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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Sixty-fifth Meeting
Bali, Indonesia, 13-17 November 2011

PROJECT PROPOSAL: MALAYSIA

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, first tranche) UNDP

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

Malaysia

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

(II) LATEST ARTICLE 7 DATA	Year: 2010	537.5 (ODP tonnes)

(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)								Year: 2010	
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab Use	Total sector consumption
				Manufacturing	Servicing				
HCFC123				0.8	0.1				0.9
HCFC124									
HCFC141b		178.2							178.2
HCFC141		1.9							1.9
HCFC142b		1.3							1.3
HCFC22				319.6	35.6				355.1
HCFC225				0.1					0.1

(IV) CONSUMPTION DATA (ODP tonnes)			
2009 - 2010 baseline: (estimate)	515.8	Starting point for sustained aggregate reductions:	515.8
CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)			
Already approved:	0.0	Remaining:	412.7

(V) BUSINESS PLAN		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
UNDP	ODS phase-out (ODP tonnes)	12.4	12.4	12.4	4.1	0.0	0.0	0.0	0.0	0.0	0.0	41.5
	Funding (US $)	2,876,669	3,876,669	2,876,669	958,890	0	0	0	0	0	0	10,588,895

(VI) PROJECT DATA			2011	2012	2013	2014	2015	Total
Montreal Protocol consumption limits			N/A	N/A	515.8	515.8	464.2	N/A
Maximum allowable consumption (ODP tonnes)			N/A	N/A	515.8	515.8	464.2	N/A
Project Costs requested in principle(US$)	UNDP	Project costs	5,000,000		3,628,723		958,747	9,587,470
		Support costs	375,000		272,154		71,906	719,060
Total project costs requested in principle (US $)			5,000,000		3,628,723		958,747	9,587,470
Total support costs requested in principle (US $)			375,000		272,154		71,906	719,060
Total funds requested in principle (US $)			5,375,000		3,900,877		1,030,653	10,306,530

(VII) Request for funding for the first tranche (2011)		
Agency	**Funds requested (US $)**	**Support costs (US $)**
UNDP	5,000,000	375,000

Funding request:	Approval of funding for the first tranche (2011) as indicated above
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 65th meeting of the Executive Committee stage I of the HCFC phase-out management plan (HPMP) at a total cost of US $10,552,870 plus agency support costs of US $791,465, as originally submitted. The HPMP covers strategies and activities to achieve 10 per cent reduction in HCFC consumption.

2. The first tranche for stage I of the HPMP being requested at this meeting amounts to US $5,500,000 plus agency support costs of US $412,500 for UNDP, as originally submitted.

Background

3. Malaysia, with a total population of about 25.5 million inhabitants, has ratified all the amendments to the Montreal Protocol.

ODS policy and regulatory framework

4. The Ozone Protection Unit (OPU) within the Department of Environment is responsible for the implementation of the Montreal Protocol in Malaysia. The OPU is also the Secretariat to the National Steering Committee for the Protection of the Ozone Layer, an advisory body to the Government for the implementation of the Montreal Protocol.

5. The Government of Malaysia has formulated policies and regulations to control the import, installation, use and disposal of ozone depleting substances (ODS), and to promote ozone friendly technologies. The Application Import Permit System (AP System) promulgated in 1994 requests all importers of ODS to obtain a permit issued by the Ministry of Trade and Industry (MITI). Although HCFCs have not been included in the AP system as the annual import quotas have yet to be set, a permit is required for importing HCFCs. The AP system for HCFCs is expected to be enforced by 1 January 2013 as part of the implementation of the HPMP.

HCFC consumption and sector distribution

6. All HCFCs used in Malaysia are brought in by approximately 25 importers. No production, exports or feedstock uses of HCFCs were recorded in 2009. In the past five years HCFC consumption in Malaysia has grown at a relatively steady rate of 8 per cent annually due mostly to sustained economic development and the resulting increased demand for HCFC-based equipment, especially small air-cooled split and packaged units (i.e., capacity up to 2.5 HP). The only reduction in HCFC consumption in recent years took place in 2008 as a result of the global economic downturn; however the growing consumption trend resumed in 2009 and is expected to continue beyond 2010. The HCFC baseline for compliance has been estimated at 515.76 ODP tonnes. Table 1 shows the consumption of HCFCs in Malaysia between 2005 and 2010.

