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# UNDP Project Document

**UNDP-MLF**

Government of Nigeria

United Nations Development Programme

**Hydrochlorofluorocarbon Phaseout Management Plan (HPMP) for Nigeria**

The HPMP will result in the complete phase out of 407.7 ODP tonnes of HCFCs in Nigeria by 1st January 2040 in line with the obligation taken by the Government of Nigeria under the Montreal Protocol on Substances that Deplete the Ozone Layer. This will ensure the sustainable and cost-effective phase-out of HCFCs through implementation of a combination of interrelated institutional and regulatory measures and other investment activities including conversion of production facilities and strengthening of national capacities for local manufacture of hydrocarbon based alternative refrigerants.

The HPMP is proposed in several stages. The first stage includes actions for the completion of the 2013 consumption freeze and 2015 - 10% reduction targets. The required actions for the subsequent Stage(s) will be prepared in 2014 and presented in 2015. Nigeria has obtained financial support from the Multilateral Fund to cover implementation of Stage 1 of the HPMP which will result in the phase out, by 1 January 2015, of 90.1 ODP tonnes of HCFCs, equivalent to 22% of Nigeria’s agreed baseline HCFC consumption. The approved funds will be allocated to Nigeria over a five-year period.

The total funding of the HPMP amounts to US$ 4.9 million, funded by the Multilateral Fund for the Implementation of the Montreal Protocol. The programme is a performance-based agreement, which means that the country needs to achieve well-defined yearly HCFC consumption reduction targets in order to obtain each subsequent yearly funding-tranche.

Out of this amount, UNDP - which is the lead implementing agency - was given US$ 2.9 million which will be approved and allotted to the country on an annual basis. However, UNDP’s first funding tranche of stage 1 of the HPMP, which was already approved by the ExCom amounts to **US $855,603**.

**Executing Agency:** Federal Ministry of Environment, National Ozone Office (NOO)

**Starting date**: 1 March 2011

Detailed information on this programme can be found in the HPMP-document that was approved by the ExCom and which covers all funding tranches of Stage 1. This UNDP Delegation of Authority (DOA) is being kept short as it refers to the HPMP-document which is attached herewith.

**Project of the Government of Nigeria**

**Hydrochlorofluorocarbon Phaseout Management Plan (HPMP) for Nigeria**

**PART I: Background.**

**Situational analysis**

Nigeria is a party to both the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer. These were both ratified on 31st October 1988, and came into force on 1st January 1989. Nigeria also ratified the London, Copenhagen and Montreal Amendments to the Protocol on 23rd July 2001 and the Beijing Amendment on 26th February 2004.

The Federal Ministry of Environment is the statutory institution responsible for the management of hazardous chemicals in Nigeria and it derives its authority, among others, from the Federal Environmental Protection Agency (FEPA) Act. The Act 58 of 30 December 1988 established the Federal Environmental Protection Agency (FEPA), now subsumed by the Federal Ministry of Environment (FMENV), as the chief regulatory body for environmental protection in Nigeria.

In addition, the basic legislations that the federal government relies upon are amongst many others:

1. National Environmental Standards and Regulations Enforcement Agency Act (NESREA).
2. National Oil Spill Detection and response Agency Act (NOSDRA)
3. National Agency for Food and Drugs Administration and Control Act (NAFDAC).
4. Standards Organization of Nigeria Act (SON).
5. Consumer Protection Council of Nigeria Act.
6. Nigerian Customs Services Management Act.

The most commonly used HCFCs in Nigeria are HCFC- 141b in the foam sector, both HCFC-22 and 141b and refrigeration and commercial manufacturing sectors, and HCFC-22 exclusively in the air conditioning and in the refrigeration servicing sectors. More background information can be found in Chapter 1 of the HPMP. Consumption by substance and sector is detailed in the HPMP document under Chapter 2.

**Description of the Project Preparation Phase and Establishment of Priorities**

This document was prepared based on the overall HCFC Phaseout Management Plan document which was approved for Nigeria at the 62nd meeting of the Executive Committee. The HPMP contains information on activities that were approved for UNDP and UNIDO and describes the activities for the stage 1 of the HPMP covering the implementation-period 2011-2015. However, the present DOA-document is prepared covering only the activities for UNDP, and will mostly focus on the activities that were already funded in late-2010. As such, this document can be kept short as it refers to the approved and comprehensive HPMP document which is attached herewith.

It should be noted that the HPMP has been established after a thorough process during a project preparation stage, in which a team of national consultants conducted in-depth and country-wide surveys to identify consumers of HCFC in Nigeria. Both an inception workshop at the beginning of the project preparation phase and a stakeholder workshop towards the end of the same were held, during which the major stakeholders have determined the strategic lines and priorities that the country would need to follow to ensure a proper phase-down of the consumption of HCFCs. All relevant private sector enterprises were invited to those venues via extensive advertisement through the media. Activities that were to be funded first were thus identified at that early stage, including which of the recipient enterprises should receive this assistance on a priority basis to allow Nigeria to stay in compliance with the consumption targets of the Montreal Protocol. This was then endorsed by the Government of Nigeria, and then submitted and approved by the Executive Committee. The latter however also has specific guidelines on what sectors/enterprises should be funded first, for example a higher priority is given to HCFC-141b in view of this chemical’s higher ODP (potential to destroy the ozone layer) as compared to HCFC-22. Having said this, further funding will eventually allow the Government to address all HCFC consumers in Nigeria in the private sector. Further details on the process that was used to arrive at the specific activities contained in this project is annexed to this document (annex A).

**PART II: Management Arrangements**

The HPMP will be managed, under the NEX modality (Nationally Execution), by the Government of Nigeria and the Federal Ministry of Environment has the overall responsibility for the implementation of the Montreal Protocol in Nigeria. Particular elements of this project like recruitment of staff, can be done by the UNDP CO as “Country Office support to NEX” if and when so requested officially by the national implementing agency. Also, the contracts for the “international consultant” will be centrally managed by UNDP in New York (Dept ID “B0084”in ATLAS) which will save on airfare as missions to several countries can be combined. Within the Ministry is established the National Ozone Office (NOO) with the responsibility for coordinating the activities for the implementation of the Protocol. The Coordinator of the NOO will be responsible for day-to-day management of the activities of the HPMP with assistance from the National Ozone Team and/or relevant national consultants.

