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EXECUTIVE COMMITTEE OF  
THE MULTILATERAL FUND FOR THE  
IMPLEMENTATION OF THE MONTREAL PROTOCOL  
Seventy-first Meeting  
Montreal, 2-6 December 2013

**PROJECT PROPOSAL: MEXICO**

This document consists of the comments and recommendation of the Fund Secretariat on the following project proposal:

Phase-out

- HCFC phase-out management plan (stage I, third tranche)

UNIDO/UNDP

## PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

## Mexico

(I) PROJECT TITLE	AGENCY
HCFC phase out plan (Stage I)	UNIDO (lead), UNDP

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2012	1,103.98 (ODP tonnes)
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(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)								Year: 2012	
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab Use	Total sector consumption
				Manufacturing	Servicing				
HCFC-123					0.7				0.7
HCFC-124					0.6				0.6
HCFC-141b	32.5	382.6		218.9					634.0
HCFC-141b in Imported Pre-blended Polyol									
HCFC-142b		47.2							47.2
HCFC-22	20.9	27.0		50.6	310.1				408.5

(IV) CONSUMPTION DATA (ODP tonnes)			
2009 - 2010 baseline:	1,148.8	Starting point for sustained aggregate reductions:	1,214.8
CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)			
Already approved:	417.3	Remaining:	797.5

(V) BUSINESS PLAN		2013	2014	2015	Total
UNIDO	ODS phase-out (ODP tonnes)	13.4	2.8	5.3	21.5
	Funding (US \$)	621,717	129,000	243,291	994,008
UNDP	ODS phase-out (ODP tonnes)	88.1	0.0	26.0	114.1
	Funding (US \$)	4,085,000	0	1,206,691	5,291,691

(VI) PROJECT DATA			2009	2011	2012	2013	2014	2015	2018	Total
Montreal Protocol consumption limits			n/a	n/a	n/a	1,148.8	1,148.8	1,033.9	1,033.9	n/a
Maximum allowable consumption (ODP tonnes)			n/a	n/a	n/a	1,148.8	1,148.8	1,033.9	804.2	n/a
Agreed Funding (US\$)	UNIDO (lead agency)	Project costs	0	2,792,526	695,011	578,341	120,000	226,317	0	4,412,195
		Support costs	0	209,439	52,126	43,376	9,000	16,974	0	330,915
	UNDP	Project costs	2,428,987	2,502,526	3,800,000	3,800,000	0	1,122,503	0	13,654,016
		Support costs	182,174	187,689	285,000	285,000	0	84,188	0	1,024,051
Funds approved by ExCom (US\$)	Project Costs	2,428,987	5,295,052	4,495,011	0	0	0	0	12,219,050	
	Support Costs	182,174	397,128	337,126	0	0	0	0	916,428	
Total funds requested for approval at this meeting (US\$)	Project Costs	0	0	0	4,378,341	0	0	0	4,378,341	
	Support Costs	0	0	0	328,376	0	0	0	328,376	

<b>Secretariat's recommendation:</b>	Blanket approval
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## PROJECT DESCRIPTION

1. On behalf of the Government of Mexico UNIDO, as the lead implementing agency, has submitted to the 71<sup>st</sup> meeting a request for funding for the third tranche of stage I of the HCFC phase-out management plan (HPMP)<sup>1</sup> at a total cost of US \$4,706,717, consisting of US \$578,341, plus agency support costs of US \$43,376 for UNIDO, and US \$3,800,000, plus agency support costs of US \$285,000 for UNDP. The submission includes a progress report on the implementation of the second year of the HPMP, together with the tranche implementation plan for the remainder of 2013 and 2014.

### Progress report on the implementation of the second tranche of the HPMP

2. Stage I of the HPMP for Mexico includes the phase-out of HCFCs in the foam and aerosol manufacturing sector and in the refrigeration servicing sector. The results achieved so far are described below.

#### *Activities in the foam manufacturing sector*

3. Domestic refrigeration (Mabe): Bidding process for equipment required was completed and the contract was signed with the equipment supplier. A delay in the delivery of equipment occurred as the specifications needed modifications due to a change in the type of polyol to be supplied. All equipment will be delivered by early 2014 and the project will be completed by the end of 2014, resulting in the phase out of 55.9 ODP tonnes of HCFC-141b.

