



**United Nations
Environment
Programme**

Distr.
GENERAL

UNEP/OzL.Pro/ExCom/74/18*
17 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

WORLD BANK's WORK PROGRAMME FOR 2015

*Revised for technical reasons on 20th April 2015.

Pre-session documents of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol are without prejudice to any decision that the Executive Committee might take following issuance of the document.

COMMENTS AND RECOMMENDATION OF THE FUND SECRETARIAT

1. The World Bank is requesting approval from the Executive Committee of US \$150,000 for its 2015 work programme, plus agency support costs of US \$10,500 listed in Table 1. The submission is attached to the present document.

Table 1: The World Bank's work programme for 2015

Country	Activity/Project	Amount Requested (US \$)	Amount Recommended (US \$)
SECTION A: ACTIVITIES FOR INDIVIDUAL CONSIDERATION			
A1: Project preparation			
Thailand	Project preparation for foam demonstration project	30,000	*
Subtotal for A1		30,000	
Agency support costs (7 per cent for project preparation):		2,100	*
Total for A1		32,100	
A2: Technical Assistance			
Thailand	HFC survey	120,000	*
Subtotal for A2		120,000	
Agency support costs (9 per cent for technical assistance):		10,800	*
Total for A2		130,800	
Grand Total (A1 and A2)		162,900	

*Project for individual consideration

SECTION A: ACTIVITIES FOR INDIVIDUAL CONSIDERATION

A1: Project preparation for projects to demonstrate climate-friendly and energy-efficient alternative technologies to HCFCs

Thailand: project preparation for foam demonstration project (US \$30,000)

Project description

2. The World Bank has submitted a request for funding for the preparation of project that would demonstrate climate-friendly and energy-efficient alternative technologies to HCFCs for a foam system house in Thailand. This project was submitted in line with decision 72/40.

3. The project preparation request included information on the concept of the project; the activities to be undertaken during project preparation and associated costs; and an estimate of the total cost of the resulting demonstration project. The project preparation request was submitted with an endorsement letter from the Government of Thailand. The details of the request are contained in Annex I to the present document.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

Secretariat's comments

4. 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 HCFCs¹ under agenda item 10, the Executive Committee decided *inter alia* to consider at its 75th and 76th meetings proposals for demonstration projects for GWP alternatives to HCFCs within the framework established, and provided criteria for such projects (decision 72/40).

¹ UNEP/OzL.Pro/ExCom/72/40.

5. 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 Fund². Further to discussions, additional guidance was also provided in order to ensure that the best proposals for demonstration projects were submitted³.

6. 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 review⁴.

Secretariat's recommendation

7. The Executive Committee may wish to:

- (a) Consider the proposal for the preparation of a project in the foam sector in Thailand that would demonstrate climate-friendly and energy-efficient alternative technologies to HCFCs, 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
- (b) Approve the project preparation request mentioned in sub-paragraph (a) above, in case the Executive Committee selects this proposal.

A2: Technical assistance for preparation for ODS surveys

Thailand: preparation of national HFC survey (US \$120,000)

Project description

8. The World Bank has submitted a funding request to conduct a national survey on alternatives to ODS for Thailand in response to paragraph 4 of decision XXVI/9⁵.

9. The objective of the surveys would be to assist an Article 5 country to better understand its consumption trends for non-ODS alternatives, and their distribution by sector and subsector. The inventories on ODS alternatives may also provide the countries with an overview of their national markets where ODS alternatives have been (and will be) phased in, while taking into consideration existing technologies. The surveys will estimate the amounts of each ODS alternative currently used in the country, identify alternatives that could be potentially used in the future to replace HCFCs and HFCs; and forecast the amounts of each of the ODS alternatives currently used and potentially to be used in the country for the 2015-2030 period.

² UNEP/OzL.Pro/ExCom/73/18.

³ The suggestions made by Executive Committee members are contained in paragraph 97 of document UNEP/OzL.Pro/ExCom/73/62.

