aspects of the environment. • The EPA will serve as the main Governmental counterpart providing national leadership. • The EPA which also serves as the Montreal Protocol focal point for Ghana will be responsible for the day-to-day compliance with the treaty and its provisions. EPA serves as location for the National Ozone Unit.
3	United Nations Development Programme	UNDP serves in many respects as the operational arm of the United Nations at the country level and works with partners in numerous countries to promote among other things, sustainable development, eradication of poverty, advancement of women, good governance and the rule of law. UNDP represented by the Ghana Country Office is interested in enhancing its development activities in National systems and existing institutional arrangements for promotion of environmental sustainability, green economy and climate change mitigation and adaptation at the district, regional and national levels.

		UNDP will provide technical and administrative support for the implementation of this project.
4	United Nations Environment Programme (UNEP)	The United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment. UNEP will provide technical and administrative support for the implementation of this project.
5	Ministries, Departments and Agencies.	Ministry of Finance, Ministry of Trade and Industry, Centre for Scientific and Industrial Research, Energy Commission, Department Factories Inspectorate (DFI), Ghana Meteorology, Ghana Revenue Authority (CEPS). These institutions will provide technical support to the National Ozone Unit in the project implementation and would carry out specific roles when needed, through the decision of the Project Steering Committee.
6	Private Sector	They are the importers, distributors and retailers that are engaged in the sale of chemicals and products controlled under the Montreal Protocol. They will also be among the target group for awareness raising.

South-South and Triangular Cooperation (SSC/TrC)

This project is being implemented in other countries where UNDP and UN Environment Programme are providing technical guidance. For UNDP, countries such as Kenya, Nigeria, South Africa, Brazil, Indonesia and Lebanon, among others are being supported, whiles UNEP is also assisting about 73 countries on the HPMP Stage II[2]. The UNDP Montreal Protocol Unit and UN Environment Programme shall promote exchanges of lessons learned and best practices among these countries to enhance learning and strengthening of project implementation processes.

Knowledge

This project will create awareness through different forums among targeted groups on the provisions and targets of the Montreal protocol and the responsibilities these target groups must play to ensure a significant reduction in the release of ozone depleting substances in the atmosphere. These target groups will be systematically engaged to ensure that information and knowledge shared will be disseminated broadly in communities.

[2] https://www.unep.org/ozonaction/what-we-do/projects-and-cap-services/projects

Knowledge generated and lessons learnt from these activities will be shared among stakeholders.

Sustainability and Scaling Up

The project will use the existing structures in place at the Environmental Protection Agency to implement Montreal Protocol related activities. This is to ensure national ownership and leadership for the process, and the strengthening of national capacity for future activities. The National Ozone Unit under the guidance of the EPA and other national stakeholders will set up technical teams to lead the implementation of activities. In addition, EPA and the National Ozone Unit will receive technical support from UNDP and UNEP, hence strengthening current national capacities in this sector.

V. PROJECT RESULTS FRAMEWORK (UNDP -SPECIFIC)

Sustainable Development Goal (s): SDG Goal 12: Responsible Consumption and Production					UNDP Strategic Plan Indicator:
Outcome included in the UNSDP: Outcome 5: Environmental governance at national and local levels is effective, efficient and coherent					
Overarching expected results: Achieve 100% ODS-consumption phaseout by January 2030. Specific milestones are as follows: 70% (2022), 74% (2023), 79%(2025), 85% (2026), 91% (2029), and 100% (January 2030).					
Project outputs (Per MLF approval)	**Indicators**	**Baseline (2020)**	**Target (2030)**	**Means of Verification**	**Assumptions**
Output 2: Target Groups sensitized and trained through awareness-raising /Capacity building	Number of refrigerant identifiers procured for Customs Division	6	19	Procurement PO, Asset transfer document	The EPA/UNDP CO has capacity to conduct procurement in time.
	Number of workshops/seminars organized to strengthen the capacity of NARWOA	0	8	Training reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
Output 3: Technicians in RAC sector trained for certification Programme	Number of technicians trained through four centres of excellence in good servicing practices and the safe handling of flammable refrigerants through the provision of equipment and tools.	778	2,178	Training reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Minimum number of female technicians trained	5	155	Training reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of trainings conducted in centres of excellence for technicians	0	10	Training reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of universities supported through ToT, and the provision of equipment and tools to facilitate the inclusion safe handling of flammable refrigerants in their curriculum.	0	5	Training reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of workshops conducted for universities	0	10	Meeting reports	The EPA and relevant partners shall have capacity and no public health