4. Systems houses: All new non-HCFC pre-blended polyol formulations have been developed and are currently being tested at selected downstream-users' facilities to assess medium and long term performance. Several systems houses have already installed the equipment and safety related items as per the signed agreements. The equipment required for the introduction of the new polyol formulations for the downstream foam enterprises will be provided according to the technology developed by the supplier systems house. Activities implemented at each systems house are detailed in Table 1 below:

**Table 1. Summary of activities implemented by the systems houses**

Systems house	Activities implemented
Acsa	Production line reconversion completed. HCFC-free formulations developed at the laboratory level. Field optimization is taking place at clients' level for approval. Clients' reconversion will begin.
Aepsa	Industrial reconversion completed and methyl formate (MF) pre-blended systems approved. Initial batches with MF polyol are being sprayed by selected clients for further optimization. As soon as comparative results from those applications are ready, MF formulations will be commercially available.
Bayer*	HFC-based (further HFO when available) systems are commercially available. Company is surveying clients that will begin the reconversion by first quarter of 2014 (self-funded).
Comsisa	MF-based systems fully developed, tested and approved at the laboratory level. Physical adaptation of the plant completed. Blenders are at the final stage of adaptation. The company is testing MF system at selected end-users (for field application adjustment of the dispensers). Procurement of hoses, pumps and spare parts for spray machines initiated at selected clients for test.
Dow*	Company is initiating testing both with HFC-based (further HFO when available) and water-blown systems at client level to identify issues during implementation at client level (self-funded).

<sup>1</sup> The HPMP for Mexico was approved by the Executive Committee at its 64<sup>th</sup> meeting to meet the 30 per cent reduction in HCFC consumption by 1 January 2018.

<b>Systems house</b>	<b>Activities implemented</b>
Eiffel	Industrial reconversion completed. MF-based systems approved and commercially available. Company is evaluating whether further optimization will be needed. Baseline equipment evaluation at end-user level is on-going to determine changes required for the use of the MF-based systems. Methylal and water-blown systems are at the final stages of optimization at the laboratory level.
Huntsman*	Company is testing water-blown systems at the client level to define implementation schedule (self-funded).
Maxima	MF-based formulations fully developed and approved at the laboratory level. Production line reconversion is progressing. Explosion-proof motors and safety installations (including ventilation) procured and at the final stages of installation. Audit expected between November/December so that first batches can be produced and shipped for testing and optimization at client level in early 2014.
Polioloes	HFC-based and water-blown based systems developed and ready for commercialization. HFO-based systems will replace current HFC-system and will be available at a later stage (development to be undertake at own costs). MF-based systems being optimized at the laboratory level. Company is preparing the industrial reconversion plan and carrying out initial biddings to estimate the level of co-funding.
Pumex	Reconversion completed. Final work related to underground storage tank and piping being completed. Methylal-based and MF-based formulations developed at the laboratory level. Field optimization will take place during 2014 at the clients' level.
Urethane of Mexico	MF technology selected and transferred. Company finalizing the laboratory optimization of formulas to proceed with field applications by the second quarter of 2014.
Zadro	Production line fully reconverted and a safety audit is expected by the end of 2013. Methylal-based and MF-based formulations approved at the laboratory level and available for end-users. Company is verifying baseline data of its client's production equipment so the bid for the retrofitting kit can take place. Client's test and field optimization expected by mid-2014.
Valcom	MF-based formulations fully developed and approved at the laboratory level. Field tests at clients' level on-going so production optimization can take place based on long term results.

\* Foreign-owned, not eligible for funding.

5. Commercial refrigeration (Fersa, Frigopanel, Metalfrio): Contract signing with the equipment supplier for Metalfrio took longer than expected, however the equipment is expected to be delivered to the enterprise in December 2013 and the project will be completed in 2014 with an estimated phase out of 9.2 ODP tonnes of HCFC-141b. UNIDO visited Fersa and Frigopanel to discuss previously reported issues on the selection of the technology, associated costs and technical requirements for implementation. Both companies confirmed their decision to convert to cyclopentane technology. Frigopanel completed the terms of reference and bidding process, and is currently confirming co-financing as equipment values ended up being higher than expected. Fersa completed the terms of reference on August 2013 and started the bidding process on September 2013. Both enterprises expect to issue purchase orders in December 2013, have the equipment delivered in September 2014 and have it installed by the end of 2014. Both projects are expected to be completed in 2015 with an estimated phase-out of 13.7 ODP tonnes of HCFC-141b.

#### *Activities in the aerosol manufacturing sector*

6. The conversion of Silimex continues to be on track. The procured equipment, including a complete aerosol filling station, was delivered in July 2013. Conversion of facilities has been finalized, trial runs are starting and employee training will be conducted in the last quarter of 2013. HCFC-free formulations have been developed, and some of those that do not require hydrocarbon-based propellants

are already being distributed on the market. The project will be completed in 2014 with an estimated phase out of 11.0 ODP tonnes of HCFC-22 and HCFC-141b.