A National Ozone Advisory Committee (NAOCOM) to assist the NOO` in carrying out the mandate of meeting the country’s obligations under the Protocol has also been established within the Ministry. The Committee is chaired by the Minister of the Environment.

In accordance with standard UNDP procedures, all resources/equipment gained through project support remains the property of UNDP until project closure when a decision will be taken as to how to dispose of these resources. It is standard practice to leave such resources after project closure as a contribution to the development of national capacity.

Given that the HPMP and its components are performance-based -- please refer to the Agreement between the Executive Committee of the Multilateral Fund of the Montreal Protocol and the Government of Nigeria (ExCom Agreement) in annex 1 of the HPMP document -- the overall implementation of the HPMP including its components and sub-components will be carried out through performance-based agreements between the country and respective stakeholders. It is for this reason, that performance-based “Memoranda of Agreements” (MOAs) will be established between the Government and the Recipient Enterprises. This has been practiced in various countries already with success, and UNDP Country Offices have readily accepted this modality.

MOAs are suited for individual activities to be carried out for subproject within the overall performance-based agreement which are technically complex, such as individual phase-out investment projects. The MOA is between the government and a stakeholder (e.g. an enterprise participating in a sector/national plan). The terms of ExCom approval of such an activity are replicated in the MOA between the government and that stakeholder, in form of milestones/deliverables and clear indicators. The stakeholder is paid by the local UNDP-office upon achieving such deliverables. Both government and UNDP do the diligence for verifying the indicators. So for instance UNDP would not need to procure foam machines – that would be done by the recipient (or stakeholder). Instead government and UNDP would only verify and confirm that the enterprise has acquired whatever is needed to implement the conversion using the agreed indicators.

Please see the attached sample MOA in annex B that was approved for a Bangladesh foam project. It includes the due diligence that will take place to pay the benchmarks (see very end of annex B below). Once cleared by NOO and UNDP-Abuja, UNDP-Abuja will make the payments.

During the first year of the HPMP and as described in part III above (Activity 1 and 2), MOAs would be established for three subactivities:

* two system houses Vitafoam and Komaj
* the Pamaque HC production demonstration project

Detailed description on the selection of these enterprises during the project preparation phase of the HPMP can be found in part III and in annex A below.

It is proposed that the three MOAs be prepared during the first 3-4 months after the signature of the project document.

**PART III: HPMP Overall Strategy**

As mentioned before, the HPMP is proposed in several stages. The first stage includes actions for the completion of the 2013 freeze and 2015 - 10% reduction targets. The required actions for the subsequent stage(s) will be prepared in 2014 and presented in 2015.

Four strategic lines have been defined, from which concrete actions for the reduction and elimination of HCFCs are developed. These lines will be developed over one or more stages of the HPMP.

* The first strategic line of the HPMP is associated with the conversion of companies in the polyurethane foam sector. For more information, please refer to the HPMP paragraph 3.2 and annex 4.1.
* The second strategic line of the HPMP is associated with the conversion of companies in the Commercial Refrigeration and AC Manufacturing Sector (RACM). For more information, please refer to the HPMP paragraph 3.2 and annex 4.2.
* The third strategic line of the HPMP is associated with the Refrigeration and Air Conditioning Servicing Sector (RACS). For more information, please refer to the HPMP paragraph 3.2 and annex 4.3 and annex 4.4.
* Finally, a programme is proposed for project coordination, management activities. For more information, please refer to the HPMP paragraph 3.2 and annex 4.5.

Many of the programmes that were hoped for in the originally submitted HPMP had to be deferred or canceled, as funding granted to Nigeria had to be limited according to the decision at the Executive Committee. This is clearly indicated in the HPMP-document.

The approved HPMP document together with Annex I (Agreement between Nigeria and the Executive Committee) and appendices to the document are attached to the present document, which is why the details are not repeated here. However, in order to provide an overview of all activities that were approved for UNDP and UNIDO, the budget is repeated here:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Line of Action** | **Components of Activity** | **Agency** | **Project Cost US$** | **Subtotals** | **2010\*** | **2011** | **2012** | **2013** | **2014** |
| 1. Foam Sector Programme (excluding enterprises using HCFC 22 which belong to next programme) | a) Supply of foam systems Upgrade of 2 local systems facilities for supply of fully formulated systems with methyl formate and/or methylal for RPF applications | UNDP | 1,950,750 | 1,950,750 | 247,603 | 503,515 | 467,829 | 467,829 | 263,974 |
| b) 2 group projects in thermoware and misc. applications | UNDP | merged |  |  |  |  |  |  |
| c) Individual project for automotive integral skin foam | UNDP | merged |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| 2. Refrigeration and AC Manufacturing Programme (RACM) | a) Subsector plan commercial refr. equipment manufacturing | UNIDO | 1,759,080 | 1,759,080 | 505,000 | 505,000 | 600,172 |  | 148,908 |
| b) Subsector plan to phase out R-22 in the AC sub-sector | UNIDO | deferred |  |  | - |  |  |  |
| c) Subsector plan to phase out R-22 in the commercial refrigeration | UNIDO | deferred |  |  |  |  |  |  |
| 3. Refrigeration and AC Servicing Programme (RACS) | 1. Individual Project for HC Production (Pamaque) | UNDP | 869,000 | 869,000 | 572,000 | 297,000 |  |  |  |
|  |  |  |  |  |  |  |  |  |
| 2. Regulations: Control system for products with HCFCs | UNDP | deferred |  |  |  |  |  |  |
| 3. Regulations: Control system for trade, use of HCFCs | UNDP | deferred |  |  |  |  |  |  |
| 4. Servicing: Training in Good Practices in Refrigeration. | UNDP | deferred |  |  |  |  |  |  |
| 5. Servicing: Sector training, including demonstrations. | UNDP | deferred |  |  |  |  |  |  |
| 6. Servicing: Incentives for Cold Rooms in Agro Industry. | UNDP | deferred |  |  |  |  |  |  |
| 7. Servicing: Regeneration & canisterization project | UNDP | deferred |  |  |  |  |  |  |
| 8. Sensitization:Sensitization campaigns | UNDP | deferred |  |  |  |  |  |  |
| 4. Project Coordination, Management and Sensitization Programme | 1. Personnel | UNIDO | 140,000 | 360,000 | 35,000 | 35,000 | 35,000 |  | 35,000 |
| 2. National Consultants | UNDP | 65,200 |  | 13,040 | 13,040 | 13,040 | 13,040 | 13,040 |
| 3. International Consultants | UNDP | 50,000 |  | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| 3. International Consultants | UNIDO | 40,000 |  | 10,000 | 10,000 | 10,000 |  | 10,000 |
| 4. Equipment | UNDP | 12,500 |  | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 |
| 5. Travel | UNDP | 41,500 |  | 8,300 | 8,300 | 8,300 | 8,300 | 8,300 |
| 6. Communications & Miscellaneous | UNDP | 10,800 |  | 2,160 | 2,160 | 2,160 | 2,160 | 2,160 |
|  |  |  | 4,938,830 | 4,938,830 | 1,405,603 | 1,386,515 | 1,149,001 | 503,829 | 493,882 |
|  |  |  |  |  |  |  |  |  |  |
|  | Without Support Costs | UNDP | 2,999,750 |  | 855,603 | 836,515 | 503,829 | 503,829 | 299,974 |
|  |  | UNIDO | 1,939,080 |  | 550,000 | 550,000 | 645,172 | - | 193,908 |
|  |  | TOTAL | 4,938,830 |  | 1,405,603 | 1,386,515 | 1,149,001 | 503,829 | 493,882 |
|  |  |  |  |  |  |  |  |  |  |