Table 1: 2005-2010 HCFC consumption in Malaysia

HCFC	2005	2006	2007	2008	2009	2010	Baseline
Metric tonnes (mt)							
HCFC-22	4,553.00	4,562.00	4,911.00	4,471.00	6,255.00	6,455.58	**6,355.29**
HCFC-141b	899.00	1,153.00	1,280.00	1,206.00	1,335.00	1,620.21	**1,477.61**
HCFC-123	60.00	25.00	54.00	106.00	68.00	45.31	**56.65**
HCFC-141	4.70	0.00	0.00	0.00	0.00	26.75	**13.38**
HCFC-142b	107.93	72.50	14.78	35.56	4.20	20.00	**12.10**

HCFC	2005	2006	2007	2008	2009	2010	Baseline
HCFC-21	28.86	1.35	0.00	5.80	37.20	0.00	**18.60**
HCFC-225	12.63	5.38	4.70	3.40	0.67	1.55	**1.11**
HCFC-121	0.90	6.80	0.00	0.00	0.00	0.00	**0.00**
HCFC-124	0.00	0.05	20.13	0.00	0.00	0.00	**0.00**
TOTAL	**5,667.02**	**5,826.08**	**6,284.61**	**5,827.76**	**7,700.07**	**8,169.40**	**7,934.73**
ODP tonnes							
HCFC-22	250.42	250.91	270.11	245.91	344.03	355.06	**349.54**
HCFC-141b	98.89	126.83	140.80	132.66	146.85	178.22	**162.54**
HCFC-123	1.20	0.50	1.08	2.12	1.36	0.91	**1.13**
HCFC-141	0.33	0.00	0.00	0.00	0.00	1.87	**0.94**
HCFC-142b	7.02	4.71	0.96	2.31	0.27	1.30	**0.79**
HCFC-21	1.15	0.05	0.00	0.23	1.49	0.00	**0.74**
HCFC-225	0.88	0.38	0.33	0.24	0.05	0.11	**0.08**
HCFC-121	0.04	0.27	0.00	0.00	0.00	0.00	**0.00**
HCFC-124	0.00	0.00	0.44	0.00	0.00	0.00	**0.00**
TOTAL	**359.92**	**383.66**	**413.72**	**383.47**	**494.04**	**537.47**	**515.76**

Source: *Data reported under Article 7.*

7. HCFCs are used in Malaysia in the manufacturing of products and equipment in several sectors (47.3 per cent measured in mt or 54.9 per cent measured in ODP tonnes) and in the refrigeration and air-conditioning (RAC) servicing sector (52.7 per cent measured in mt or 45.1 per cent measured in ODP tonnes). About 60-70 per cent of the consumption in manufacturing originates from organized enterprises with good technical and managerial capabilities; and the remaining from small and medium-sized enterprises (SMEs). The predominant substance is HCFC-22 used mainly in the RAC manufacturing and servicing sectors, followed by HCFC-141b used in the polyurethane (PU) foam manufacturing sector. Small amounts of HCFCs are also used in the manufacturing of extruded polystyrene (XPS) foam and in the firefighting and solvents sectors. The sectoral distribution of HCFC consumption in Malaysia is presented in Table 2.