					restrictions to undertake physical trainings.
	Number of technicians trained through curriculum developed with universities	0	1,500	Meeting reports, updated curriculum	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
Output 4: Recovery Recycling and Recovery Programme	Number of workshops supported with equipment and tools to 50 workshops	11	51	Procurement PO, Asset transfer document	The EPA/UNDP CO has capacity to conduct procurement in time.
	Number of technicians trained in refrigerant recovery and recycling, and retrofitting of HC refrigerants	0	300	Training report	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number workshops (national/international) RAAG has been supported to organize/ participate	0	8	Meeting report	The EPA, RAAG and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of refrigerant reclamation centres established	0	2	Certification on works completion, media report	The EPA/UNDP CO has capacity to conduct procurement in time.
Output 5: The adoption of R-290 technology and environmentally sound alternative technologies effectively facilitated	Units of HCFC-22 ACs replaced with R-290-based ACs to demonstrate its efficiency	0	45	Completion of installation certificate	The EPA/UNDP CO has capacity to conduct procurement in time; There are in-country service providers with capacity to conduct installation and monitoring
	Number of awareness creation activities undertaken on demonstration exercise	0	1	Media report	EPA and UNDP CO have capacity to engage media efficiently on information dissemination

VI. MONITORING AND EVALUATION (M&E) PLAN

In accordance with UNDP's programming policies and procedures, the project will be monitored through the following monitoring and evaluation plans:

- Project monitoring and evaluation will be conducted in accordance with established UNDP procedures and will be provided by the project team and the UNDP Country Office (UNDP-CO) with support from the UNDP/MPU Chemicals team. This will be done through project implementation reviews, quarterly review reports, annual reports and a Project terminal report.
- Monitoring and evaluation (M&E) for this project will rely on several levels of review, quality control and feedback. Overall M&E will be conducted by UNDP through regular follow-up on the work programme by the UNDP Ghana Country office. Data collected through quarterly and annual reports shall be collated to track progress in achieving project results based on the results framework.

Quarterly monitoring

The EPA National Ozone Office with Technical support from UNDP and UNEP shall develop quarterly reports on project activities with emphasis on results, lessons and gaps that requires strengthening. These reports shall be reviewed to ascertain progress made in project implementation with solutions identified for existing challenges and gaps.

Annual Reporting

An annual report that harmonizes all quarterly reports shall be developed focusing on activities implemented in the year, outstanding activities, key results, challenges and new opportunities. Data collated through this reporting shall be inputted and monitored in the UNDP Enhanced Results Based Management Platform. Through this process, the project's risk log shall also be updated in ATLAS.

Periodic Monitoring

A detailed schedule of project reviews meetings will be developed by the Project Management team (EPA Ozone Unit, UNDP CO, UNEP), in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Report. Such a schedule will include: (i) tentative time frames for Project Steering Committee Meetings, and (ii) project-related Monitoring and Evaluation activities.

Day to day monitoring of implementation progress will be the responsibility of the Project Manager based on the project's Annual Work plan and its indicators. The Project Team will inform the UNDP-CO and UNEP of any delays or difficulties faced during implementation so

that the appropriate support or corrective measures can be adopted in a timely and remedial fashion.

End of Project

During the last three months, the project team will prepare the End of Stage II implementation report to be submitted to the Multilateral Fund. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learnt, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Monitoring Plan

Monitoring Activity	Purpose	Frequency	Expected Action	Partners (if joint)	Cost (if any)
Measurement of Means of Verification of project results.	Measure project output indicators to establish if they are SMART	Start, mid and end of project. Annually when required.	Review project results framework	EPA/ UNDP Ghana /MPU RTA/UNEP	None
Measurement of Means of Verification for Project Progress on output and implementation	Measure project output indicators to monitor progress in project implementation	To be determined during Annual Work Plan preparation	Collate and measure periodic project data on outputs, indicators and target	EPA/ UNDP Ghana /MPU RTA/UNEP	None
Periodic progress reports	Provide periodic information on project implementation status	Quarterly/ Annually	Collate data on project implementation focusing on progress, results, challenges, and lessons.	EPA/ UNDP CO/MPU RTA/UNEP	None
Visits to field sites	Project team to visit field sites for data collection and project monitoring	Quarterly/ Annually	Visit to project sites installation sites and locations of beneficiaries.	EPA/ UNDP CO /UNDP MPU/UNEP	To be determined during Annual Work Plan preparation