Note\*: Moneys received in November/December of a given year will be implemented in the next year.

**PART IV: UNDP’s Implementation of Stage 1 Year 1 of the Nigeria HPMP (2011)**

The following paragraphs provide information about the strategic lines to be implemented by UNDP under the **first funding-tranche of Stage 1 (moneys received in 2010 to be implemented in 2011)**. As shown in the HPMP, new funding tranches will be obtained on a yearly basis as can be seen in a summarized way from the budget of the HPMP on page 43 of that document.

* ACTIVITY 1: Programme for the conversion of companies in the polyurethane foam sector (see annex 4.1 of the HPMP). The programme for the first tranche of Stage 1 would amount to US$ 247,603 and contains the following component:
  + Supply of foam systems ‑ Upgrade of two local systems facilities for supply of fully formulated systems with methyl formate and/or methylal for rigid polyurethane foam (RPF) applications in Nigeria, including trial production and training
* ACTIVITY 2: Refrigeration and Air Conditioning Servicing Sector (RACS) Programme (see annex 4.3 of the HPMP). The programme for the first tranche of Stage 1 would amount to US$ 572,000 and contains the following component:
  + Individual demonstration project to put a production facility into place to locally produce refrigerant-grade hydrocarbons
* ACTIVITY 3: Project coordination, management activities encompass all stages of the HPMP (see Annex 4.5 of the HPMP). During stage 1, the budget is approved at US$ 36,000.

A more detailed description of these activities with costing follows. However it should be noted that the proposed implementation modality consists of performance-based Memoranda of Understanding (MOA) as explained in Part V below.

**ACTIVITY 1: Foam Sector Programme**

A detailed description of this programme can be found in annex 4.1 of the HPMP. The first funding tranche as approved by the Executive Committee is limited to the following activities:

**Upgrade of System Houses at Vitafoam and Komaj for Supply of Methyl Formate-Based Systems to the Nigerian Foam Industry**

The Nigerian manufacturing companies that manufacture foam products using HCFC-141b or manufacture products that depend on the use of HCFC-141b are mainly small and medium scale enterprises. The overall average consumption of the enterprises was estimated to be 7.0 tonnes in 2009. There were 25 manufacturers of non-appliance foam products such as sandwich panels, spray foam and thermoware products. In addition there are 140 manufacturers of ice making machines that used an average of 4.8 tonnes of HCFC-141b in 2009. (See HPMP to see the list of such enterprises). Thus, the phase-out of HCFC-141b by companies that manufacture foams—regardless if they belong to the foam or the refrigeration sector—poses a major challenge in terms of the selection of appropriate alternative technologies. As detailed in the HPMP, the most suitable and cost-effective alternative blowing agent appears to be methyl formate. Currently this blowing agent is not available in Nigeria. Information available to the Government indicates that the most convenient safe and cost effective way of ensuring reliable supply of the blowing agent to the foam industry is through the service of a local system house or houses as pre-blended system (in polyol or MDI). Therefore two companies with the capacity to operate systems house facilities have been identified for support to operate systems house capable of meeting the requirement for the systems. It is estimated that over 1,000 tonnes of the blowing agent in the systems may be required by the sector in future. It is proposed to get these two systems houses operational at the Vitafoam and Komaj companies by early 2012 to enable the foam companies selected for the first stage implementation programme to complete their projects on schedule. Table 3.4.1 below shows the estimated cost of the proposed upgrade per facility. However these items are only provided for costing-purposes only as they will be integrated into an MOA with specific benchmarks (except for 2/3 of the Technology Transfer & Trials line) 🡪 see part VI of this document.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table 3.4.1: Upgrade of System House at Vitafoam and Komaj for Supply of Methyl Formate-Based Foam Systems** | | | | |
|  | **Item** | **Costing in (US $) per enterprise** | **Comments** | **Remark** |
| 1 | Retrofit of blender | 40,000 |  | Part of MOA |
| 2 | Nitrogen generator | 10,000 | Agramko race-tyrefiller | Part of MOA |
| 3 | Laboratory Equipment | 25,000 | Picnometer, refraction index meter, k value tester | Part of MOA |
| 4 | Support to Customers | 24,000 | US$ 2,000/application; 12 applications | Part of MOA |
| 5 | Technology transfer, trials, training | 30,000 |  | 1/3 of amount is part of MOA |
| 6 | Contingencies | 12,400 |  | Part of MOA |
|  | **Total** | **141,400** |  |  |

In view of the novelty of the methyl formate technology and possible special requirements related to its use it is found desirable to organize training workshops for all prospective users to provide opportunity for the technology suppliers to provide adequate information to and education of the manufacturers on all salient issues relating to the use of the technology. Such process of initiation into the technology could ensure safe use of the technology and its seamless transfer. The cost of this training activity is estimated to be US $50,000.