⁴ UNEP/OzL.Pro/ExCom/74/13.

⁵ The Parties to the Montreal Protocol decided inter alia "to request the Executive Committee of the Multilateral Fund to consider providing additional funding to conduct inventories or surveys on alternatives to ozone-depleting substances in interested parties operating under paragraph 1 of Article 5 upon their request".

Secretariat's comments

10. In response to the request by the Parties to the Executive Committee in paragraph 4 of decision XXVI/9, the Secretariat has prepared document UNEP/OzL.Pro/ExCom/74/53, presenting the text of decision and seeking guidance from the Executive Committee on how to address this request from the Meeting of the Parties. Attached to the above-mentioned document is a "Note from the Secretariat" which contains information on the matter of providing additional funding to conduct inventories or surveys on ODS alternatives in interested Article 5 countries.

11. As the Executive Committee has not decided on how to address the request by the Parties, the Secretariat has not reviewed the requests on surveys on ODS alternatives submitted by Article 5 countries. In its deliberations, the Executive Committee may wish to note that the requests for surveys were not included in the 2015-2017 business plan of World Bank, and are not required to meet or accelerate the HCFC compliance needs of Article 5 countries.

Secretariat's recommendation

12. The Executive Committee may wish to consider the request to conduct a national HFC survey in Thailand in the context of its discussion on agenda item 12 on follow-up to decision XXVI/9 (paragraph 4) of the Twenty-sixth Meeting of the Parties on additional funding to conduct inventories or surveys on ODS alternatives.

2015 BUSINESS PLAN
WORK PROGRAM AMENDMENT



WORLD BANK GROUP

WORLD BANK IMPLEMENTED
MONTREAL PROTOCOL OPERATIONS

Presented to the
74th Meeting of the Executive Committee
of the Multilateral Fund

23 March 2015

WORK PROGRAM FOR WORLD-BANK IMPLEMENTED MONTREAL PROTOCOL OPERATIONS

1. This proposed work program amendment for Bank-Implemented Montreal Protocol Operations is prepared on the basis of the 2015-2017 World Bank Business Plan which was approved by the Executive Committee at its 73rd meeting.
2. The 2015-2017 World Bank Business Plan consists of investment and non-investment activities to assist Article 5 partner countries to meet their two HCFC reduction targets, the 2015 10% reduction and the 2020 35% reduction. The Business Plan includes, in addition to deliverables associated with previously approved and new investment activities, requests to extend support for implementation of existing institutional strengthening projects in 2 countries.
3. As part of the 2015-2017 Business Plan, the World Bank plans to submit new preparation fund requests for HCFC sector plans Stage II for Argentina, Jordan, and Thailand, including foam demonstration project for Thailand, and project proposals for Argentina, China, Indonesia, Jordan, the Philippines, Thailand and Vietnam.

2015 Work Program – ExCom 74 Amendment

4. The proposed 2015 Work Program Amendment being submitted for consideration at the 74th Meeting of the Executive Committee, includes funding requests for two preparation activities, outlined in Table 1 below. Detailed explanation on Thailand’s request for foam demonstration project is described in **Error! Reference source not found.**

Table 1: Funding Requests Submitted for Consideration by the 74th Meeting of the Executive Committee

Country	Request (US\$)	Support costs (US\$)	Duration	Description
Thailand	30,000	2,100	1 year	Project preparation for foam demonstration project in Thailand in accordance with decision 72/40.
Thailand	120,000	10,800	1 year	Preparation HFC survey for Thailand in accordance with decision XXVI/9.
Total	150,000	12,900		

Annex 1: Request for Project Preparation Funding and Approval of Project Concept Demonstration Project on Low-GWP Alternatives for Foam System House in Thailand

I. Introduction

According to Thailand HPMP Stage I, a total quantity of HCFC-141b used in bulk, in domestically pre-blended and imported pre-blended polyol, of 1,517 MT will be phased out. Of which, 639.6 MT of HCFC-141b will be replaced by cyclo-pentane and 844.6 MT of HCFC-141b will be replaced by a 50% reduced formulation with HFC-245fa as a blowing agent. The balance will be phased out by water blown technology. Thailand HPMP Stage I does not include spray foam application which consumed 349.1 MT of HCFC-141b in 2010.

