



**United Nations
Environment
Programme**

Distr.
GENERAL

UNEP/OzL.Pro/ExCom/74/28
16 April 2015

ORIGINAL: ENGLISH



EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Seventy-fourth Meeting
Montreal, 18-22 May 2015

PROJECT PROPOSALS: EGYPT

This document consists of the comments and recommendations of the Fund Secretariat on the following project proposals:

Foam

- Demonstration of low cost options for the conversion to non-ODS technologies in polyurethane foams at very small users UNDP

Fumigant

- Technical assistance on alternatives to methyl bromide in the palm date sector UNIDO

PROJECT EVALUATION SHEET – NON-MULTI-YEAR PROJECT

EGYPT

PROJECT TITLE(S)

BILATERAL/IMPLEMENTING AGENCY

(a) Demonstration of low cost options for the conversion to non-ODS technologies in polyurethane foams at very small users	UNDP
--	------

NATIONAL CO-ORDINATING AGENCY

Egypt Environmental Affairs Agency,
national ozone unit

LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT

A: ARTICLE-7 DATA (ODP TONNES, 2013, AS OF APRIL 2015)

HCFCs	297.0
-------	-------

B: COUNTRY PROGRAMME SECTORAL DATA (ODP TONNES, 2013, AS OF APRIL 2015)

HCFC-22	187.9
HCFC-123	0.5
HCFC-141b	82.6
HCFC-142b	8.9
HCFC-141b in imported pre-blended polyol	17.1

HCFC consumption remaining eligible for funding (ODP tonnes)	310.61
--	--------

CURRENT YEAR BUSINESS PLAN ALLOCATIONS		Funding US \$	Phase-out ODP tonnes
	(a)		n/a

PROJECT TITLE:	
ODS use at enterprise (ODP tonnes):	n/a
ODS to be phased out (ODP tonnes):	n/a
ODS to be phased in (ODP tonnes):	n/a
Project duration (months):	12
Initial amount requested (US \$):	340,000
Final project costs (US \$):	340,000
Incremental capital cost:	310,000
Contingency (10 %):	30,000
Incremental operating cost:	0
Total project cost:	340,000
Local ownership (%):	n/a
Export component (%):	n/a
Requested grant (US \$):	340,000
Cost-effectiveness (US \$/kg):	n/a
Implementing agency support cost (US \$):	23,800
Total cost of project to Multilateral Fund (US \$):	363,800
Status of counterpart funding (Y/N):	N
Project monitoring milestones included (Y/N):	Y

SECRETARIAT'S RECOMMENDATION

Pending

PROJECT DESCRIPTION

1. On behalf of the Government of Egypt, UNDP as the designated implementing agency has submitted to the 74th meeting a request for funding a demonstration of low-cost options for the conversion to non-ODS technologies in polyurethane (PU) foams at very small users at the amount of US \$340,000, plus agency support costs of US \$23,800. This project is prepared in a response to decision 72/40¹. The proposal as originally submitted is attached.

Objectives

2. The project objectives are to:
- (a) Develop a low-cost foam dispensing unit for pour-in-place applications that includes an air compressor but does not rely on electrical power, or alternatively explore options for reducing the cost of foam dispensers available on the market; and
 - (b) Explore the option of pre-packaging PU foam systems that are sealed, have a long lifetime and can be used upon demand (they are currently in use in Colombia, Mexico, and the United States of America for certain applications).

Methodology

3. The implementation of the demonstration project has two parts:
- (a) Selection of an importer/assembler/service provider of foam dispensers; review of existing equipment and proposal of modifications for lowering the cost; issuance of a request for proposals for manufacturing a new low-cost foam dispenser; validation of equipment; and a workshop to present the outcomes; and
 - (b) Identification existing pre-packaged fully developed polyol systems; evaluation of these systems in Egypt followed by other Article 5 countries with PU foam system houses; installation of a local production facility within a systems house; trials and testing at one or two selected foam enterprises; and a workshop to present the outcomes.
4. One of the considerations will be local assembly of foam dispensers and local formulation of the systems.