The total of this activity comes to two times US$ 141,400 plus US$ 50,000 or US$ 332,800. While this activity has been approved in full by the Executive Committee meeting, only US$ 247,603 has been made available during the first funding tranche while the balance would be part of the second funding tranche.

The budget for this first instalment will be as follows:

|  |  |  |
| --- | --- | --- |
| **Account** | **Budget Description** | **Amount 2011 (USD)** |
| 71200 | International Foam Consultants | 20,000 |
| 71300 | National Consultant Foam | 20,000 |
| 72100 | MOA\* with System House 1 | 103,802 |
| 72100 | MOA\* with System House 2 | 103,802 |
|  |  | **247,604** |

**\*: Memorandum of Understanding between Govt and Enterprise, please see part VI below.**

When the second funding tranche will be approved the balance of US$ 85,196 for this subproject will be distributed in a similar fashion.

**ACTIVITY 2: Refrigeration and Air Conditioning Servicing Sector (RACS) Programme.**

A detailed description of this programme can be found in annex 4.3 of the HPMP. The first funding tranche as approved by the Executive Committee is limited to the following activities:

**RACS and Pamaque Hydrocarbon Production Demonstration Project.**

The informal servicing sector for refrigerators and air conditioning in Nigeria is using in rapidly increasing amounts hydrocarbons as replacement for HCFC-22 and HCFC blends. The feedstock is imported and no safety measures to cope with flammability and explosion hazard are observed. At the initiative of the FME/NOO, an innovative prototype distillation unit for locally available LPG was designed that can produce up to 200 t of natural refrigerants (C3 thru C4) per year. This will be offered in the market along with a training program for service technicians to assure safe use. If the program proves viable, it can be the base of a commercial scale production unit that will support phase-out of the use of HCFCs in RAC manufacturing and related service operations.

This subproject is designed to build the demonstration distillation unit and bottling unit, to conduct related quality testing and to market the product to a select group of service providers that commit to a training and certification program on good practices in the use of HC refrigerants (R-290, R-600a and R-600) and are prepared to function as trainers if/when the program is expanded at a later date. If the initiative proves successful, the actual commercial plant will be built through private initiative. Such a production facility will be able to serve not only Nigeria, as well as in much of the Sub-Saharan region with non-ODS/low GWP, high purity refrigerants that can replace current use of HCFCs. Such products are generally not available in this region but need to be imported from Europe or the Middle-East.

This demonstration project is designed around Pamaque Nigeria Ltd. Pamaque Nig Ltd is a fully indigenous engineering company. The company has developed several technological solutions to the various facets of ODS phase-out in Nigeria, such as:

* Design and manufacture of a portable refrigerant recovery unit. This machine has been used in MLF-sponsored R&R programs
* Design and manufacture of a refrigerant recovery and recycling unit
* Design and manufacture of a semi-automatic box-foam unit, approved by UNDP for use in their foam sector phase-out program
* Design and manufacture of local content (tanks, exhaust, installation) for equipment purchased under the mentioned UNDP program

Pamaque was the only participant who responded to the various announcements and calls that were made during the project preparation stage and who expressed interest in cooperating in this type of a project. It also announced that it would invest approximately US$ 1.2 million of its own funds in this project as is mentioned in the HPMP document paragraph 3.6 (co-financing). These are some of the reasons for which the Government agreed to include the Pamaque-component into the over-arching strategy of Nigeria’s HPMP and for which the Executive Committee agreed to allocate a substantive amount of funds to this subproject.

The project will be implemented using the first two funding tranches of the HPMP:

**Tranche 1**

* Building of a pilot plant at an existing side to validate the proposed process to built a commercial scale multi-pass fractional distillation batch process for locally supplied LPG to produce components for natural, hydrocarbon based refrigerants in the C3 thru C4 range (propane or R290; butane or R-600; iso-butane or R-600a). The work will consist of
* Preparatory work (permits, drawings, etc);
* Buildings and infrastructure;
* Distillation equipment manufacture and installation;
* Start-up and product quality testing
* Design and prototyping of low-cost retrofit units to facilitate conversions from HCFCs to hydrocarbons in refrigeration manufacturing and servicing operations.
* Testing of the new refrigerants in selected refrigeration manufacturing and service applications

**Tranche 2**

As mentioned, there is a lot of informal use of hydrocarbons in the servicing market. Very popular is the use of “cooking gas”, a crude blend of hydrocarbons dominated by propane. During repair, the gas—if any left—is vented, the unit repaired and without any modification or precautions against explosion, cooking gas is charged directly from the bottle. The low price of the product, combined with its abundance, makes this a proliferating praxis that will be difficult to suppress. While under the slogan “if you can’t fight them, join them” low cost purified refrigerant will be made available under Tranche-I of this project—improving the performance of the equipment—Tranche-II intends to introduce best practices in

* Avoidance of venting
* Retrofit to allow safe operation on hydrocarbons
* Proper tooling
* Training in safe practices

The activities have been costed as follows. However these items are only provided for costing-purposes only as they will be integrated into an MOA with specific benchmarks (except for the Technology Transfer & Trials line) 🡪 see part VI of this document.