The foam companies expected to convert to HFC-245fa are mainly small and micro-sized enterprises. These enterprises frequently use pre-blended polyol formulations containing HCFC-141b in their manufacturing processes. While these enterprises wish to emulate the larger players in terms of using hydrocarbons, they would have to opt for non-flammable blowing agent since the investment costs are too prohibitive and their locations may be against local regulations prohibiting the use of flammable gas.

However, such alternatives are much more costly to use than HCFC-141b and hydrocarbons. Even the water blown technology, the increased density will make the cost of making a unit of foam become more expensive. Thus, it will be difficult to convince these enterprises to stop using HCFC-141b. To make it more financially viable is to reduce the quantity required. Based on the preliminary work of World Bank's OORG, the amount of HFC-245fa used as blowing agent could be reduced to only 30% of the amount of HCFC-141b. Because of the lower amount of HFC-245fa is needed in comparison with HCFC-141b, the cost of production of a unit of foam with HFC-245fa increases less than 10% when comparing with foam produced with HCFC-141b.

Due to low boiling point, polyol pre-blended with HFC-245fa needs to be kept at low temperature in order to prevent separation. Furthermore, its high GWP and increasing international momentum to phase-down HFCs, HFC-245fa should be considered only as a transitional alternative. With the commercial production of low-GWP blowing agents such as HFO-1233zd(E) (Honeywell Solstice® Liquid Blowing Agent), and HFO-1336mzzz(Z) (DuPont Formacel® 1100), these alternatives could provide a long-term solution for rigid PU foam applications as well as for spray foam. Moreover, the new alternative HFO-1336 mzzz(Z) has a higher boiling point and it could be more practical for Thailand and the region due to its climate condition.

This project would demonstrate the technical and economic viability of using low-GWP alternatives foam formulation in selected PU foam and spray foam applications. The idea is to make the final cost of making a unit of foam remains at the same or slightly higher level in order to make it competitive in comparison with HCFC-141b. Moreover, this would make the replacement of HCFC-141b in the spray foam possible and less costly. The attempt on reduced formulation has not been done in Thailand or other places with similar climatic conditions. Once proven the technical and economic viability, it could be replicated to cover the spray foam under stage II. However, enterprises under stage I that is converting to reduced HFC-245fa formulation in PU application could benefit from this demonstration project as the competitive price of reduced formulation will help sustain the phase-out in small enterprises. These would cover approximately 1,193.7 MT of HCFC-141b that could potentially convert to low-GWP alternatives instead of HFC-245fa. Experiences from Thailand would also be share with other countries in the region with similar operating conditions.

II. Brief project summary

The project will be addressing two segments: (i) small enterprises in all applications, except spray foam; and (ii) spray foam. The project consists of two main components. The first component is the technical assistance that will be made available to all system houses and polyol suppliers. Foam system houses and polyol suppliers will be given support in the form of access to experts and suppliers of alternative technologies to bring them up to speed on short and longer term options for a sector characterized by small users with capacity limitations. The technical assistance will transfer knowledge and strengthen technical capacity of the system house in formulation development. Foam properties depend on the interaction of all components: polyols, blowing agents, surfactants, catalysts, and isocyanate. There is no direct correlation between foam and substance properties and, as such, there is no “drop-in” replacement for blowing agent. The technical assistance will provide knowhow and tools in formulating new foam formulation using low-GWP alternatives that would be suitable to the operating and climatic conditions in Thailand.

The second component will provide cost of equipment or modification of existing equipment to participating system houses. The equipment may include the followings: mixing unit, foaming equipment, and safety equipment, if necessary. The participating system houses will also receive cost of developing new formulation and cost of raw materials for the trial production and testing that they will develop with their customers.