Project budget

5. The summary of the project cost is provided in Table 1.

Table 1. Project cost by activity

Activity	Description	Budget (US \$)
Project management	Local expert	30,000
	International expert	30,000
Identifying local capacity	Technical study tour on equipment	10,000
	Chemical study tour on chemistry	10,000
Production equipment development and prototyping	Optimized existing equipment	50,000
	Development of new equipment	50,000
	Development of pre-packaged systems	25,000

¹ The Executive Committee decided *inter alia* to consider at its 75th and 76th meetings proposals for demonstration projects for low global-warming potential (GWP) alternatives to HCFCs within the framework established, and provided criteria for such projects.

Activity	Description	Budget (US \$)
Validation/field evaluation	Optimized existing equipment	20,000
	New equipment	20,000
	Pre-packaged systems	10,000
Technology dissemination workshop	Combined for all three approaches	25,000
Peer review/safety review/preparation	Includes safety audit, peer review, and preparation costs	30,000
Contingencies	10% of sub-total (rounded)	30,000
Total		340,000

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

6. At the 72nd meeting, after consideration of the overview of approved HCFC demonstration projects and options for additional projects to demonstrate climate-friendly and energy-efficient alternative technologies to HCFCs² under agenda item 10, the Executive Committee decided *inter alia* to consider at its 75th and 76th meetings proposals for demonstration projects for low GWP alternatives to HCFCs within the framework established, and provided criteria for such projects (decision 72/40).

7. At the 73rd meeting, the Executive Committee further discussed the low-GWP demonstration projects and feasibility studies on district cooling in the context of the consolidated business plan of the Multilateral Fund³. Further to discussions, additional guidance was also provided in order to ensure that the best proposals for demonstration projects were submitted⁴.

8. Together with the project proposal contained in the present document, bilateral and implementing agencies submitted project preparation requests and one complete demonstration projects pursuant to decision 72/40. In order to assist the Executive Committee in selecting the best demonstration project proposals submitted pursuant to this decision, the Secretariat had prepared an analysis of all these proposals only with regard to their concepts and how they comply with the guidelines provided by the Executive Committee. This analysis is contained in the document on the Overview of issues identified during project review⁵.

9. Accordingly, the Secretariat had not reviewed the demonstration project in terms of technical and costs aspects.

RECOMMENDATION

10. The Executive Committee may wish:

- (a) To consider the demonstration project of low-cost options for the conversion to non-ODS technologies in polyurethane (PU) foams at very small users in Egypt in the context of its discussion on proposals for demonstration projects for low global-warming potential (GWP) alternatives to HCFCs as described in the document on the overview of issues identified during project review (UNEP/OzL.Pro/ExCom/74/13); and

² UNEP/OzL.Pro/ExCom/72/40.

³ UNEP/OzL.Pro/ExCom/73/18.

⁴ The suggestions made by Executive Committee members are contained in paragraph 97 of document UNEP/OzL.Pro/ExCom/73/62.

⁵ UNEP/OzL.Pro/ExCom/74/13.

- (b) To request the Secretariat to resubmit the demonstration project proposal mentioned in sub-paragraph (a) above, together with its comments and recommendation, to the 75th meeting, in case the Executive Committee selects such proposal.

PROJECT EVALUATION SHEET – NON-MULTI-YEAR PROJECTS

EGYPT

PROJECT TITLE

BILATERAL/IMPLEMENTING AGENCY

(a) Technical assistance on alternatives to methyl bromide in the palm date sector	UNIDO
--	-------

NATIONAL CO-ORDINATING AGENCY

Egyptian Environmental Affairs Agency (EEAA)

LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT

A: ARTICLE-7 DATA (ODP TONNES, 2013, AS OF APRIL 2015)

Annex E, MB	55.2
-------------	------

B: COUNTRY PROGRAMME SECTORAL DATA (ODP TONNES, 2013, AS OF APRIL 2015)

Methyl bromide	55.2
----------------	------

CURRENT YEAR BUSINESS PLAN ALLOCATIONS	Funding US \$	Phase-out ODP tonnes
2014	148,020	0