|  |  |  |  |
| --- | --- | --- | --- |
| # | Tranche 1 (for costing purposes only, MOA to be established) | COSTING (US$) | |
| Detail | Total |
| 1 | Project preparation (selection of downstream participants, designs, permits | 20,000 | 20,000 |
| 2 | Construction of a Pilot HC refrigerant pilot facility - Excavation  - Infrastructure  - Structures  - Equipment | 10,000  30,000  60,000  300,000 | 400,000 |
| 3 | Trials, testing, certification | 20,000 | 20,000 |
| 4 | Field testing - Manufacturing  - Servicing | 15,000  15,000 | 30,000 |
| 5 | Design//testing/certification of conversion kits - Manufacturing  - Servicing | 10,000  10,000 | 20,000 |
| 6 | Technical support, supervision, monitoring | 30,000 | 30,000 |
| 7 | Contingencies (10% of sub-total) |  | 52,000 |
| Total Tranche-I | | | 572,000 |

|  |  |  |  |
| --- | --- | --- | --- |
| # | Tranche 1 (for costing purposes only, MOA to be established) | COSTING (US$) | |
| Detail | Total |
| 1 | Project Management - National Expert (4 months@ 2,500)  - Set-up/maintenance of a web page  -Implementation Technician (4 months @ 2,500)  - Travel, Subsistence, Communication | 10,000  10,000  10,000  5,000 | 35,000 |
| 2 | Conversion kits - For Manufacturing (65 companies @ 5 kits @ 1,000)  - For servicing (100 practitioners @ 5 kits@ 100) | 65,000  50,000 | 115,000 |
| 3 | Tooling (details below) - 100 sets @ 700 US$ | 70,000 | 70,000 |
| 4 | Workshops - 5 @ 10,000 | 50,000 | 50,000 |
| 5 | Contingencies - 10% of sub-total |  | 27,000 |
| 6 |  |  |  |
| Total Tranche-II | | | 297,000 |
| Grand Total Tranche I & II | | | 869,000 |

For the first funding tranche only, the budget that will be used is as follows:

|  |  |  |
| --- | --- | --- |
| **Account** | **Budget Description** | **Amount 2011 (USD)** |
| 71200 | International Servicing Consultant | 10,000 |
| 71300 | National Consultant HC | 20,000 |
| 72100 | MOA\* with HC Producer | 542,000 |
|  |  | **572,000** |

**\*: Memorandum of Understanding between Govt and Enterprise, please see part VI below.**

When the second funding tranche will be approved the balance of US$ 297,000 for this subproject will be distributed in a similar fashion.

**ACTIVITY 3: Project coordination, management activities.**

This component was severely reduced by the Executive Committee and reduced from US$ 1,000,000 to US$ 360,000 for the 5-year duration. Please refer to annex 4.5 of the HPMP for details on this component. The Committee also cut this budget in half between UNDP and UNIDO, so that UNDP’s component is limited to only US$ 36,000 per year. The division of roles between both agencies was discussed in length with the NOO and during the first year, UNDP would be as follows:

|  |  |  |
| --- | --- | --- |
| **Account** | **Budget Description** | **Amount 2011 (USD)** |
| 71200 | International Consultants Monitoring | 10,000 |
| 71300 | National Consultants Monitoring\*\* | 13,040 |
| 72200 | Equipment | 2,500 |
| 71600 | Travel | 8,300 |
| 74500 | Miscellaneous | 2,160 |
|  |  | **36,000** |

**\*: All these activities will be implemented through the usual NEX modalities. However the international consultants will be centrally managed by HQ for economies of scale (combining of various countries in each visit).**

**\*\*: UNIDO would be responsible for the recruitment of a project assistant.**

**\*\*\*: The National Consultant line in this component may be pooled together with the National Consultant lines of the other components giving a combined budget of US$ 20,000 + US$ 20,000 + US$ 13,040 = US$ 53,040. If preferred a long time staff at the NOA, NOB or NOC level may be appointed instead of the consultants.**

**PART IV: Total Budget and Workplan for Stage 1 Year 1 of the Nigeria HPMP (2011)**

The table below covers the activities to be implemented by UNDP in 2011 under tranche 1 of Stage1.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MLF Outcome/Atlas Activity** | **Responsible Party** | **Account** | **Budget Description** | **Amount 2011 (USD)** | **Dept. ID** | **Oper. Unit** | **Fund Code** | **Impl Agy** | **Donor ID** |
| ACTIVITY 1: Polyurethane Foam Sector Plan | Federal Ministry of Environment, National Ozone Office | 71200 | International Foam Consultants | 20,000 | B0084 | t.b.d. | 63080 | t.b.d. | 10009 |
| 71300 | National Consultant Foam | 20,000 | t.b.d. | t.b.d. | 63080 | t.b.d. | 10009 |
| 72100 | MOA with System House 1 | 103,801 | t.b.d. | t.b.d. | 63080 | t.b.d. | 10009 |
| 72100 | MOA with System House 2 | 103,801 | t.b.d. | t.b.d. | 63080 | t.b.d. | 10009 |
|  |  |  |  | **247,603** |  |  |  |  |  |
| ACTIVITY 2: Production of Refrigerant-grade Hydrocarbons | Federal Ministry of Environment, National Ozone Office | 71200 | International Servicing Consultant | 10,000 | B0084 | t.b.d. | 63080 | t.b.d. | 10009 |
| 71300 | National Consultant HC | 20,000 | t.b.d. | t.b.d. | 63080 | t.b.d. | 10009 |
| 72100 | MOA with HC Producer | 542,000 | t.b.d. | t.b.d. | 63080 | t.b.d. | 10009 |
|  |  |  |  | **572,000** |  |  |  |  |  |
| ACTIVITY 3: Project coordination, management and sensitization activities | Federal Ministry of Environment, National Ozone Office | 71200 | International Consultants Monitoring | 10,000 | B0084 | t.b.d. | 63080 | t.b.d. | 10009 |
| 71300 | National Consultants Monitoring | 13,040 | t.b.d. | t.b.d. | 63080 | t.b.d. | 10009 |
| 72200 | Equipment | 2,500 | t.b.d. | t.b.d. | 63080 | t.b.d. | 10009 |
| 71600 | Travel | 8,300 | t.b.d. | t.b.d. | 63080 | t.b.d. | 10009 |
| 74500 | Miscellaneous | 2,160 | t.b.d. | t.b.d. | 63080 | t.b.d. | 10009 |
|  |  | **36,000** |  |  |  |  |  |
|  |  |  | **GRAND TOTAL** | **855,603** |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

|  |  |
| --- | --- |
| **Note1:** | For the international consultants, the Dept ID “B0084” ought to be used to allow MPU to manage these lines from HQ |

