



**United Nations
Environment
Programme**

Distr.
GENERAL

UNEP/OzL.Pro/ExCom/75/54
26 October 2015

ORIGINAL: ENGLISH



EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Seventy-fifth Meeting
Montreal, 16-20 November 2015

PROJECT PROPOSAL: MALAYSIA

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

Phase-out

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

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS
Malaysia

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase out plan (Stage I)	UNDP (lead)	65th	15% by 2016

(II) LATEST ARTICLE 7 DATA (Annex C Group I)	Year: 2014	466.49 (ODP tonnes)
--	------------	---------------------

(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)								Year: 2014	
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab use	Total sector consumption
				Manufacturing	Servicing				
HCFC-123				0.9	1.0				1.8
HCFC-124									
HCFC-141									
HCFC-141b		136.4							136.4
HCFC-142b									
HCFC-21									
HCFC-22				155.1	172.8				328.0
HCFC-225									

(IV) CONSUMPTION DATA (ODP tonnes)			
2009 - 2010 baseline:	515.8	Starting point for sustained aggregate reductions:	515.76
CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)			
Already approved:	103.02	Remaining:	412.74

(V) BUSINESS PLAN		2015	2016	Total
UNDP	ODS phase-out (ODP tonnes)	5.2	5.2	10.3
	Funding (US \$)	515,327	515,327	1,030,654

(VI) PROJECT DATA			2011	2012	2013	2014	2015	2016	Total
Montreal Protocol consumption limits			n/a	n/a	515.76	515.76	464.18	464.18	n/a
Maximum allowable consumption (ODP tonnes)			n/a	n/a	515.76	515.76	464.18	438.40	n/a
Agreed funding (US\$)	UNDP	Project costs	5,000,000	0	3,628,723	0	479,374	479,374	9,587,471
		Support costs	375,000	0	272,154	0	35,953	35,953	719,060
Funds approved by ExCom (US\$)	UNDP	Project costs	5,000,000	0	3,628,723	0	0	0	8,628,723
		Support costs	375,000	0	272,154	0	0	0.0	647,154
Total funds requested for approval at this meeting (US\$)	UNDP	Project costs	0	0	0	0	479,374	479,374	958,748
		Support costs	0	0	0	0	35,953	35,953	71,906

Secretariat's recommendation:	For individual consideration
--------------------------------------	------------------------------

PROJECT DESCRIPTION

1. On behalf of the Government of Malaysia, UNDP as the designated implementing agency, has submitted to the 75th meeting a request for funding for the third and fourth tranches of stage I of the HCFC phase-out management plan (HPMP), at the amount of US \$958,748, plus agency support costs of US \$71,906. The submission includes a progress report on the implementation of the second tranche, the verification report on HCFC consumption and the tranche implementation plan for 2015 to 2016.

Report on HCFC consumption

HCFC consumption

2. The Government of Malaysia reported a consumption of 466.49 ODP tonnes of HCFC in 2014. The 2010-2014 HCFC consumption is shown in Table 1.

Table 1. HCFC consumption in Malaysia (2010-2014 Article 7 data)

HCFC	2010	2011	2012	2013	2014	Baseline
Metric tonnes (mt)						
HCFC-22	6,455.58	6,167.26	7,635.02	5,355.20	5,963.03	6,355.29
HCFC-121	0.00	0.17	0.00	0.00	0.00	0.00
HCFC-123	45.31	33.70	64.29	14.95	91.64	56.65
HCFC-141	26.75	80.0	0.00	0.00	0.00	13.38
HCFC-141b	1,620.21	1,242.06	2,869.16	1,321.10	1,239.97	1,477.61
HCFC-142b	20.00	1.80	0.00	86.74	4.47	12.10
HCFC-225	1.55	1.08	1.18	0.60	0.00	1.11
Total (metric tonnes)	8,169.40	7,526.07	10,569.65	6,778.60	7,299.11	7,934.74
ODP tonnes						
HCFC-22	355.1	339.20	419.92	294.53	327.97	349.60
HCFC-121	0.0	0.01	0.00	0.00	0.00	0.00
HCFC-123	0.9	0.67	1.29	0.30	1.83	1.20
HCFC-141	1.9	5.60	0.00	0.00	0.00	0.90
HCFC-141b	178.2	136.63	315.61	145.32	136.40	162.60
HCFC-142b	1.3	0.12	0.00	5.66	0.29	0.80
HCFC-225	0.1	0.07	0.08	0.04	0.00	0.00
Total (ODP tonnes)	537.5	482.30	736.90	445.83	466.49	515.80