PROJECT TITLE:	
ODS to be phased out (ODP tonnes):	6
Project duration (months):	12
Initial amount requested (US \$):	329,725
Final project costs (US \$):	
Incremental capital cost:	256,800
Contingency (10 %):	25,680
Incremental operating cost:	0
Total project cost:	282,480
Local ownership (%):	n/a
Export component (%):	n/a
Requested grant (US \$):	282,480
Cost-effectiveness (US \$/kg):	n/a
Implementing agency support cost (US \$):	19,774
Total cost of project to Multilateral Fund (US \$):	302,254
Status of counterpart funding (Y/N):	n/a
Project monitoring milestones included (Y/N):	Y

SECRETARIAT'S RECOMMENDATION

Blanket approval

PROJECT DESCRIPTION

11. On behalf of the Government of Egypt, UNIDO as the designated implementing agency, has submitted to the 74th meeting a request for funding for technical assistance to phase-out 10 metric tonnes (mt) (6 ODP tonnes) of methyl bromide (MB) used for fumigation in the palm dates sector at the amount of US \$329,725, plus agency support costs of US \$23,081 as originally submitted. This technical assistance project will assist the Government of Egypt to complete phase-out of all controlled uses of MB.

Background

12. At the 56th meeting, the Executive Committee approved the national phase-out plan for MB for Egypt, noting that the project would complete the introduction of all alternative technologies to completely phase-out controlled uses of MB by the end of 2013, (except for 6 ODP tonnes used in the fumigation of high moisture dates).

13. Palm dates are one of the most important cash crops in Egypt. There are more than 14 million date trees producing about 1.5 million tonnes of fresh, semi-dry and dry dates each year. Dates are harvested and marketed at three distinct stages of development (high moisture, intermediate moisture, or low moisture), which depends on the variety, climate conditions and market demand. Dry dates are harvested, spread in an open area and exposed to the sun. Once dry, they are placed in jute bags, fumigated and stored. Semi-dry dates are first washed and then placed in plastic perforated containers before fumigation. The containers are then cold stored or simply stored under plastic film if a cold room is not available.

14. Date processing in Egypt is still at an early stage of development and at present there are only a few associations of processors. Until the end of 2014, most factories fumigated dates with MB but now they are using phosphine.

15. In Egypt, controlled use of MB is exclusively for the fumigation of dates. Regulations are already in place to control the import and use of MB, monitor consumption and ensure compliance with the requirements of the Montreal Protocol. The national ozone unit (NOU) in the Egyptian Environmental Affairs Agency (EEAA) and the Pesticide Committee of the Ministry of Agriculture regulates MB distribution.

Project proposal

16. In compliance with the Montreal Protocol and its amendments, Egypt stopped importing MB in 2014 and is now facing the challenge of quickly implementing alternatives to fumigate dates. This technical assistance project is required to provide training in the use of the selected alternatives for MB.

17. After consideration of the alternative technologies available (e.g. heat, controlled atmospheres, ethyl formate, sulfuryl fluoride, phosphine), phosphine plus carbon dioxide is the only alternative registered and commercially available in Egypt. The use of this alternative requires double fumigation time as compared to MB, but is an upgrade of the phosphine technology already in use, and is thus generally familiar to most producers. In addition, phosphine is already being used by several processors and producers but is often poorly applied; therefore there is an urgent need to implement good and safe fumigation practices.

18. The technical assistance project will provide equipment (returnable cylinders of phosphine gas, pipes and connections; phosphine detection metres; protection masks, scales; and entomological analysis of samples (to check phosphine resistance)) to 36 large and medium date processors, 299 small date

farmers and traders, 30 engineers and technicians from the different Governorates responsible for MB fumigation, and 40 technicians from companies formerly licensed to fumigate with MB.

19. Two training programmes will be conducted by the Pest Management Unit of the Agriculture Research Centre (ARC) on the use and application of the phosphine plus carbon dioxide mixture, and for operators using phosphine tablets under tarpaulins. Both programmes will include practical demonstrations of fumigation in chambers and under plastic.