**PART V: Time Schedule**

The time schedule (implementation milestones) for the activities for tranche 1 of Stage 1 of the HPMP is:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Line of Action** | **Components of Activity** | **Duration** | **2011** | | | |
| **1** | **2** | **3** | **4** |
| 1. Foam Sector Programme (excluding enterprises using HCFC 22 which belong to next programme) | a) Supply of foam systems Upgrade of 2 local systems facilities for supply of fully formulated systems with methyl formate and/or methylal for RPF applications | 1Q11-4Q12 | **X** | **X** | **X** | **X** |
| 3. Refrigeration and AC Servicing Programme (RACS) | 1. Individual Project for HC Production (Pamaque) | 1Q11-4Q12 | **X** | **X** | **X** | **X** |
| 4. Project Coordination, Management and Sensitization Programme | 1. Personnel | 1Q11-4Q14 | **X** | **X** | **X** | **X** |
| 2. National Consultants | 1Q11-4Q14 | **X** | **X** | **X** | **X** |
| 3. International Consultants | 1Q11-4Q14 | **X** | **X** | **X** | **X** |
| 6. Travel | 1Q11-4Q14 | **X** | **X** | **X** | **X** |
| 7. Communications & Miscellaneous | 1Q11-4Q14 | **X** | **X** | **X** | **X** |

ANNEX A

Maintaining a level playing field in Nigeria by ensuring that the development process of the HPMP identified, included and/or took into account all relevant stakeholders[[1]](#footnote-2)

In line with Decision 53/37 (h) of the Executive Committee of the Multilateral Fund of the Montreal Protocol (ExCom), relevant data and information were collected countrywide to determine the consumption of HCFC, both at the national level and at the enterprise level. This obligatorily included all stakeholders as defined above which also included any Nigerian enterprises who would be in a position to manufacture alternative refrigerants in-situ. Throughout the process numerous opportunities and mechanisms were provided to ensure that all relevant stakeholders were involved and to correct any omissions.

In order to validate the collected data relevant to all stakeholders in Nigeria, and in order to ensure both the thoroughness and transparency of the process, a large number of publicized (press, media) and documented steps (reports) were implemented amongst which:

* Inception Workshop organized by the NOO to bring together the relevant stakeholders, responsible implementing agencies (UNDP, UNIDO, Japan) and their respective international consultants. The objective of which was to provide the stakeholders with an overview and detailed information on the HPMP development process and requirements, and agree on best way forward to gather the pertinent information, develop a coherent national strategy for HCFC phase-out and generally develop a national HPMP in an inclusive and collaborative manner;
* Design of questionnaires by the NOO, in collaboration with the implementing agencies and their International Consultants. The questionnaires were designed in such a way as to provide all information required to accurately describe the users, consumption, uses and trends for HCFC in the country as a whole and, in the relevant sub-sectors. At the enterprise level relevant information including baseline equipment and materials, year of establishment of the enterprise and installation of manufacturing facilities, product type, equipment and, various issues that may affect enterprise eligibility for project funding was collected;
* Selection of four National Consultants to assist the NOO to collect and analyze data both at the national and enterprise level. Comprehensive data were collected at the national level through the Licensing System and surveys of importers and distributors “top-down” survey and, at the enterprise level “bottom up” surveys were conducted by the national consultants;
* Initiation of data collection at the national level through interactions with importers and distributors of HCFCs and Nigeria Customs Service which was further validated with the NOO and OPIAMU. Visits were made to the offices and operational areas of FMENV, NAFDAC, NCS, UNDP, OPIAMU and Importers of HCFCs across the country with air/road travels to Abuja, Kano, Kaduna, Port Harcourt, Onitsha and Lagos, Ibadan and other cities.
* Primary data gathering in the field by national consultants and, use of secondary data sources involving desktop review of information and materials. The sources of data for determination of consumption for HCFCs in Nigeria were the NOO (licensing system), OPIAMU, NCS, NAFDAC, HCFC importers, distributors, manufacturers and end-users. All documents deemed necessary were obtained and verified for correctness, reviewed and analyzed, and results are documented in the HPMP. The NCS, NAFDAC, NOO and OPIAMU as well as the importers, distributors, manufacturers using HCFCs and end-users of HCFCs made all relevant documents available;
* Validation workshop, designed to include all stakeholders. This was essentially conceived as a platform to ensure that all of the information gathered, as well a the strategies contemplated, were optimal to achieve the planned result of phasing-out HCFC’s from Nigeria, in accordance with the calendar of the Montreal Protocol.

The surveys carried out in Nigeria were as comprehensive as possible, and made best attempts to follow the chain of ODS supply from the time when the substances were ordered and imported into the country and passed to distributors, consumers (when applicable) and manufacturers. In addition, close collaboration with industrial associations such as MAN (Manufacturers Association of Nigeria) and NARAP (National Association of Refrigeration and Air-conditioning Practitioners) was also ensured and was deemed essential, as many of the HCFC-using enterprises are SMEs including those in the informal sector. NARAP’s extensive collaboration made it possible to successfully identify relevant SMEs in the country, as most of the enterprises are members of NARAP.

In short, and as illustrated in the preceding paragraphs, the HPMP has been established after a thorough process during a project preparation stage, in which various national consultants have conducted in-depth and country-wide surveys to identify consumers of HCFC in Nigeria. Both an inception workshop at the beginning of the project preparation phase and a stakeholder workshop towards the end of the same were held, during which the major stakeholders have determined the strategic lines and priorities that the country would need to follow to ensure a proper phase-down of the consumption of HCFCs. In addition, the Executive Committee also has specific guidelines on what sectors to fund first, for example a higher priority is given to HCFC-141b in view of this chemical’s higher ODP (potential to destroy the ozone layer) as compared to HCFC-22. Having said this, further funding will eventually allow the Government to address all HCFC consumers in Nigeria throughout the whole duration of the HPMP (stage 1 and beyond).