III. Project objectives

- To make supply of cost-effective low-GWP pre-blended polyol become commercially available by increasing technical capacity of system houses in formulation development using low-GWP alternatives;
- To strengthen capacity of selected local system houses to formulate, test, and produce pre-blended polyol using low-GWP alternatives; and
- To determine and demonstrate the effectiveness and cost of low-GWP alternatives in PU foam applications including spray foam.

IV. Expected demonstration results

The outcome of the demonstration project is the production of foam meeting required performance standards. The project will produce information related to the foam formulation using low-GWP alternatives:

- Changes/adjustments made on the foam formulation and effects on foam properties;
- Pre-blended foam: insulation, shelf life, percentage of blowing agent, polyol/isocyanate ratio, etc.
- Cost of foam produced with low-GWP alternatives covered by the demonstration project; and
- Modification and changes at the system house and at the foam enterprise.

V. Institutional arrangements

- a. Brief information on legal and regulatory support for the demonstration project

In January 2013, DIW established an import quota system for each HCFC. Terms and conditions for eligible importers, procedures for establishing the overall annual import quota for each HCFC as well as import quotas for each eligible importer, were agreed to by all registered importers. These terms and conditions were then published in DIW’s official website. The overall annual import quota was established on the basis of the consumption target defined by the agreement between Thailand and the ExCom and by Thailand’s obligation under the Montreal Protocol. Import quota for each individual eligible importer is determined on the basis of its historical import data. Import quotas are valid only one calendar year. This system has been used since 2013. The latest import quotas for all eligible importers

were issued in January 2015. According to Thailand HPMP stage I, The government of Thailand plans to ban the use of HCFC-141b in foam manufacturing and the import of pre-blended polyol containing HCFC-141b starting January 1, 2016, except in spray foam uses.

b. Description of implementation approach

To transfer technology on formulation development to the system houses and distributors, international expert will conduct technical workshops to transfer knowledge and strengthen technical capacity of the system houses in formulation development. There will also be another workshop to share the results from the testing of foam formulations using low-GWP alternatives.

There are 215 foam manufacturing enterprises across Thailand using HCFC-141b. The majority uses pre-blended polyol that is supplied by the different polyol suppliers. Out of the 215 enterprises, 53 have a consumption of less than 1 ODP MT of HCFC-141b and can consequently be considered as “micro-enterprises.” To reach these small and micro-sized enterprises, the project will provide foaming equipment to the participating local system houses and assist in developing and supplying pre-blended polyol using low-GWP alternatives to PU foam applications and spray foam to their customers.

c. Government commitment to complete project in 12 months

The Government plans to ban the use of HCFC-141b in foam manufacturing and the import of pre-blended polyol containing HCFC-141b starting January 1, 2016, thus it is crucial that this demonstration project is completed as soon as possible so the small and micro-enterprises could prevent second conversion from using high-GWP HFC-245fa and switch to low-GWP alternatives. Experience gained from this demonstration project will be incorporated in the design of Stage II HPMP which complete phase-out of HCFC-141b in the foam sector will be a priority.

d. Project preparation activities

Description of activities	Unit cost (\$)	No. of units	Cost
International consultant	500/day	10 days	5,000
International travel	7,500/trip	2	15,000
Site visits to system houses and foam enterprises	500/day	10	5,000
Workshop with national stakeholders	5,000	1	5,000
Total project preparation cost (US \$)			30,000

e. Estimated project cost

According to the World Bank 2015-2017 Business Plan, the overall costs of implementing the Thai foam demonstration project is estimated at \$1,046,100. The cost will be finalized during project preparation.

VI. Company Information

a. Company commitment

The following system houses/distributor have committed to participate in the demonstration project:

- i. Bangkok Integrated Trading, Co., Ltd.
- ii. CB Marketing Col, Ltd.; and
- iii. South City Polychem, Co., Ltd.