Table 2: Sectoral distribution of HCFC consumption in Malaysia (2009)

Sector	HCFC-22	HCFC-141b	Others (*)	Total	Percentage
Metric tonnes					
Manufacturing					
PU foams		1,335		1,335	17.3%
Air-conditioning	1,915		21	1,936	25.1%
Refrigeration	330		20	350	4.5%
Fire fighting			13	13	0.2%
XPS foams	6		4	10	0.2%
Solvents			1	1	0.0%
Servicing	4,004		51	4,055	52.7%
TOTAL (mt)	**6,255**	**1,335**	**110**	**7,700**	**100%**
ODP tonnes					
Manufacturing					
PU foams		146.85		146.85	29.7%
Air-conditioning	105.33		0.01	105.34	21.3%
Refrigeration	18.15			18.15	3.7%
Fire fighting			0.26	0.26	0.1%
XPS foams	0.33		0.27	0.60	0.1%

Sector	HCFC-22	HCFC-141b	Others (*)	Total	Percentage
Solvents			0.05	0.05	0.0%
Servicing	220.22		2.58	222.80	45.1%
TOTAL (mt)	**344.03**	**146.85**	**3.17**	**494.04**	**100%**

(*) HCFC-21, HCFC-123, HCFC-142b, HCFC-225

Air- conditioning and refrigeration manufacturing sectors

8. The air-conditioning manufacturing sector in Malaysia is divided into five subsectors: air-cooled split and packaged units, water-cooled packaged units, heat pumps, direct-expansion chillers and flooded chillers (centrifugal chillers). The manufacturing of air-cooled split and packaged units consumes 1,750 mt (96.25 ODP tonnes) which corresponds to 91 per cent of the HCFC-22 used in this sector, although most of these units are of small capacity (2.5 HP rating or lower). Eight major manufacturers, three of them with partial Article 5 ownership, consume 1,808 mt (99.44 ODP tonnes) of HCFC-22 and 23 locally owned SMEs consume the remaining 107 mt (5.89 ODP tonnes). In 2009, 2.8 million units were produced in Malaysia, 1.86 million of them were exported, and an additional 200,000 units were imported. Market penetration of air-conditioning equipment has grown significantly in the past few years and it is expected to continue over the next several years.

9. The refrigeration manufacturing sector is relatively smaller but is also growing and experiencing competition from imported units. The commercial refrigeration subsector mostly uses HFC-134a and R-404a, while the cold chain refrigeration subsector uses R-404a, R-507, and ammonia to a lesser extent. In 2009, 80 mt (4.40 ODP tonnes) of HCFC-22 were used by 20 enterprises to manufacture commercial refrigeration equipment (vending machines, bottle coolers, water-coolers, chest freezers), and 250 mt (13.75 ODP tonnes) were used in the cold chain refrigeration manufacturing sub-sector (supermarkets, cold storages and warehouses). The consumption of HCFC in the manufacturing of RAC equipment is presented in Table 3.

Table 3: Consumption of HCFC-22 in the RAC manufacturing sectors in 2009

Sector	Sub-sector	Metric tonnes	ODP tonnes
Air-conditioning manufacturing	Air-cooled split and packaged units	1,750.00	96.25
	Water-cooled packaged units	21.00	1.16
	Heat pumps	4.00	0.22
	Direct expansion chillers	92.00	5.06
	Flooded chillers	48.00	2.64
	Total	**1,915.00**	**105.33**
Refrigeration manufacturing	Domestic refrigeration	0.00	0.00
	Commercial refrigeration	80.00	4.40
	Cold chain refrigeration	250.00	13.75
	Total	**330.00**	**18.15**
Grand Total RAC manufacturing sector		**2,245.00**	**123.48**

PU foam manufacturing sector

10. The PU foam manufacturing sector in Malaysia is composed of seven systems houses, around 104 foam manufacturers, and 15-20 chemical suppliers. The HCFC-141b could be imported by the chemical suppliers, the systems houses or directly by the foam manufacturer. Most of the HCFC-141b imported is in bulk; only a small portion is contained in imported pre-blended polyols. Out of the seven systems houses, four are Malaysian-owned (Colorex, Maskimi, Oriken and PPT) and the remaining are multi-nationals (BASF, Cosmo and Dow). In 2009, the four Malaysian systems houses consumed about 278 mt (30.58 ODP tonnes) of HCFC-141b (20.8 per cent of the HCFC-141b imported in bulk) for

pre-blending in polyols to supply SMEs. The multi-national systems houses, in line with their corporate policies, prefer not to offer HCFC-141b pre-blended polyols, instead they supply polyols mainly to the larger enterprises that undertake the blending in-house.