# MEMORANDUM OF AGREEMENT

This Memorandum of Agreement (hereinafter referred to as the “Agreement”) made this [32nd of February 2099], among Ministry of Environment and Forests (hereinafter referred to as “MOEF”), Department of Environment, Montreal Protocol Unit (hereinafter referred to as “DOE”) and ENTERPRISE XYZ Hi-Tech Industries Limited (hereinafter referred to as the “Recipient”) for phase-out of HCFC-141b technology and converting to cyclopentane-based technology in the manufacture of refrigeration equipment;

WHEREAS the technology conversion proposal for the Recipient was approved by the Executive Committee of the Multilateral Fund to the Montreal Protocol in its 62nd Meeting held in December 2010;

WHEREAS the Recipient agrees to phase out the use of HCFC-141b and convert to cyclopentane as the blowing agent in the insulation foam in manufacture of refrigeration equipment;

NOW, therefore, the Parties hereto agree as follows:

**1. Responsibilities of Recipient:**

* 1. Recipient agrees to carry out activities as described in the Terms of Reference in Annex-A (hereinafter referred to as “Activities”), which form an integral part of this Agreement.

* 1. None of the funds provided pursuant to this Agreement may be used any purpose other than those expressly set forth in Annex-A.
  2. Unless specifically mentioned otherwise, Activities shall be deemed to be inclusive of design, engineering, assembly, fabrication, supply, installation, start-up, trial runs and commissioning, and all materials, labor, consumables, etc.
  3. Recipient shall bear any costs required for successful conversion to fully HCFC-free technology over and above the approved funds as described in 3.1 below.
  4. Recipient shall permanently discontinue the use of HCFCs on or before **32 June 2099** and dispose all redundant baseline equipment that may been replaced under the scope of this Agreement and allow monitoring inspections by MOEF, UNDP, DOE, or their designated representatives during project implementation and after project completion, to verify the same.
  5. Recipient undertakes to obtain all regulatory and other approvals that may be required for carrying out the Activities at their own cost and in accordance with the prevailing laws.
  6. Recipient undertakes to obtain all regulatory and other approvals that may be required for carrying out all activities in accordance with the prevailing laws.
  7. Activities shall be carried out at the following location:

ENTERPRISE XYZ Hi Tech Industries Ltd  
Holding No. 1-25/1, Ward No. 07,

XYZ Street,

Wala-wala City, COUNTRY XYZ

**2. Duration**

* 1. This Agreement will come into effect on (--------) and shall be effective until 32 June 2099.
  2. The duration of the agreement may be extended at the discretion of DOE.

**3. Compensation**

* 1. As full consideration for the activities carried out by the Recipient, Recipient shall be paid a total amount of up to US Dollars 1,042,824 (US Dollars One Million Forty Two Thousand Eight Hundred and Twenty Four only) in accordance with the milestones, indicators and amounts set forth in Annex-B.

* 1. All payments shall be made in equivalent local currency based on applicable UN exchange rates.
  2. Benchmarks would be maximum amounts rather than a fixed amount. Proof must be given by the enterprise to Government through invoices (or salary-statements for staff time) that expenditures were made up to or higher than the benchmark in order to receive the maximum level of the benchmark. If the costs are shown to be lower, the lower amount will be the one that will be paid.
  3. Enterprises will have to show that for the items they have to procure in a given benchmark, bidding took place as per accepted practice in Nigeria to ensure that the lowest cost items were obtained.
  4. NOO staff and/or international or national consultants sent by NOO will have the responsibility to carry out this due-diligence exercise for each benchmark. Once cleared, UNDP-Abuja will make the payment.

* 1. ~~The payment amounts are not subject to any adjustment or revision because of price or currency fluctuations or the actual costs incurred by the Recipient in the performance of the Agreement.~~

**4. Records, Information and Reports**

4.1 Recipient shall maintain clear, accurate and complete records in respect of the funds received under this Agreement, in such a manner that the receipts and expenditures of the funds will be shown separately on such books and records and can be easily checked.

4.2 Recipient shall furnish, compile and make available at all times to DOE, any records or information, oral or written, which DOE may reasonably request in respect of the services performed by the Recipient.

* 1. Recipient shall provide to DOE, a report containing the status of progress of implementation of Activities and status of expenditures undertaken, every two months.

**5. General Provisions**

5.1 This Agreement and the Annexes attached hereto shall form the entire Agreement between Recipient, MOEF and DOE, superseding the contents of any other negotiations and/or agreements, whether oral or in writing, pertaining to the subject of this Agreement.

5.2 Recipient shall carry out all activities under this Agreement with due diligence and efficiency (see footnote under annex 2 of this MOA for more clarifications in this regard).

5.3 DOE undertakes no responsibilities in respect of life, health, accident, travel or any other insurance coverage for any person, which may be necessary or desirable for the purpose of this Agreement or for any personnel performing services under this Agreement. Such responsibilities shall be borne by the Recipient.

5.4 The rights and obligations of theRecipient are limited to the terms and conditions of this Agreement. Accordingly, the Recipient and personnel performing services on its behalf shall not be entitled to any benefit, payment, compensation or entitlement except as expressly provided in this Agreement.

5.5 The Recipient shall be solely liable for claims by third parties arising from the Recipient’s acts or omissions in the course of performing this Agreement and under no circumstances shall DOE, MOEF or UNDP be held liable for such claims by third parties.

5.6 Equipment purchased by the Recipient with funds provided under this Agreement shall be used for the purpose indicated in the Agreement throughout the period of this Agreement.

5.7 No modification of or change in this Agreement, waiver of any of its provisions or additional contractual provisions shall be valid or enforceable unless previously approved in writing by the parties to this Agreement or their duly authorized representatives in the form of an amendment to this Agreement duly signed by the parties hereto.