20. The total cost of the project (US \$329,725) includes incremental capital costs (US \$299,750) and contingencies (US \$29,975). No incremental operating costs are requested.

21. The project will be implemented and managed by UNIDO, in cooperation with the EEAA. The NOU and UNIDO will work closely with the Agriculture Directorates of each of the Governorates concerned in order to coordinate all training activities. The estimated time frame for implementation of the project is 12 months.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Decisions by the Parties to the Montreal Protocol

22. At their 15th meeting, the Parties recognized that there were no sustainable alternatives for the fumigation of dates with high moisture content, and allowed countries that use over 80 per cent of their MB consumption on high moisture dates (including Egypt), to defer the consideration of the compliance status until two years after alternatives are identified. However, these countries must not increase MB consumption on products other than high-moisture dates beyond 2002 levels (decision XV/12). The Methyl Bromide Technical Options Committee (MBTOC) of the Technology and Economic Assessment Panel (TEAP) reported⁶ that alternatives to MB are already available for this application, and this includes phosphine.

Technical issues

23. In discussing issues related to the equipment, UNIDO explained that equipment proposed is needed to successfully implement the two training programmes, to provide the trainers with the tools to ensure an effective and efficient transfer of technology, to guarantee the sustainability of the use of the selected technology and the training approach. Such equipment is also required for practical demonstration of good fumigation practices. UNIDO took into account the Secretariat's suggestion to reduce the number of equipment, particularly the phosphine cylinders and meters, and the funding requested was adjusted accordingly. The final agreed cost was US \$282,480 in the revised project proposal.

24. UNIDO also reported on the remaining activities currently being implemented under the national MB phase-out plan and confirmed that the alternative chemicals for the other controlled uses of MB are in the final stages of registration, and that due to political issues in the country, the final workshop scheduled for 2014 would be completed only in the first quarter of 2015.

⁶ Report of the Technology and Economic Assessment Panel (Volume I): progress report (2002).

RECOMMENDATION

25. The Secretariat recommends blanket approval of the technical assistance on alternatives to methyl bromide (MB) in the palm date sector in Egypt at the level indicated in the table below, on the understanding that no additional funding will be provided for Egypt for the phase-out of controlled uses of MB in the country; and that the Government of Egypt is committed to sustaining the complete phase-out of MB by fully implementing the ban on imports of MB which has been enforced since 1 January 2015.

	Project title	Project funding (US \$)	Support cost (US \$)	Implementing agency
(a)	Technical assistance on alternatives to methyl bromide in the palm date sector	282,480	19,774	UNIDO

COUNTRY: Egypt **IMPLEMENTING AGENCY:** UNDP

PROJECT TITLE: Demonstration of Low Cost Options for the Conversion to non-ODS Technologies in PU Foams at Very Small Users (VSUs)

PROJECT IN CURRENT BUSINESS PLAN: Based on ExCom Decision 73/27

SECTOR: Foams
Sub-Sector: Rigid and Integral Skin PU Foams

ODS USE IN SECTOR
Baseline: 485

BASELINE ODS USE: n/a (demonstration project)

PROJECT IMPACT (ODP targeted): n/a (demonstration project)

PROJECT DURATION: 12 months

PROJECT COSTS: US\$ 340,000

LOCAL OWNERSHIP: n/a

EXPORT COMPONENT: n/a

REQUESTED MLF GRANT: US\$ 340,000

IMPLEMENTING AGENCY SUPPORT COST: US\$ 23,800

TOTAL COST OF PROJECT TO MLF: US\$ 363,800

COST-EFFECTIVENESS: n/a

PROJECT MONITORING MILESTONES: Included

NTL. COORDINATING AGENCY: Egypt Environmental Affairs Agency (EEAA),
National Ozone Unit

PROJECT SUMMARY

Egypt is a Party to the Vienna Convention and the Montreal Protocol. It also ratified the London, Copenhagen and Montreal amendments. The country is fully committed to the phaseout of HCFCs and willing to take the lead in assessing and implementing new HCFC phaseout technologies, particularly in the foam sector—as it did for CFCs in 1992 when it submitted and completed the first foam sector investment projects ever under the MLF. Egypt has local PU system houses that frequently combine importations and distributions for major international chemical and equipment manufacturers with local blending for SMEs. In addition, most international PU chemicals suppliers are represented with offices or their own system houses.