*Activities in the refrigeration servicing sector*

7. There are several on-going activities in the refrigeration and air-conditioning servicing sector. Twenty training centres have been equipped (e.g., recovery units, recovery tanks, vacuum pumps, leak detectors, flushing machines and other required materials for training), and 60 trainers have received an update on refrigeration servicing. A training manual on good practices in the cleaning of refrigeration and air-conditioning systems, and on substitutes for HCFCs is being prepared. The new manual for technicians on good maintenance practices, which is the basis for servicing-sector training activities, was finalized in Spanish and English and 4,000 copies are being printed. Technical specifications for equipment procurement have been prepared and agreed with the Government, and shipping is expected in November 2013. Several awareness-raising meetings with stakeholders, the servicing sector and training centres have been organized.

*Project coordination and monitoring*

8. The Government of Mexico has taken a series of actions to control HCFC import levels and production. Several meetings held with importers culminated in establishing quotas per company and per chemical on the basis of the average imports for 2009-2010. Thirty custom officers received training on methods to prevent illegal trade. The terms of reference for the verification of HCFC-22 production have been completed, and 2013 production will be verified in early 2014. Furthermore, meetings with the air-conditioning and home appliance manufacturers' association to monitor the energy standard revealed that the recertification of appliances and the slow movement of stocks have not made it possible to replace the old HCFC-based equipment with new, efficient equipment. Monitoring will continue.

Status of fund disbursement

9. As of June 2013, of the US \$12,219,050 approved for the first two tranches, US \$5,853,046 (47 per cent) had been disbursed. The balance of US \$6,366,004 will be disbursed in 2014 and 2015 (Table 2).

**Table 2. Financial report associated with the first two tranches of the HPMP for Mexico**

Description	Funds (US \$)		
	Approved	Disbursed	Balance
Mabe foam project	2,428,987	1,977,500	451,487
Silimex aerosol project	520,916	335,265	185,651
Three commercial refrigeration	2,046,110	747,605	1,298,505
Systems houses	6,302,526	2,302,345	4,000,181
Servicing sector and Project monitoring	920,511	490,331	430,180
Total	12,219,050	5,853,046	6,366,004

Annual plans for the third tranche of the HPMP

10. The main activities to be implemented for the remainder of 2013 and 2014 are described below:
- (a) Complete equipment installation and trials by the second quarter of 2014 for Mabe, and start the industrial production of appliances, with completion of the project by the end of 2014;

- (b) Complete conversion of all national systems houses and achieve an advanced stage of implementation by downstream foam enterprises;
- (c) Phase out HCFC-141b and start industrial production of new appliances at Metalfrío by the end of 2014; deliver and install new equipment to Fersa and Frigopanel by the end of 2014;
- (d) Complete the installation of equipment and safety systems for Silimex and start the production of new aerosol products by the second quarter of 2014;
- (e) Give upgrade training to 80 trainers and train 1,000 technicians in good refrigeration practices, equip 11 training centres, order basic service equipment and tools for an additional nine centres; and
- (f) Ensure compliance with the Montreal Protocol control measures and the Agreement targets through controls on imports and production levels, including the prevention of illegal trade.

### SECRETARIAT'S COMMENTS AND RECOMMENDATION

#### COMMENTS

##### Operational licensing system

11. The Government of Mexico has already issued HCFC import quotas of 1,141.14 ODP tonnes for 2013 and 2014, as shown in Table 3. The quota for each year is 7.65 ODP tonnes below the baseline for compliance.

**Table 3. HCFC quotas for 2013 and 2014**

Quota for year	HCFC-22	HCFC-141b	HCFC-123	HCFC-124	HCFC-142b	Total
<b>Metric tonnes</b>						
2013	8,475.00	6,020.89	65.85	4.50	173.81	14,740.05
2014	8,475.00	6,020.89	65.85	4.50	173.81	14,740.05
<b>ODP tonnes</b>						
2013	466.13	662.30	1.32	0.10	11.30	1,141.14
2014	466.13	662.30	1.32	0.10	11.30	1,141.14

##### HCFC consumption

12. The HCFC consumption reported under Article 7 of the Montreal Protocol for 2007 to 2012 is shown in Table 4. HCFC consumption was 1,103.98 ODP tonnes in 2012, which is already 44.82 ODP tonnes below the allowable level of consumption in 2013.