3. In 2012 HCFC consumption increased above the baseline level due to an increase in the demand for polyurethane (PU) foam products, and to procurement practices adopted by the industry in anticipation of the Montreal Protocol control measures. However, in 2013 and 2014 HCFC consumption was already below the baseline level as a result of the conversion of thirteen PU foam enterprises, and control measures taken by the Government to regulate HCFC consumption. The minor growth in HCFC consumption in 2014 was explained by additional imports in anticipation of the 2015 control measure.

Verification report

4. The verification report confirmed that Malaysia is in compliance with the Montreal Protocol control measures, and that the licensing and quota system for HCFC imports and exports is operational and able to ensure compliance. As the total verified consumption values for 2013 (439.51 ODP tonnes) and 2014 (463.40 ODP tonnes) differ slightly from the values reported under Article 7 (Table 1), the verifier suggested that the National Ozone Unit (NOU) request a correction of Article 7 data for 2013 and 2014. This suggestion is currently being considered by the NOU.

Country programme (CP) implementation report

5. The Government of Malaysia reported HCFC sector consumption data under the 2014 CP implementation report which is consistent with the data reported under Article 7.

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

Legal framework

6. The existing licensing and quota system for HCFC import established by the Department of Environment (DOE) was enhanced in 2014 by adding the licensing of HCFC re-exports.

7. A ban on the establishment and expansion of new HCFC-based manufacturing capacities as of 1 January 2013 was issued. DOE is amending the existing regulations to: ensure proper refrigerant handling during servicing and proper disposal of HCFC-based equipment; ban the manufacturing, assembly and importing of HCFC-based air-conditioning with a capacity up to 2.5 HP (currently under review and expected to be enforced in 2016); control the import and use of HCFC as blowing agent and propellant by 2020, and ban the import of HCFC blended polyols by 2016.

PU foam sector

8. By the end of August 2015, all thirteen PU foam manufacturers included in stage I had completed their conversions to cyclopentane technology, resulting in the phase-out of 860 mt (94.6 ODP tonnes) of HCFC-141b.

9. Technical assistance has been provided to four local systems houses for customizing low-global warming potential (GWP) foam formulations for downstream-users. By the end of 2014, all the systems houses had customized at least one low-GWP formulation and shared their experiences in doing so. Two workshops were organized to disseminate information on new technology and policy developments in the foam sector.

Refrigeration and air-conditioning servicing sector

10. A training manual for technicians in the refrigeration and air-conditioning sector in two languages (English and Bahasa Malaysia) was developed. All 82 technicians' trainers were certified as Master Trainers; 41 Authorised Training Centres (ATC) were selected to deliver training; and of 30 recovery units and service tools were procured and distributed to 30 selected ATCs.

11. So far, a total of 1,500 technicians have been trained and certified in the proper handling of refrigerants; and 100 customs officers have been trained. It is expected that between 60 and 80 customs officers will continue receiving training annually. Procurement of 15 refrigerant identifiers has been completed and expected to be handed over to the NOU during the last quarter of 2015.

12. The pilot retrofit/replacement programme to show performance of low-GWP HCFC-22 free technologies for end-users has begun. The programme, implemented in partnership with Daikin¹ as provider of the equipment, has identified two sites to host the demonstration programme.

¹ Daikin, the largest manufacturer of air conditioners in Malaysia, has introduced HFC-32 and HFC-410A air conditioners to replace HCFC-22 air conditioners.

Project implementation and monitoring unit (PMU)

13. The management, coordination and monitoring of the activities planned under the HPMP is undertaken by the NOU.

Level of fund disbursement

14. As of October 2015, of the US \$8,628,723 approved so far, US \$7,863,177 had been disbursed. The balance of US \$765,546 will be disbursed in 2015 and 2016 (Table 2).