The objective of this project is to develop, optimize, validate and disseminate easy to use PU systems and low cost equipment for the use at very small user (VSUs) in the manufacture of PU rigid insulation and integral skin foams. Chemically, the use of long term stable, prepackaged two component systems is envisioned. Equipment wise, optimization of existing low cost equipment as well as newly developed, special purpose PIP equipment is foreseen. The exercise will be completed with a dissemination workshop.

IMPACT OF PROJECT ON COUNTRY'S MONTREAL PROTOCOL OBLIGATIONS

This project is a pilot project aimed to optimize PU sector technologies and will contribute indirectly to the fulfillment of Egypt's Montreal Protocol obligations. If successfully validated, the optimized technology will contribute to availability of cost-effective options that are urgently needed to implement HCFC phase-out, particularly at SMEs.

Prepared by: Bert Veenendaal

Date: March, 2015

PROJECT OF THE GOVERNMENT OF EGYPT

DEMONSTRATION OF LOW COST OPTIONS FOR THE CONVERSION TO NON-ODS TECHNOLOGIES IN PU FOAMS AT VERY SMALL USERS (VSUs)

1. PROJECT OBJECTIVES

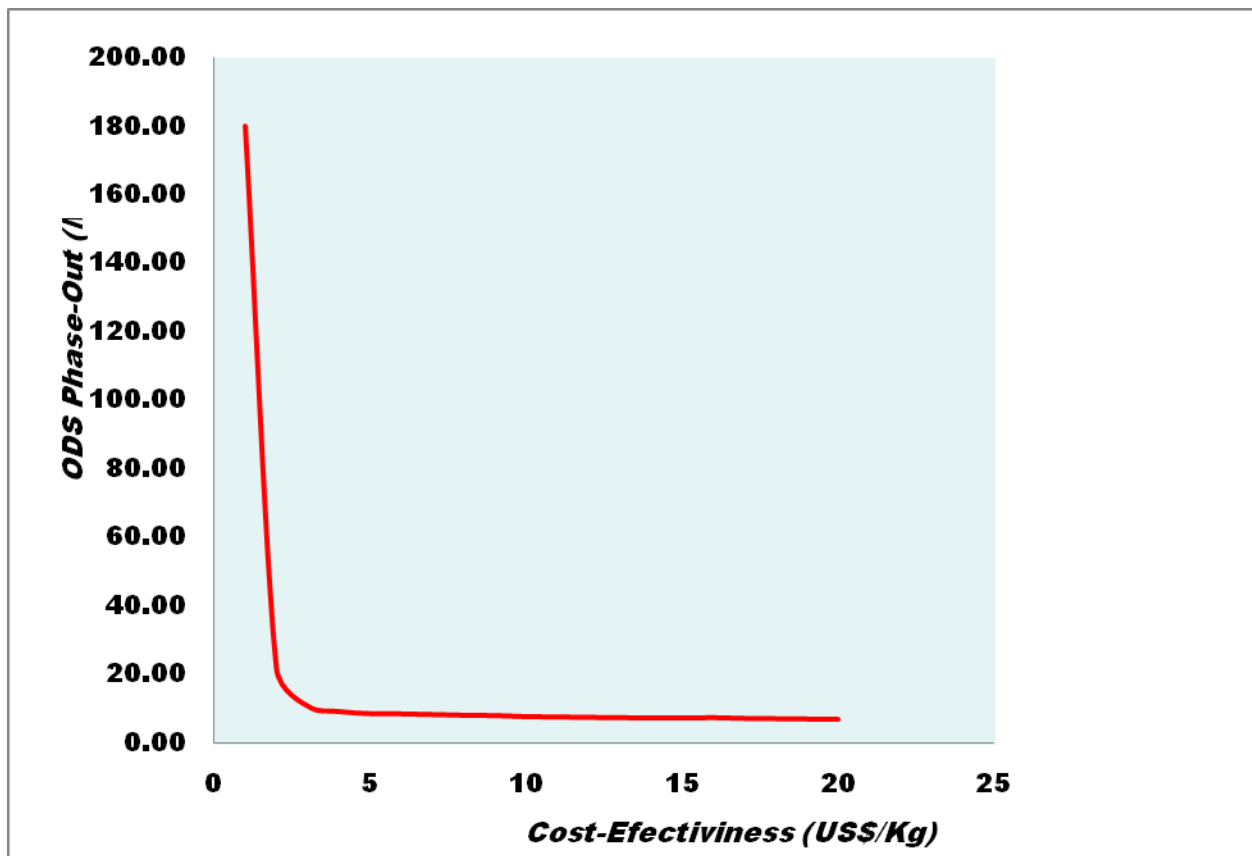
The objectives of this project are to:

- Develop and validate low cost options for ODS phaseout at very small PU users;
- Demonstrate these in a representative amount of downstream operations, and
- Transfer the technology to interested system houses and other users

2. CONTEXT

MLF projects are since 1993 subject to Cost-Effectiveness (C/E) Thresholds. These thresholds are not taking consumption volumes into account. Small foam enterprises generally operate just one foam dispenser—or practice hand-mix—costs. Hand-mix operations are deemed unsafe and of industrial hygienic concern as generally no emission control or personal protection is used.

The cost effectiveness increases exponentially when the consumption decreases as following graph shows:



The Foam Sector, which counts a large amount of small consumers, has a large experience in working with small users and related need for cost containment to meet applicable limits on cost-effectiveness. The first attempt to deal fairly and effectively with small users (SMEs) was a 1995 study by UNDP called “Determination of Cost-Effective Phaseout Approaches for Enterprises with relatively Small ODS Use”. The MFS prepared, based on this study, Document 17/55 (June 30, 1995) called “Strategy Paper for Small Foam producing Enterprises”. It recommended dividing projects by size and foam category; to assign to large and medium sized enterprises specific C/E thresholds and to make the approval of small projects subject to specific cost containment procedures. This would have addressed the issue. However, the study was not accepted at that time and was never transformed into a written policy. Nevertheless, anybody who reads the document and is familiar with approval procedures will recognize later use of many of the proposed elements.

Following approaches have been tried by UNDP cost containment when dealing with SMEs:

- Management : Use local experts; work with group projects
- Technology : Evaluate and validate new technologies
- Equipment : Use more retrofit; develop low-cost equipment
- Trials/Tests : Get suppliers involved
- IOCs : Regardless of the technology applied, calculate IOCs based on the lowest cost (validated) technology

The largest success has been creating ODS projects using PU System Houses as project managers. This approach provided not only local project management but also larger economy of scale and supplier-arranged trials/tests.

Also, the validation of new technologies was successful. UNDP conducted in the foam sector ten (10) demonstration projects to evaluate new—or to modify existing—technologies. Through this program, methyl formate (MF) and methylal (ML)—both oxygenated hydrocarbons or HCOs—are already approved in over 10 countries-- Brazil, Cameroon, Dominican Republic, Egypt, El Salvador, Nigeria, Russia, South Africa and Trinidad-Tobago and in several of these countries in the mean time successfully completed. One system house in Mexico offers preblended hydrocarbons. While some of the demonstrated technologies suffer under economic constraints, such as high license fees (supercritical CO₂) or high operating costs (HFOs) the program in general has saved the MLF already millions in project costs.

Attempts to decrease equipment costs had mixed results:

- Retrofit of equipment has significantly increased when using water, MF or ML technologies (Mexico, Dominican Republic, El Salvador)
- Renting out of equipment to very small users (VSUs) failed because of frequent mishandling of equipment as well as chemicals (Mexico, Egypt)
- An attempt to import low cost equipment in one country (Colombia) failed because lack of training and local equipment service

This project will learn from past failures and develop approaches that include:

- Better efficiency in the use of chemicals
- Economizing of existent equipment
- Developing new, low cost equipment

Special emphasis will be put on local, sustainable capacity for training and equipment service.