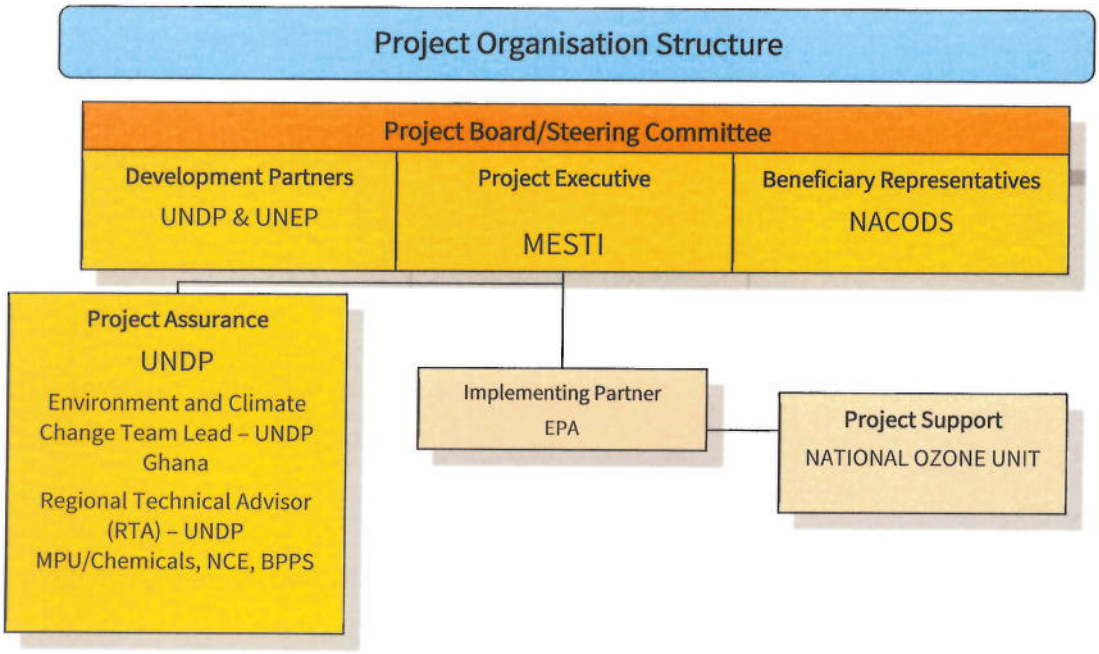
Quality Assurance	UNDP quality assurance process will be undertaken at the initiation, implementation and at project closure to ascertain project's efficiency, sustainability, and inclusiveness.	Initiation stage, implementation stage and project closure	Undertake Quality assurance using UNDP template	UNDP CO	None

Evaluation Plan

At the end of each Tranche in the implementation of the Stage II project, a tranche report shall be submitted to the Multilateral Fund highlighting activities undertaken in the reporting period, results and progress in resource utilisation. This will be complemented by an independent verification report conducted by an external person to ascertain the validity of results being reported to the Multilateral Fund.

At the end of the Stage II, an implementation report shall also be submitted to the Multilateral Fund, with an independent verification report.

VII. GOVERNANCE AND MANAGEMENT ARRANGEMENTS



Implementation and execution

The implementation modality for the project will be the National Implementation Modality in accordance with the UNDP guidelines and rules. The project will be executed by the Environmental Protection Agency (EPA) with technical guidance from UNDP CO/ Montreal Protocol Unit/Chemicals, UNEP and with overall oversight of Ghana MESTI.

The day-to-day administration of the project will be carried out by the National Ozone Unit Coordinator who will be technically supported by contracted national consultants and seconded EPA staff. Recruitment of specialist support services and procurement of any equipment and materials for the project will be done in accordance with relevant recruitment and procurement rules and procedures. The Project Assurance role will rest with the UNDP Country Office.

Following consultations on the project implementation, UNDP and the Government agreed that the UNDP country office will provide support services to the project at the request of the National Implementing Partner. These support services may include assistance with reporting requirements, procurement and direct payments. In providing such support services, the

UNDP country office shall ensure that the capacity of the Government-designated institution is strengthened.

The UNDP country office may provide, at the request of the designated institution, the following support services for the activities of the programme/project:

(a) Identification and/or recruitment of project and programme personnel;

(b) Identification and facilitation of training activities;

(c) Procurement of goods and services.