11. Out of the estimated 104 foam manufacturers, 13 are large-sized and organized enterprises, about 20 are medium-sized manufacturers and the remaining 71 are small manufacturers. The 13 larger enterprises consumed 860 mt (94.60 ODP tonnes) of HCFC-141b in 2009 in the manufacturing sandwich panels, refrigeration equipment and insulated boxes. The remaining 91 SMEs consumed the remaining 475 mt (52.3 ODP tonnes) in the manufacturing of rigid PU foam products (except 3-4 that manufacture integral skin foam). The consumption of HCFC-141b in the PU foams sectors is presented in Table 4.

Table 4: Consumption of HCFC-141b in the PU foams sector 2009

Sub-sector	Application	Number of enterprises	Metric tonnes	ODP tonnes
Rigid Foam	Discontinuous sandwich panels	30	1,045	114.95
	Refrigeration equipment	10	90	9.90
	Insulated boxes	1	40	4.40
	Pipe insulation	10	40	4.40
	Spray insulation	10	50	5.50
	Other (*)	40	60	6.60
	Total (Rigid Foam)	**101**	**1,325**	**145.75**
Integral Skin	Furniture and automotive	3	10	1.10
	Total (Integral Skin Foam)	**3**	**10**	**1.10**
Total		**104**	**1,335**	**146.85**

(*) Includes other insulation (boardstock, etc)

12. The PU foam sector expects to grow at an average annual rate of 10-12 per cent due to the expansion of the construction industry and the growing demand for consumer and commercial goods.

Refrigeration and air-conditioning servicing sector

13. The estimated consumption of HCFCs (mostly HCFC-22) in servicing refrigeration and air-conditioning equipment was 4,055 mt (222.80 ODP tonnes) in 2009. Unconstrained consumption is likely to reach 5,000 mt (274.72 ODP tonnes) in 2015. In regards to the air-conditioning subsector, over 95 per cent of the HCFC-22 was consumed in servicing an estimated population of 7 million split and packaged air-conditioning units. The servicing demand for HCFC-22 in the refrigeration sector was estimated at 250 mt (13.75 ODP tonnes) in 2009. This demand is also growing due to retrofits carried out for R-502 based equipment and the increasing population of commercial refrigeration equipment.

Other sectors

14. Less than one per cent of the HCFCs in Malaysia are consumed in manufacturing of extruded polystyrene foam (10 mt of HCFC-22 and HCFC-142b combined), fire extinguishing systems (13 mt of HCFC-123), and in the solvents sector in precision cleaning, drying and defluxing applications, electronics cleaning, as a carrier for silicone and as a coolant (0.67 mt of HCFC-225).

HCFC phase-out strategy

15. The Government of Malaysia developed a staged approach to comply with the adjusted control schedule for HCFCs. Stage I of the HPMP for the 2011-2015 period, which is intended to address 103.16 ODP tonnes of consumption, will focus on:

(a) Converting manufacturing facilities in HCFC consuming sectors where non-HCFC, zero ODP and low-global warming potential (GWP) technologies can be applied (foam sector plan);

(b) Assistance in the servicing sector to control the growth of HCFC consumption; and

(c) Technical assistance, training and awareness actions to support the sustainability of the HCFC reductions proposed; and

(d) Targeted regulations to ensure sustainability of the HCFC reductions proposed.

16. Stage II (2015-2020) will focus on the phase-out of HCFC consumption in the remaining manufacturing sectors; reductions in HCFC consumption in the servicing sector; and sustained monitoring and enforcement of legislation. Subsequent stages (beyond 2020) will focus on further reductions of HCFC demand in the servicing sector by strengthening infrastructure for refrigerant management; and introducing decentralized enforcement mechanisms to mainstream the Montreal Protocol in national and local institutions.