Table 2. Financial report of stage I of the HPMP for Malaysia (US \$)

Agency	First tranche		Second tranche		Total approved	
	Approved	Disbursed	Approved	Disbursed	Approved	Disbursed
UNDP	5,000,000	4,854,667	3,628,723	3,008,510	8,628,723	7,863,177
Total	5,000,000	4,854,667	3,628,723	3,008,510	8,628,723	7,863,177
Disbursement rate	97.1 %		82.9 %		91.1%	

Implementation plan for the third and fourth tranches of the HPMP

15. UNDP requested funding for both the third (2015) and fourth tranches (2016) and proposed to undertake the following activities:

- (a) *Refrigeration management*: Printing of the Bahasa Malaysia version of the training manual; completion of the pilot programme on low-GWP technology; training of 200 technicians; procurement and delivery of four mini-reclaim units to established reclaim centers; and update of the technicians' certification programme; and
- (b) *Coordination and management*: New regulations governing HCFC as aerosol propellant and blowing agent to be implemented by the third quarter of 2016; continuation of monitoring activities on imports and exports of HCFCs; and awareness rising activities.

SECRETARIAT'S COMMENTS AND RECOMMENDATION**COMMENTS**Progress report on the implementation of the third tranche of the HPMP*Legal framework*

16. The Government of Malaysia has already issued HCFC import quotas in the amount of 405.00 ODP tonnes for 2015, which is below the Montreal Protocol control target of 464.18 ODP tonnes.

Manufacturing sector

17. Upon a request of information on the status of the demonstration of the new foam formulations developed by each systems house to at least two downstream users (with a consumption of at least 5 mt of HCFC-141b), UNDP indicated that while formulations are showing technically good results, the high price of the alternatives (i.e., HFOs, methyl formate and methylal) for small-and-medium sized enterprises (SMEs) and the need for additional optimization to improve performance (e.g., avoid shrinkage in the case of methyl formate) are delaying their adoption. So far, formulation performance has been tested in one downstream user and demonstrations would continue over the next two to three years. UNDP also explained that alternatives are expected to become more affordable over the next two to four

years, and would be adopted in the market in different applications. A summary of the formulations developed is presented in Table 3.

Table 3. Overview of formulations developed by systems houses in Malaysia

Systems house	Date of Completion	Alternative technology	Application	Result
Systems house 1	22-Apr-14	Methyl formate	PU rigid sandwich panel	Satisfactory
Systems house 1	23-Jun-14	HFO-1233zd	Insulated ice box	Satisfactory
Systems house 3	30-Oct-14	Methylal	PU rigid sandwich panel	Satisfactory
Systems house 4	26-Nov-14	Methyl formate	PU rigid sandwich panel	Satisfactory

Refrigeration and servicing sector

18. With regard to the pilot project for end-users, the Secretariat drew UNDP's attention to the regulatory aspects and liability issues associated with the use of flammable refrigerants in equipment designed for non-flammable substances, including decisions 72/17 and 73/34². UNDP reported that the present project, rather than promoting retrofit, intends to replace around 100 small-size HCFC-22-based air-conditioning units by new HFC-32-based units. The project will be monitored by a UNDP expert, the technology provider (Daikin) and the University of Kuala Lumpur. The monitoring process will define safety related steps needed for installation, operation and servicing of the new HFC-32-based equipment. Retrofit is not under consideration in Malaysia at present as low-GWP efficient retrofit technologies are not available. Retrofits may be considered at a future stage subject to evolution in technology.

Proposal for reallocation of savings from the PU foam sector

19. UNDP provided detailed information on the enterprises' conversions, which resulted in savings of US \$587,952 (i.e., actual cost was US \$6,739,518, instead of the US \$7,327,470 approved in principle). Similarly, implementation of the technical assistance to systems houses resulted in savings of US \$135,000 (i.e., actual cost was US \$835,000 instead of US \$970,000 approved in principle). Savings associated with the projects improved the cost-effectiveness for the PU foam sector plan from US \$9.65/kg to US \$8.81/kg.