The procurement of goods and services and the recruitment of project personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures.

National Project Steering Committee

Overall guidance on project implementation will be provided by a National Committee on Ozone Depleting Substances (NACODS). The NACODS will; (a) review and approve work plans, (b) assess progress against M&E targets as indicated in the Project Results Framework, (c) review interim and final reports, (d) assess any gaps or weaknesses and make appropriate adaptive management decisions based on progress and achievements, (e) ensure that required resources are committed, and (f) arbitrate on any conflicts within the project and negotiate solutions to any problems with external bodies. PSC decisions should be made in accordance and in conformity with MLF and UNDP rules and procedures, and with standards that shall ensure best value in terms of money, fairness, integrity transparency and effective international competition.

The NACODS includes representation from Ministry of Environment, Science, Technology and Innovation, Environmental Protection Agency, Ministry of Finance, Ministry of Trade and Industry, United Nations Development Programme, Energy Commission, Department of Factories Inspectorate, Ghana Revenue Authority(CEPS), National Refrigeration and Air Conditioning Workshop Owners Association, the National Committee on Improved Refrigeration Practices, Council for Scientific & Industrial Research, Ghana Meteorological Agency, Friends of the Earth, and the Accra Technical Training Centre.

The NACODS meets at least twice a year to ensure that project is implemented as planned and also resolve any foreseeable challenges.

VIII. TOTAL BUDGET AND WORK PLAN (UNDP-SPECIFIC MLF FUNDING)

Outputs (Per MLF Approval)	MLF Approved Activities	Responsible Party	Fund ID	Donor Name	Atlas Account Code	Atlas Description	Budget (USD)	Budget notes
2. Focused awareness-raising/capacity-building of target groups	2.2 Purchasing of 13 refrigerant identifiers	UNDP	63030	MLF	72100	Contractual services - Companies	62,150	1
	2.3 Strengthening the capacity of NARWOA by conducting professional workshops/seminars to encourage its members to conduct good servicing practices	UNDP	63030	MLF	75700	Training and workshop	32,000	2
					71300	National Consultants	67,200	3
					71600	Travel	30,800	4
Total Output 2							$192,150	
3. Technicians in RAC sector trained for certification Programme	3.1 Provide support for four centres of excellence in the training of 1,400 technicians in good servicing practices and the safe handling of flammable refrigerants through the provision of equipment and tools	UNDP	63030	MLF	72100	Contractual services – Companies	80,000	5
					71300	National Consultant	10,000	6
					75700	Training and workshop	10,000	7
	3.2 Provide support for five universities by training trainers and providing equipment and tools to facilitate the inclusion in the curriculum of safe handling of flammable refrigerants and the training of 1500 technicians	UNDP	63030	MLF	72100	Contractual services – Companies	150,000	8
					75700	Training and workshop	30,000	9
					71300	National consultant	20,000	10
					71600	Travel	39,315	11
Total Output 3							$339,315	
4. Recovery Recycling and Recovery Programme	4.1 Providing equipment and tools to 50 workshops and training of 450technicians in refrigerant recovery and recycling, and retrofitting of HC refrigerants	UNDP	63030	MLF	72100	Contractual services - Companies	180,000	12
					75700	Training and workshop	15,000	13
					71600	Travel	19,500	14
					71300	National consultant	20,000	15
	4.2 Supporting the RAAG to participate in international meetings, subscribing to technical literature and organizing national workshops and seminars.	UNDP	63030	MLF	75700	Training and workshop	50,000	16
	4.3 Establishing two refrigerant reclamation centres	UNDP	63030	MLF	72100	Contractual services - Companies	140,000	17
Total Output 4							$420,500	
5. The adoption of R-290 technology and environmentally sound alternative	5.1 Demonstrate R-290 AC technology by replacing 71 units of HCFC-22 AC with R-290-based ACs in a hostel, communicating and	UNDP	63030	MLF	72100	Contractual services - Companies	60,000	18

technologies effectively facilitated	disseminating the results and raising awareness on r-290 technology							
Total Output 5							$60,000	
6. Project management, monitoring and reporting	6.1 Project management, monitoring and reporting	UNDP	63030	MLF	71200	International Consultant	20,000	19
					71300	National Consultant	70,000	20
					71600	Travel	40,000	21
					74500	Miscellaneous	18,005	22
Total Output 6							$148,005	
GRAND TOTAL							1,159,970	