Proposed phase-out activities for stage I of the HPMP

PU foam sector plan

Background

17. Between 1992 and 2009 financial support was provided by the Multilateral Fund for the conversion of CFC-based foam enterprises to alternative technologies. Around US $14 million were approved for Malaysia to phase out of 1,800 ODP tonnes of CFC-11 in domestic refrigeration, commercial refrigeration, other rigid insulation applications, integral skin, flexible moulded and flexible slabstock applications. Most of the enterprises were converted to HCFC-141b, followed by carbon dioxide and methylene chloride. Some of these applications no longer use ODS in Malaysia. For others, such as the manufacturing of panels, the HCFC-141b-based capacity has increased substantially in the last 15 years.

Action plan for the PU foam sector

18. In order to achieve the HCFC consumption reductions required to meet the freeze and the 10 per cent reduction target, the Government of Malaysia has given priority to the PU foam manufacturing sector, in particular to applications and sub-sectors where mature, low-GWP technologies are available and can be applied to financially sound and viable enterprises with good technical and managerial capacity and large consumption. Based on these criteria, the 13 largest PU foam manufacturers of discontinuous sandwich panels for construction, insulation for refrigeration equipment, insulated boxes and insulated pipes were selected for conversion to cyclopentane technology. These companies consume 860 mt (94.60 ODP tonnes) of HCFC-141b that represents 64 per cent of the HCFC consumption in the foam manufacturing sector and 11 per cent (or 19 per cent measured in ODP tonnes) of the total HCFC consumption in Malaysia. Their individual consumption varies between 33 mt and 207 mt. All these enterprises are locally owned and have no exports to non-Article 5 countries. All the production lines in these enterprises were established prior to 2007. The list of enterprises included in the investment component of the PU foam sector plan is included in Table 5 below.

Table 5: List of enterprises included in the investment component of the PU foam sector plan

Company	Date of establishment	Products	Second-stage conversion	Funds approved (US $)	CFC-11 phased-out (ODP tonnes)	Dispensers retrofitted or replaced	Current number of dispensers
Berjaya	1980	Commercial refrigeration	No				4
Linear	2000	Sandwich panels	No				1
Ocean	2005	Insulated boxes	No				4
Saicond	1986	Sandwich panels	No				2
Supiera	1976	Sandwich panels	No				1
Zun Utara	1967	Commercial refrigeration	No				3
Cycleworld	1993	Sandwich panels	Yes	353,000	45	1	4
Insafoam	1992	Sandwich panels, pipes	Yes	310,000	30	1	5
Kwangtai	1993	Commercial refrigeration	Yes	316,000	25.5	2	2
Pangkat	1980	Sandwich panels	Yes	210,000	20	1	3
Ricwil	1984	Pre-insulated pipes	Yes	118,000	25	1	2
Rigidfoam	1979	Sandwich panels	Yes	335,000	19	2	5
United	1978	Sandwich panels	Yes	351,200	67	2	2
TOTAL				**1,993,200**	**231.5**	**10**	**38**

19. The investment component will be complemented by two technical assistance components: one to ensure availability of low-GWP cost-effective alternatives in four locally owned systems houses to supply downstream enterprises that are unable to participate in stage I; and one to disseminate information on emerging low-GWP alternatives to downstream enterprises.

Selection of technology

20. Cyclopentane was selected by the 13 enterprises as it is a proven and reasonably mature technology with favourable processing characteristics and compliance with established standards on health, safety and environment, including zero ODP and low-GWP. Other technologies considered but not selected were HFC-based systems (high-GWP and high operational costs), water-based systems (unsatisfactory density and insulation values and commercial availability) and methyl formate (currently in an initial stage of adoption in some markets).

Incremental costs for the investment component

21. The conversion of the 13 enterprises to cyclopentane technology requires substantial changes in the manufacturing plants to conform to safety standards for storage, delivery and handling of flammable substances. Conversion of these enterprises includes: installation of storage tanks for cyclopentane (US $75,000/unit); pumps and premixing stations (US $90,000/unit); additional polyol buffer tanks (US $15,000/unit); retrofitting of high-pressure foam machines (US $75,000) and replacement of low-pressure foam machines with high-pressure units when applicable (US $120,000); safety-related equipment for the use of a flammable blowing agent (US $310,000/plant); retrofit of jigs and moulds (US $45,000/plant); training, trials, testing (US $150,000/plant) and contingencies (estimated at 10 per cent of the capital cost). Incremental operational costs were calculated based on baseline prices and formulations from the participating enterprises.The PU foam sector project will achieve a reduction of 860 mt (94.6 ODP tonnes) of HCFC-141b.