3. PROJECT DESCRIPTION

The concept of this project is to develop

- A low cost foam dispensing unit for PIP applications that includes an air compressor but otherwise not relying on electrical power. There will be immediate use for such equipment in existing projects in Egypt, Nigeria and Mexico without changing existing budgets
- Alternatively, look into the option of economizing existing low cost equipment already on the market
- In addition, in particular for infrequent PU users, look into the option of prepackaging PU systems that are sealed, have a long lifetime and can be used upon demand (they are currently in use in the USA for certain applications)

The implementation of the equipment part of the project will be staged as follows:

1. The selection of an importer/assembler/service provider.
2. Review of existing offerings of low cost equipment followed by negotiations with selected providers on required modifications and potential cost savings
3. Issuance of a request for proposals for new, low cost equipment
4. Selection of equipment to be validated
5. Validation of equipment
6. Workshop to present the outcome(s)

The implementation of the chemical part of the project is envisioned as follows:

1. Selection of a system house willing to cooperate on this approach
2. Identification of existing prepackaged systems (there are reportedly such systems in the USA, Mexico and Colombia)
3. Evaluate having this technology applied in Egypt (and later in other A5 countries with PU system houses)
4. Install a local production facility
5. Conduct trials/tests
6. Workshop to present the outcome(s)

Previous experience taught local, knowledgeable service and availability of spare parts is essential. Therefore, one of the considerations will be local assembly of selected equipment.

Likewise, prepackaged systems have only a chance in the market when produced and marketed—or at least backed-up—by a local system house.

While the project includes trials/tests, these will be conducted to the extent possible at system house development facilities and one or two selected customers. Industrialization should take place through National Phaseout Plans. It should be noted that these plans for Egypt and Mexico have already funds dedicated to VSUs.

4. PROJECT COSTS

Cost forecasts for demonstration projects are problematic as these projects are by nature unpredictable. UNDP has used to the extent possible guidance provided by the Secretariat in Doc 55/47 Annex III, Appendix II. Applying this guidance leads to the following summarized cost expectations:

DEVELOPMENT/OPTIMIZATION/VALIDATION/DISSEMINATION			
#	ACTIVITY	BUDGET (US\$)	REMARKS
1	Project Management	30,000 30,000	Local expert International expert
2	Identifying local capacity	10,000 10,000	Technical study tour on equipment Chemical study tour on chemistry
3	Production equipment development and prototyping	50,000 50,000 25,000	Optimized existing equipment Development of new equipment Development of prepackaged systems
4	Validation/Field evaluation	20,000 20,000 10,000	Optimized existing equipment New equipment Prepackaged systems
5	Technology Dissemination Workshop	25,000	Combined for all three approaches
7	Peer review/Safety review/Preparation	30,000	Includes - safety audit - peer review - preparation costs
8	Contingencies	30,000	10% of sub-total/rounded
TOTAL		340,000	

5. IMPLEMENTATION FRAMEWORK AND MONITORING

Following tentative implementation schedule applies:

TASKS	2015				2016			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Project Start-up								
MF Project Approval		X						
Receipt of Funds		X						
Grant Signature			X					
Monitoring/oversight activities in place			X	X	X	X	X	
Implementation								
Selection of partner			X					
Identification, evaluation and optimization of existing and new approaches				X	X			
Industrialization, trials/tests						X	X	
Dissemination Workshop								X

MILESTONES FOR PROJECT MONITORING

TASK	MONTH*
(a) Receipt of funds	2
(b) Project document signatures	3
(c) Bids prepared and requested	5
(d) Contracts Awarded	6
(e) Equipment Delivered	8
(f) Training Testing and Trial Runs	10
(g) Completion	11
(h) Dissemination/reporting	12

* As measured from project approval

6. REPORTING

A final report can be expected 12 months after project approval. Interim reporting will follow existing reporting guidelines.