BUDGET NOTES

No	Description
1	Cost for firm to supply 13 refrigerant identifiers for customs division. Estimated @ $4,781 per identifier
2	Cost for meeting and training workshops for NARWOA capacity building activities. Estimated 8 trainings @ 4,000 each
3	Four-year salary for national consultant. Estimated at $16,800 per year.
4	Travel cost for 8 NARWOA capacity building activities. Estimated at $3,850 per travel
5	Costs for procurement of tools and equipment for 4 centres of excellence. Estimated @ $20,000 per centre
6	Support cost for National consultant salary
7	10 Training at centres of excellence @1,000 per training to cater for refreshment.
8	Procurement of tools and equipment for 5 universities @ $30,000 per university
9	10 Training and workshops with 5 universities @ 3,000 per workshop
10	Support cost for National consultant salary
11	Travel cost for 10 workshops with universities @ $3,931.5 per workshop
12	Procurement of equipment and tools for 50 refrigeration technicians workshops @ 3,600 per workshop
13	5 trainings for technicians @ 3,000 per training to cater for venue and refreshments
14	Travel cost for n5 trainings @ 3,900 per training
15	Support cost for National consultant salary
16	Support for 10 RAAG workshops/conferences/seminars at @$5,000 per workshop
17	Cost for construction and equipping of 2 reclamation centres @70,000 per centre
18	Cost for procurement and installation of at least 45 AC units @$1,222 per unit and $5,000 for media communication activities
19	International consultant to support project proposal development and reporting @ $600* 33 days

20	$50,800 to support national consultant salary for 3 years ($16,800 per year), and cost of national consultant to develop verification reports @$300 * 64 days
21	Travel cost for NOU nationwide monitoring at $4,000 per year for 10 years.
22	Support for operational costs and expenses in NOU, UNDP DPC, as applicable.

TRANCHE AMOUNTS AND DATES

Particulars	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Lead IA (UNDP) agreed funding (US $)	459,820	0	0	236,545	0	0	350,580	0	0	113,025	1,159,970
Support costs for Lead IA (US$)	32,187	0	0	16,558	0	0	24,541	0	0	7,912	81,198
Cooperating IA (UNEP) agreed funding (US $)	112,569	0	0	160,569	0	0	135,569	0	0	50,000	458,707
Support costs for Cooperating IA (US$)	14,634	0	0	20,874	0	0	17,624	0	0	6,500	59,632
Total agreed funding (US$)	572,389	0	0	397,114	0	0	486,149	0	0	163,025	1,618,677
Total support costs (US$)	46,821	0	0	37,432	0	0	42,165	0	0	14,412	140,830
Total agreed costs (US $)	619,210	0	0	434,546	0	0	528,314	0	0	177,437	1,759,507

** *Adapted from of Appendix 2-A of MLF ExCo approval document in Annex 3*

IX. RISK MANAGEMENT

IDENTIFIED RISKS	RISK ASSESSMENT	MITIGATION MEASURES
Financial: Inadequate funds to ensure continuity of initiated actions	Low	Full funding has been approved by the Multilateral Fund for the entire duration of the Stage II. The project team and executing agencies shall efficiently implement and report on project plans to secure consistent tranche funding. The Government of Ghana as part of its commitment to the Protocol would also be relied on to provide financial support for the implementation of project's activities.
Organizational: Lack of collaboration and participation from the relevant stakeholders	Medium	The National Ozone Unit will ensure that effective communication is established among relevant stakeholders. The NOU Coordinator will ensure that tasks and responsibilities of stakeholders are clearly established and will also ensure that those tasks are achieved in time. Stakeholder involvement will be prioritized at all stages to enhance participation and ownership.
Operational: Delay in the execution of activities due to lengthy governmental procedures.	Medium	Proper project planning will be ensured Project Management team and the Steering Committee as per the Annual Work plan. Monitoring of project's progress will be done through the quarterly progress reports. Assistance with be provided by UNDP in the execution of certain activities when need arises.
Operational: Inability to organize physical meetings and/or travels due to public health restrictions	High	Facilities have been acquired by EPA to enhance online workshops and meetings. Where possible, trainings and meetings shall be organized online. Additionally, the EPA shall work in close coordination with Government of Ghana health institutions, and UN Country Covid-19 management team to explore strategies of implementing travel and meeting activities in a safe manner.
Operational: Delays in procurement due to impact of covid-19/other public health risks on global market operations	Medium	Procurement plans will be developed and implemented in time to avoid delays. Additionally, global networks of UNDP and UNEP experienced with the supply of relevant tools and equipment's to be procured through project shall be engaged and invited to respond to procurement openings.