22. The overall cost of the conversions was estimated at US $17,107,000. Applying the cost-effectiveness threshold for the foam sector (US $7.83/kg plus 25 per cent for introducing a low-GWP technology), the eligible funding for the investment component is US $7,633,870. The enterprises are committed to contribute with the counterpart funding of US $9,473,130 during the implementation of the project. The consumption by enterprise and incremental costs are presented in Table 6 below.

Table 6: Incremental costs investment component PU foam sector plan

Company	Consumption		Cost (US $)				Counterpart funding	
	mt	ODP tonnes	capital	operational	Total	Eligible		
Berjaya	43	4.73	1,430,000	43,000	1,473,000	420,970	1,052,030	71%
Cycleworld	160	17.6	1,529,000	160,000	1,689,000	1,566,400	122,600	7%
Insafoam	41	4.51	1,677,500	41,000	1,718,500	401,390	1,317,110	77%
Kwangtai	39	4.29	1,034,000	39,000	1,073,000	381,810	691,190	64%
Linear	38	4.18	836,000	38,000	874,000	372,020	501,980	57%
Ocean	49	5.39	1,479,500	49,000	1,528,500	479,710	1,048,790	69%
Pangkat	61	6.71	1,215,500	61,000	1,276,500	597,190	679,310	53%
Rigidfoam	55	6.05	1,776,500	55,000	1,831,500	538,450	1,293,050	71%
Saicond	35	3.85	1,133,000	35,000	1,168,000	342,650	825,350	71%
Supiera	36	3.96	836,000	36,000	872,000	352,440	519,560	73%
United	207	22.77	1,034,000	207,000	1,241,000	1,241,000	0	0%
Zun Utara	33	3.63	1,232,000	33,000	1,265,000	323,070	941,930	74%
Ricwil	63	6.93	1,034,000	63,000	1,097,000	616,770	480,230	44%
Total	**860**	**94.60**	**16,247,000**	**860,000**	**17,107,000**	**7,633,870**	**9,473,130**	**57%**

Technical assistance component

23. Technical assistance to four local systems houses is proposed for customizing formulations using new and emerging low-GWP alternative technologies (mainly FEA-1100, HBA-2, AFA-L1, methyl formate and methylal) during the next three years to ensure availability of cost effective alternatives to the downstream enterprises that are unable to participate in stage I, so they are adequately prepared to undertake conversion during stage II. The four locally owned systems houses import 278 mt (30.58 ODP tonnes) of HCFC-141b for pre-blending and selling HCFC-based systems mostly to the SMEs in the foam manufacturing sector. The Government of Malaysia considers this component critical as it takes between 2 and 3 years to stabilize a technology for pre-blended polyols and ensure cost-effectiveness and market acceptance. This component is expected to reduce the investment and operating costs for HCFC phase-out in the SMEs and will also contribute to the overall reduction in the use of HCFC-141b in the foam sector.

24. The project will provide to the four systems houses pilot-scale facilities for customizing trials, evaluation and validation of non-HCFC formulations. The equipment required by each systems house includes pre-mixing station (US $90,000), laboratory-scale reactor (US $20,000), a pilot ethylene propylene oxide blending and storage facility (US $25,000), retrofitting of the existing plant and machinery (including low-pressure dispensers) to handle non-HCFC chemicals (US $35,000), assorted jigs and moulds for trials demonstration (US $10,000), evaluation and measuring equipment (US $15,000) and technical assistance, trials and training (US $40,000). Technical support to the sector for information dissemination on emerging low-GWP alternatives is also included. The enterprises involved and the cost are presented below in Table 7.