20. UNDP indicated the Government of Malaysia's interest in reallocating the US \$722,952 savings from the PU foam project to the existing programme in the refrigeration servicing sector in order to expand the coverage of activities started under stage I (as shown in Table 4), with an associated phase out of 160.45 mt (8.83 ODP tonnes) of HCFC-22. This is a major change in stage I that would need to be considered by the Executive Committee³

Table 4. Plan for reallocation of the fund balance in the foam sector to the refrigeration servicing sector

Activities	Funds (US \$)		Activities proposed
	Original	Proposed	
PU foam enterprises	659,747	71,795	Final payments related to enterprises conversions.
Systems houses	170,000	35,000	Two workshops for SMEs; and support for development of low-cost foam formulation.

² If an assisted country were to decide to proceed with retrofits and associated servicing to flammable and toxic refrigerants in refrigeration and air-conditioning equipment originally designed for non-flammable substances, it would do so assuming all associated responsibilities and risks and only in accordance with the relevant standards and protocols

³ Flexibility clause in paragraph 7(a) of the Agreement.

Activities	Funds (US \$)		Activities proposed
	Original	Proposed	
Refrigeration servicing sector	69000	791,952	Additional 40 training programmes for 800 technicians (US \$260,000); distribution of servicing equipment sets to 100 workshops (US \$300,000); and expansion of the pilot incentive programme for replacement of HCFC-22 equipment with alternatives to industrial and commercial refrigeration (e.g., ammonia-based systems and CO ₂ -based systems) (US \$162,952)
PMU	60,000	60,000	Management and monitoring of activities under stage I
Total	958,747	958,747	

21. Upon a request from the Secretariat, UNDP clarified that only the US \$35,000 being requested for the systems houses component (Table 4) would be required to continue the demonstration of low-GWP technologies to downstream users. The additional activities will be implemented during 2016 along with the activities originally planned for the refrigeration servicing sector. The Secretariat noted that the Government has established under stage I a comprehensive programme for this sector which is being implemented successfully. The additional funding would facilitate the introduction of ammonia and CO₂-based systems, which had not been included in the pilot equipment replacement project. The introduction of these technologies would also assist the implementation of refrigeration servicing sector during stage II.

Revision of the Agreement

22. The amount of funds allocated for each of the third and fourth tranches in the Agreement is US \$479,374. In order to allow implementation of the revised work plan during 2016, UNDP requested the release of the remaining two tranches (US \$958,747) at the 75th meeting. However, in line with decision 62/17, the Secretariat suggested the third tranche in the amount of US \$817,452, and the fourth and last tranche in the amount of US \$141,295 calculated at 10 per cent of the total funding for the refrigeration servicing sector in the Agreement. The revised Agreement reflecting the additional phase-out and the revised funding for the last two tranches is presented in Annex I. The full revised Agreement will be appended to the final report of the 75th meeting.

Conclusion

23. The Secretariat notes that Malaysia has an operational HCFC imports and exports licensing and quota system and is in compliance with the level of consumption required under the Montreal Protocol and its Agreement for stage I for 2013 and 2014. Malaysia has successfully completed the conversion of thirteen PU foam enterprises to cyclopentane with a total associated phase-out of 860 mt (94.6 ODP tonnes) of HCFC-141b, at a lower cost as originally submitted. The four systems houses included in stage I had already developed foam formulations with low-GWP blowing agents and are currently testing them in downstream users. Implementation of this project was also done at a lower cost as originally submitted. The savings of US \$722,952 from the two foam projects will be used for expanding the activities in the refrigeration servicing sector initiated in stage I and will result in an additional reduction of 8.83 ODP tonnes of HCFC consumption based on a revised plan of action for 2016. Based on the above, the third tranche of the HPMP may be considered for approval by the Executive Committee.