X. LEGAL CONTEXT

Country has signed the Standard Basic Assistance Agreement (SBAA)

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA and all CPAP provisions apply to this document. Consistent with the Article III of the Standard Basic Assistance Agreement, 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.

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.

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 this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the 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). This provision must be included in all sub-contracts or sub-agreements entered under this Project Document.

XI. ANNEXES

- **Annex 1: Combined Results Framework (UNDP and UNEP)**

Sustainable Development Goal (s): SDG Goal 12: Responsible Consumption and Production					**UNDP Strategic Plan Indicator:**
Outcome included in the UNSDP: Outcome 5: Environmental governance at national and local levels is effective, efficient and coherent					
Project outputs	**Indicators**	**Baseline (2020)**	**Target (2030)**	**Means of Verification**	**Assumptions**
1. Regulatory environment established	Number of policy and regulations established on HC refrigerants.	0	1	Publication on policy enactment; Policy document	All relevant stakeholders shall have the capacity and resources to develop relevant policies.
	Number of operational guidelines developed on the use of HC refrigerants	1	2	HC guideline document	All relevant stakeholders shall have the capacity and resources to develop relevant guidelines.
2. Target Groups sensitized and trained through awareness-raising /Capacity building	Number of trainers trained	3	23	Training report	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of customs officers trained on ODS import control and the prevention of illegal trade	606	1,206	Training report	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of refrigerant identifiers procured for Customs Division	6	19	Procurement PO, Asset transfer document	The EPA/UNDP CO has capacity to conduct procurement in time.

	Number of workshops/seminars to strengthen the capacity of NARWOA	0	10	Training reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of awareness-raising and training activities undertaken on alternative technologies to HCFC, low-GWP cooling systems and maintaining /improving the energy efficiency of RAC systems	0	20	Meeting reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of awareness creation activities on alternative technologies undertaken for importers, distributors and retailers of controlled substance and equipment	0	10	Meeting reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
3. Technicians in RAC sector trained for certification Programme	Number of technicians trained through four centres of excellence in good servicing practices and the safe handling of flammable refrigerants through the provision of equipment and tools.	778	2,178	Training reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Minimum number of female technicians trained	5	155	Training reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of trainings conducted in centres of excellence for technicians	0	10	Training reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of universities supported through ToT, and the provision of equipment and tools to facilitate the inclusion safe handling of flammable refrigerants in their curriculum.	0	5	Training reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.

	Number of technicians trained through curriculum developed with universities	0	1,500	Meeting reports, updated curriculum	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of workshops conducted for universities	0	10	Meeting reports	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number of certification programmes established for RAC technicians	0	1	Approved certification Programme document; publication on certification Programme	The EPA, Energy Commission and relevant stakeholders have capacity to develop and implement certification programme with a national reach
	Number of RAC technicians certified through certification programme	0	TBD	Certification roster	The EPA, Energy Commission and relevant stakeholders have capacity to develop and implement certification programme with a national reach
4. Recovery Recycling and Recovery Programme	Number of workshops supported with equipment and tools to 50 workshops	11	61	Procurement PO, Asset transfer document	The EPA/UNDP CO has capacity to conduct procurement in time.
	Number of technicians trained in refrigerant recovery and recycling, and retrofitting of HC refrigerants	0	450	Training report	The EPA and relevant partners shall have capacity and no public health restrictions to undertake physical trainings.
	Number workshops (national/international) RAAG has been supported to organize/ participate	0	10	Meeting report	The EPA, RAAG and relevant partners shall have capacity and no public health

					restrictions to undertake physical trainings.
	Number of refrigerant reclamation centres established	0	2	Certification on works completion, media report	The EPA/UNDP CO has capacity to conduct procurement in time.
5. The adoption of R-290 technology and environmentally sound alternative technologies effectively facilitated	Units of HCFC-22 ACs replaced with R-290-based ACs to demonstrate its efficiency	0	71	Completion of installation certificate	The EPA/UNDP CO has capacity to conduct procurement in time; There are in-country service providers with capacity to conduct installation and monitoring
	Number of awareness creation activities undertaken on demonstration exercise	0	3	Media report (1 radio, 1 social media documentary, 1 TV interview)	EPA and UNDP CO have capacity to engage media efficiently on information dissemination