Table 7. Technical assistance costs for systems houses in Malaysia

Parameter	Colorex	Maskimi	Oriken	PPT	Total
Date of establishment	1996	1996	2003	1996	
Article 5 ownership	100 %	100 %	100 %	100 %	100%
Exports to non-Article 5 countries	0%	0%	0%	0%	0%
HCFC-141b use (2009)	23	41	127	87	278
Change in ODS-based capacity since 2007	None	None	None	None	
Subsectors served	Rigid PU foam	Rigid PU foam	Rigid PU foam	Rigid PU foam	
Incremental capital cost	**258,500**	**258,500**	**258,500**	**258,500**	**1,034,000**

25. A small component of technical assistance is also included in the foam sector plan to keep downstream users (mostly SMEs) abreast of the latest technological developments, share information and exchange experiences on alternatives, and document positive results for wider acceptance. The technical assistance includes five workshops and dissemination of material at an estimated cost of US $90,000.

Total cost for the PU foam sector plan

26. The total cost of the PU foam sector plan has been estimated at US $8,757,240 as shown in Table 8.

Table 8: Cost of the PU foam sector plan stage I of the HPMP for Malaysia

Component	Funds requested US $
Conversion of 13 foam enterprises to cyclopentane	7,633,870
Technical assistance for 4 locally owned systems houses	1,034,000
Technical assistance for downstream SMEs	90,000
Total	**8,757,870**

Technical assistance for the servicing sector

27. The Government of Malaysia considered it necessary to intervene in the servicing sector to control growth of HCFC consumption and reduce 8.56 ODP tonnes of HCFC-22 (6.20 ODP tonnes in air-conditioning and 2.36 ODP tonnes in refrigeration) by 2015 through the following activities:

(a) Containment, recovery and reclamations through 10 training and refrigerant management centres (TRMC) that will receive one set of a mini-reclaim unit, accessories and tools and technical assistance during the project duration. They will identify, train and certify technicians to participate in the programme, distribute 60 sets of recovery units and tools, collect counterpart funding, provide reclamation services on a commercial basis, and record usage of reclaimed refrigerants (US $450,000);

(b) Capacity-building of technicians and enforcement officials: This includes preparation of 15 trainers to provide training to 150 technicians on air-conditioning and refrigeration system design, operation and maintenance, codes and standards for manufacturing, operation health and safety, leak control and best practices on system monitoring. It also covers training of 90 enforcement officers on, *inter alia*, obligations under the Montreal Protocol, nomenclature of refrigerant blends, harmonization of databases between

enforcements and other departments, harmonized system codes, labelling standards and use of refrigerant identifiers (US $165,000); and

(c) Pilot retrofitting/replacement programme for end-users; through which two large users in the air-conditioning sector (apartment complexes and commercial air-conditioning) will be selected, and two large users in the refrigeration sector (cold storage and supermarkets). Each end-user would be provided financial assistance covering retrofitting replacement costs (up to US $15,000). This will allow cases of retrofitting and replacement of HCFC-based equipment to be demonstrated, build confidence in other end-users, precipitate early retrofitting and replacement in other end-users, and reduce HCFC demand for servicing equipment at end-users (US $100,000).

Technical assistance for the air-conditioning and refrigeration manufacturing sectors

28. Malaysia is one of the manufacturing hubs in Southeast Asia for air-conditioning and refrigeration equipment, with over 60 per cent of the production exported. The RAC manufacturing sector is the largest manufacturing sector in Malaysia consuming HCFC-22 (2,245 mt in 2009). However, this sector is not being addressed in stage I of the HPMP given that alternative technologies suited to SMEs manufacturing RAC equipment are not fully commercialized and it would take 3 to 4 years to stabilize a technology to ensure cost-effectiveness and market acceptance. Given the rapidly increasing population of RAC equipment, the need to control HCFC consumption and to comply with related regulations that will come into effect in 2013 and 2015 (ban on establishment and expansion of new HCFC-based manufacturing capacities in 2013 and ban on manufacturing, assembly and import of HCFC-based air-conditioners 2.5 HP and lower for local use in 2015), and considering that these two sectors are not prioritized for stage I, the Government of Malaysia views it necessary to provide technical assistance to locally manufacturing companies to ensure that they are adequately supported in managing HCFC and non-HCFC technologies.