RECOMMENDATION

24. The Executive Committee may wish to consider:
- (a) Noting:
 - (i) The progress report on the implementation of the second tranche of stage I of the HCFC phase-out management plan (HPMP) in Malaysia;
 - (ii) With appreciation that the foam sector plan included in stage I of the HPMP had been completed resulting in the phase-out of 94.60 ODP tonnes, and at a lower cost as originally approved, resulting in savings of US \$722,952;
 - (b) Approving the revised work plan for 2016 submitted by the Government of Malaysia, in line with paragraph 7(a) of the Agreement between the Government and the Executive Committee concerning major changes in the use of the approved funds, and revisions to the activities for remaining tranches;
 - (c) Deducting 8.83 ODP tonnes from the remaining eligible consumption of HCFC-22 to be associated with the activities contained in the revised work plan;
 - (d) Noting that the Fund Secretariat had updated Appendix 2-A of the Agreement between the Government of Malaysia and the Executive Committee, based on the additional reduction in HCFC-22 agreed in sub-paragraph (c) above, and that a new paragraph 16 had been added to indicate that the updated Agreement superseded that reached at the 65th meeting, as contained in Annex I to the present document; and
 - (e) Approving the third tranche of stage I of the HPMP for Malaysia, and the corresponding 2016 tranche implementation plan mentioned in sub-paragraph (b) above, at the amount of US \$817,452, plus agency support costs of US \$61,309 for UNDP.

Annex I

TEXT TO BE INCLUDED IN THE UPDATED AGREEMENT BETWEEN THE GOVERNMENT OF MALAYSIA AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS

(Relevant changes are in bold font for ease of reference)

16. The updated Agreement supersedes the Agreement reached between the Government of Malaysia and the Executive Committee at the 65th meeting of the Executive Committee.

APPENDIX 2-A: THE TARGETS, AND FUNDING

Row	Particulars	2011	2012	2013	2014	2015	2016	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	N/A	N/A	515.76	515.76	464.18	464.18	N/A
1.2	Maximum allowable total consumption of Annex C, Group I substances (ODP tonnes)	N/A	N/A	515.18	515.76	464.18	438.40	N/A
2.1	Lead IA UNDP agreed funding (US \$)	5,000,000	0	3,628,723	0	817,452	141,295	9,587,470
2.2	Support costs for Lead IA (US \$)	375,000	0	272,154	0	61,309	10,597	719,060
3.1	Total agreed funding (US \$)	5,000,000	0	3,628,723	0	817,452	141,295	9,587,470
3.2	Total support cost (US \$)	375,000	0	272,154	0	61,309	10,597	719,060
3.3	Total agreed costs (US\$)	5,375,000	0	3,900,877	0	878,761	151,892	10,306,530
4.1.1	Total phase-out of HCFC-123 agreed to be achieved under this Agreement (ODP tonnes)							0
4.1.2	Phase-out of HCFC-123 to be achieved in previously approved projects (ODP tonnes)							0
4.1.3	Remaining eligible consumption for HCFC-123 (ODP tonnes)							1.13
4.2.1	Total phase-out of HCFC-141 agreed to be achieved under this Agreement (ODP tonnes)							0
4.2.2	Phase-out of HCFC-141 to be achieved in previously approved projects (ODP tonnes)							0
4.2.3	Remaining eligible consumption for HCFC-141 (ODP tonnes)							0.94
4.3.1	Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes)							94.60
4.3.2	Phase-out of HCFC-141b to be achieved in previously approved projects (ODP tonnes)							0
4.3.3	Remaining eligible consumption for HCFC-141b (ODP tonnes)							67.94
4.4.1	Total phase-out of HCFC-142b agreed to be achieved under this Agreement (ODP tonnes)							0
4.4.2	Phase-out of HCFC-142b to be achieved in previously approved projects (ODP tonnes)							0
4.4.3	Remaining eligible consumption for HCFC-142b (ODP tonnes)							0.79
4.5.1	Total phase-out of HCFC-21 agreed to be achieved under this Agreement (ODP tonnes)							0
4.5.2	Phase-out of HCFC-21 to be achieved in previously approved projects (ODP tonnes)							0
4.5.3	Remaining eligible consumption for HCFC-21 (ODP tonnes)							0.74
4.6.1	Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes)							17.25
4.6.2	Phase-out of HCFC-22 to be achieved in previously approved projects (ODP tonnes)							0
4.6.3	Remaining eligible consumption for HCFC-22 (ODP tonnes)							332.29
4.7.1	Total phase-out of HCFC-225 agreed to be achieved under this Agreement (ODP tonnes)							0
4.7.2	Phase-out of HCFC-225 to be achieved in previously approved projects (ODP tonnes)							0
4.7.3	Remaining eligible consumption for HCFC-225 (ODP tonnes)							0.08