**Table 4. HCFC consumption in Mexico (Article 7)**

HCFC	2007	2008	2009	2010	2011	2012	Baseline
<b>Metric tonnes</b>							
HCFC-123	50.1	13.9	54.0	92.1	63.29	37	73.1
HCFC-124	46.4	2.7	5.0	10.9	161.30	29.33	8.0
HCFC-141b	6,951.5	7,459.7	5,503.5	6,744.2	6,196.20	5,882.20	6,123.9
HCFC-142b	4.4	16.0	20.0	158.3	437.70	725.53	89.2
HCFC-22	11,958.9	7,142.0	9,419.0	7,591.2	6,704.53	7,425.30	8,505.1
Total (mt)	19,011.2	14,634.3	15,001.5	14,596.7	13,563.0	14,099.36	14,799.1
<b>ODP tonnes</b>							

HCFC	2007	2008	2009	2010	2011	2012	Baseline
HCFC-123	1.0	0.3	1.1	1.8	1.27	0.74	1.5
HCFC-124	1.0	0.1	0.1	0.2	3.55	0.64	0.2
HCFC-141b	764.7	820.6	605.4	741.9	681.58	647.04	673.6
HCFC-142b	0.3	1.0	1.3	10.3	28.45	47.15	5.8
HCFC-22	657.7	392.8	518.0	417.5	368.75	408.39	467.8
Total (ODP tonnes)	1,424.7	1,214.8	1,125.9	1,171.7	1,083.60	1,103.98	1,148.8

13. The increase in the consumption of HCFC-22 in 2012 was due to an increased use in the refrigeration service sector to serve a growing installed capacity, while the substantial increase in the consumption of HCFC-142b was caused by two non-eligible enterprises producing packaging systems for the protection of equipment. It is expected that one of the two companies will be converted by 2018 (or earlier) using their own resources.

#### Issues discussed with the implementing agencies

14. In relation to the assistance provided to downstream users by systems houses, UNDP explained that each systems house is initially working with exclusive clients to avoid commercial disputes which could undermine the reconversion process. Once this phase is completed, and with the gradual introduction of HCFC-free systems (and the decrease in HCFC-based ones), downstream users that have multiple suppliers will be reconverted.

15. The estimated discontinuation of the production of HCFC-based systems by systems houses will depend on the wide commercial availability of alternative systems and downstream adaptation to them. No major issues are expected with regard to the perceived quality of alternative systems and the performance of the HCFC-free technologies being introduced. UNDP further reported that one systems house is already promoting its MF-based systems in the Latin American and Caribbean region, where one enterprise in Jamaica has bought samples to finalize trials under stage I of the HPMP for Jamaica and that five enterprises in Trinidad and Tobago are also negotiating supplies of MF-formulations.

16. With regard to the expected reduction in the use of HCFC-141b as a solvent for cleaning in the refrigeration servicing sector, UNIDO explained that stage I considered only half of the HCFC-141b consumption in the flushing operations. Stage II of the HPMP would include the remaining consumption.

17. In discussing the alternative technologies available on the market and those being promoted in the refrigeration and air-conditioning sector in Mexico, UNIDO indicated that the alternatives are very much dependent on international market requirements. Although there are HFCs in the market, efforts are being made to reduce the use and installation of new capacity based on them. The use of hydrocarbons (HC) in certain sectors will be considered as an option during the implementation of stage II of the HPMP. The main challenge in this regard will be the regulations on the use of HC and the proper techniques to maintain the HC-based equipment.

18. In conclusion, the Secretariat noted significant progress in the implementation of the HPMP in Mexico, with special emphasis on the aerosol and the systems houses projects. UNIDO and UNDP provided additional details on the implementation of the foam projects in the domestic and commercial refrigeration sectors, which showed that emerging contingencies have been addressed, and that projects will be completed by the end of 2014 (Mabe and Metalfrio) and 2015 (Fersa and Frigopanel). Activities in the refrigeration servicing sector continue to progress, and non-investment activities to ensure control of HCFC imports and production have been successfully implemented. HCFC consumption in 2012 and import quotas in 2013 and 2014 are below the baseline.

**RECOMMENDATION**

19. The Fund Secretariat recommends that the Executive Committee takes note of the progress report on the implementation of the second tranche of stage I of the HCFC phase-out management plan (HPMP) in Mexico, and further recommends blanket approval of the third tranche of stage I of the HPMP and the corresponding 2013–2014 tranche implementation plan, with associated support costs at the funding level shown in the table below:

	<b>Project Title</b>	<b>Project funding (US \$)</b>	<b>Support cost (US \$)</b>	<b>Implementing agency</b>
(a)	HCFC phase-out management plan (stage I third tranche)	578,341	43,376	UNIDO
(b)	HCFC phase-out management plan (stage I third tranche)	3,800,000	285,000	UNDP

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