5.8 Any controversy or claim arising out of, or in accordance with this Agreement or any breach thereof, shall unless it is settled by direct negotiation, be settled in accordance with the COUNTRY XYZ Arbitration Act and rules therein as at present in force. Where, in the course of such direct negotiation referred to above, the parties wish to seek an amicable settlement of such dispute, controversy or claim by conciliation, the conciliation shall take place in accordance with the provisions of the COUNTRY XYZ Arbitration Act and rules therein as at present in force. The parties shall be bound by any arbitration award rendered as a result of such arbitration, as the final adjudication of any such controversy or claim.

5.9 Nothing in or relating to this Agreement shall be deemed a waiver of any privileges and immunities of the DOE, MOEF and UNDP.

IN WITNESS WHEREOF, the undersigned, duly appointed representatives of Recipient, and DOE respectively, havesigned the present Memorandum of Agreement on the dates indicated below with their respective signatures.

|  |  |  |
| --- | --- | --- |
| **On behalf of Recipient:** | **On Behalf of Ministry of Environment and Forests:** | **On behalf of DOE:** |
| **Managing Director/Corporate Secretary**  ENTERPRISE XYZ Hi-Tech Industries Limited | **Secretary**  Ministry of Environment and Forests | **Director General**  Department of Environment |
| Date: | Date: | Date: |

**ANNEX-1**

**Terms of Reference**

ENTERPRISE XYZ Hi-Tech Industries Limited will phase out the usage of HCFC-141b as a blowing agent for the polyurethane foam insulation in its manufacturing of refrigeration equipment by converting to cyclopentane technology. In order to achieve this, ENTERPRISE XYZ Hi-Tech Industries Ltd. shall carry out the following activities and any other actions not necessarily limited to those mentioned below:

1. Cyclopentane storage, delivery and handling system for cyclopentane, comprising of under/above ground carbon steel storage tank of 60 m3 capacity, two delivery pumps (one working and one standby) with electric drive motors of explosion proof rating and the necessary piping, valves and fittings including gas return and pressure relief lines, for transferring cyclopentane from the storage tank to the pre-mixing unit.
2. One pre-mixing station comprising of a static mixer, a jacketted buffer tank, metering/recirculating pumps for the components and chemical loading pumps, that incorporate the safety requirements for cyclopentane.
3. Replacement of the existing inter-connecting high pressure piping and fittings for transfer of the chemicals, between the pre-mixing unit, foam dispensers and the mixing heads, with those suited for handling cyclopentane and meeting the requirements of the new layout.
4. Retrofitting/modification and/or replacement of the existing four foam dispensers to enable operation with cyclopentane, including all safety requirements
5. Retrofitting/modification and/or replacement of the heating systems of the existing cabinet and door foaming fixtures to enable operation with cyclopentane, including all safety requirements
6. Introduction of a water conditioning system, to provide heating and cooling for the cabinet and door foaming fixtures, and also for the temperature control of chemicals, comprising of a water heater, chilling unit, interconnecting piping, valves and fittings, expansion tank(s), insulation, controls and instrumentations
7. A ventilation and exhaust system for maintaining safe concentrations of cyclopentane in air comprising of sheet metal ducting and blowers/fans for supply air as well as for exhaust of air extracted from the all vulnerable locations such as premixing unit area and foaming areas.
8. A safety system for detection and monitoring of hydrocarbon concentrations and for prevention of fire and explosion hazards comprising of hydrocarbon sensors/detectors at assorted locations, alarm, and control system, water sprinkler system for fire extinguishing covering the vulnerable areas, portable fire-extinguishers for areas unsegregated from the vulnerable areas, a nitrogen system for mold flushing to prevent static electricity generation and anti-static flooring for vulnerable areas
9. Electrical works for the conversion complying with safety regulations pertaining to areas handling flammable/explosive substances comprising of main control panel and local distribution panels for the new electrical equipment, power and control cabling, grounding and terminations, control and interlocking wiring for the safety systems and a back-up AC electric power generator covering the requirements of the ventilation, fire extinguishing, alarm and nitrogen systems.
10. Civil and miscellaneous works comprising of excavation and refilling for the underground cyclo-pentane storage tank, foundations and housing for all new equipment, civil works for pipe/duct/cable support installation, making and refinishing wall/floor openings, floor finishing, relocation of existing foam dispensers and other equipment, supports/foundations for installation of new equipment, etc.
11. Trials for validation of new formulations, process and equipment covering the cost of chemicals, raw materials/consumables and utilities required during commissioning.
12. Training and reorientation of production personnel to be able to work with the new formulations and process and for establishing safe practices in handling flammable/explosive substances

**ANNEX-2**

**Milestones, Indicators and Payments**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Milestone** | **Indicator** | **Amount (US$)** |
| 1 | Finalization of plant layout, product redesign and implementation plan | Plant layout drawings, specifications of refrigerators with non-HCFC foaming technology and implementation schedule | 150,000 |
| 2 | Retrofitting/modifications of existing foam dispensers and foaming fixtures | Visual inspection at site | 240,000 |
| 3 | New equipment and systems, such as cyclopentane storage and handling system, premixing station and water conditioning system | Visual inspection at site | 450,000 |
| 4 | Installation, trials, commissioning and safety audit | Visual inspection at site and receipt of satisfactory report of safety audit | 100,000 |
| 5 | Phase-out of HCFC-141b in the manufacturing operation | Visual inspection at site and signing of handover protocol | 102,824 |
|  |  |  | **1,042,824** |

Footnote:

As stipulated in the MOA document, due diligence will need to be carried out before payment of any benchmarks can be made. It is therefore understood that:

1. Benchmarks would be maximum amounts rather than a fixed amount. Proof must be given by the enterprise to Government through invoices (or salary-statements for staff time) that expenditures were made up to or higher than the benchmark in order receive the maximum level of the benchmark. If the costs are shown to be lower, the lower amount will be the one that will be paid.
2. Enterprises will have to show that for the items they have to procure in a given benchmark, bidding took place as per accepted practice in Nigeria to ensure that the lowest cost items were obtained.

NOO staff and/or international or national consultants sent by NOO will have the duty to carry out this due-diligence exercise for each benchmark.

1. *By stakeholders is meant all users of HCFC and HCFC containing equipment, i.e. manufacturers, importers, technicians, etc., as well the public in general.* [↑](#footnote-ref-2)