- Annex 2: Combined budget (UNDP and UNEP)

Outputs	MLF Approved Activities	Responsible Party	Fund ID	Donor Name	Atlas Account Code	Atlas Description	Budget (USD)
1. Regulatory environment established	1.1 Establish policy and regulations, updating safety guidelines for the use of HC refrigerants	UNEP	N/A	MLF	N/A	TBD by UNEP	25,000
Total Output 1							$25,000
2. Target Groups sensitized and trained through awareness-raising /Capacity building	2.1 Training of 20 trainers and 600 customs officers in ODS import control and the prevention of illegal trade	UNEP	N/A	MLF	N/A	TBD by UNEP	75,000
	2.2 Purchasing of 13 refrigerant identifiers	UNDP	63030	MLF	72100	Contractual services - Companies	62,150
	2.3 Strengthening the capacity of NARWOA by conducting professional workshops/seminars to encourage its members to conduct good servicing practices	UNEP	N/A	MLF	N/A	TBD by UNEP	20,000
		UNDP	63030	MLF	75700	Training and workshop	40,000
					71300	National Consultants	60,000
					71600	Travel	30,000
	2.4 Awareness raising and training activities on alternative technologies to HCFC, low-GWP cooling systems and maintaining /improving the energy efficiency of RAC systems	UNEP	N/A	MLF	N/A	TBD by UNEP	100,000
	2.5 Awareness creation and information dissemination on alternative technologies for importers, distributors and retailers of controlled substance and equipment	UNEP	N/A	MLF	N/A	TBD by UNEP	90,000
Total Output 2							$477,150
3. Technicians in RAC sector trained for certification Programme	3.1 Provide support for four centres of excellence in the training of 1,400 technicians in good servicing practices and the safe handling of flammable	UNDP	63030	MLF	72100	Contractual services – Companies	80,000
					71300	National Consultant	10,000

	refrigerants through the provision of equipment and tools				75700	Training and workshop	10,000
	3.2 Provide support for five universities by training trainers and providing equipment and tools to facilitate the inclusion in the curriculum of safe handling of flammable refrigerants and the training of 1500 technicians	UNDP	63030	MLF	72100	Contractual services – Companies	150,000
					75700	Training and workshop	30,000
					71300	National Consultant	20,000
					71600	Travel	39,315
	3.3 Implementing the certification of RAC technicians	UNEP	N/A	MLF	N/A	TBD by UNEP	58,707
Total Output 3							**$398,022**
4. Recovery Recycling and Recovery Programme	4.1 Providing equipment and tools to 50 workshops and training of 450technicians in refrigerant recovery and recycling, and retrofitting of HC refrigerants	UNDP	63030	MLF	72100	Contractual services - Companies	180,000
					75700	Training and workshop	15,000
					71600	Travel	19,500
					71300	National Consultant	20,000
		UNEP	N/A	MLF	N/A	TBD by UNEP	50,000
	4.2 Supporting the RAAG to participate in international meetings, subscribing to technical literature and organizing national workshops and seminars.	UNDP	63030	MLF	75700	Training and workshop	50,000
		UNEP	N/A	MLF	N/A	TBD by UNEP	10,000
	4.3 Establishing two refrigerant reclamation centres	UNDP	63030	MLF	72100	Contractual services - Companies	140,000
Total Output 4							**$480,500**
5. The adoption of R-290 technology and environmentally sound alternative technologies effectively facilitated	5.1 Demonstrate R-290 AC technology by replacing 71 units of HCFC-22 AC with R-290-based ACs in a hostel, communicating and disseminating the results and raising awareness on r-290 technology	UNDP	63030	MLF	72100	Contractual services - Companies	60,000
		UNEP	N/A	MLF	N/A	TBD by UNEP	30,000
Total Output 5							**$90,000**
6. Project management,	6.1 Project management, monitoring and reporting	UNDP	63030	MLF	71200	International Consultant	20,000
					71300	National Consultant	70,000
					71600	Travel	40,000

monitoring and reporting					74500	Miscellaneous	18,005
Total Output 6							$148,005
GRAND TOTAL							$1,618,677

- Annex 3: MLF approval document
- Annex 4: Project Quality Assurance Report
- Annex 5: UNDP Social and Environmental Screening Procedure report
- Annex 6: LPAC minutes