29. The project will keep industry abreast of the latest technological developments, share information and exchange experiences with alternatives through five technical workshops (one annually) and dissemination of technical material. This will ensure engagement of locally owned manufacturers in the HCFC phase-out efforts and enable them to be prepared for cost-effective conversion to such technologies in stage II. The cost of the project was estimated at US $90,000.

Management, coordination and monitoring

30. This component includes all the management and coordination activities required to ensure timely implementation of stage I. These are awareness and communications actions to support the activities in stage I, and the establishment of policies and targeted regulations to support the HCFC reductions proposed in stage I, and to help control the growth in HCFC consumption in sectors that would be unaddressed in stage I. The main policies proposed are:

(a) Introduction of quotas to HCFC imports (2012 to enter into force in 2013);

(b) Amendment of regulations for controlling use, imports, manufacturing, assembly and installation of products containing HCFCs (2012);

(c) Licensing re-export of HCFCs (2013);

(d) Prohibition of establishment and expansion of new HCFC-based manufacturing capacities (2013);

(e) Incentives system for promoting use of alternatives (2013);

(f) Certification of technicians to handle HCFCs (2013);

(g) Prohibition of manufacturing, assembly and import of HCFC-based air-conditioners (2.5 HP and lower) for use in Malaysia (2015);

(h) Ban on imports of polyols pre-blended with HCFCs (2015); and

(i) Inclusion of HCFCs in the list of restricted gases (2015).

31. The cost of the management, coordination and monitoring component is US $990,000.

Total cost of the HPMP

32. The total cost for the implementation of stage I of the HPMP as submitted is estimated at US $10,552,240 (excluding agency support cost) to reduce 103.16 ODP tonnes of HCFCs, representing 20 per cent of the HCFC consumption baseline. Table 9 presents the allocated funds for activities planned under the HPMP.

Table 9: Total cost of stage I of the HPMP for Malaysia, as originally submitted

Strategic component	Impact ODP			Cost (US $)		
	HCFC-22	HCFC-141b	Total	Total	Counterpart	Requested
1. PU foam sector plan						
Conversion of 13 foam enterprises to cyclopentane		94.60	94.60	17,107,000	9,473,130	7,633,870
Technical assistance to 4 system houses to introduce alternatives for SMEs				1,034,000		1,034,000
Technical assistance to the foam sector				90,000		90,000
Total PU foam sector plan		**94.60**	**94.60**	**18,231,000**	**9,473,130**	**8,757,870**
2.Technical assistance for the servicing sector						
Containment, recovery and reclamation project				450,000		450,000
Capacity building for technicians and government officials				165,000		165,000
Pilot retrofitting/replacement programme for end-users				100,000		100,000
Total technical assistance for the servicing sector	**8.56**		**8.56**	**715,000**		**715,000**
3. Technical assistance for the RAC manufacturing sectors				**90,000**		**90,000**
4. Management coordination and monitoring				**990,000**		**990,000**
Total	**8.56**	**94.60**	**103.16**	**20,026,000**	**9,473,130**	**10,552,870**

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

33. The Secretariat reviewed the HPMP for Malaysia in the context of the guidelines for the preparation of HPMPs (decision 54/39), the criteria for funding HCFC phase-out in the consumption

sector agreed at the 60th meeting (decision 60/44), subsequent decisions on HPMPs and the 2011 – 2014 business plan of the Multilateral Fund. The Secretariat discussed technical and cost-related issues with UNDP, which were satisfactorily addressed as summarized below.

Starting point for aggregate reduction in HCFC consumption

34. The Government of Malaysia agreed to establish as its starting point for sustained aggregate reduction in HCFC consumption the estimated baseline of 515.76 ODP tonnes, calculated using actual consumption of 494.04 ODP tonnes and 537.47 ODP tonnes reported for 2009 and 2010, respectively, under Article 7 of the Montreal Protocol.

Technical and cost related issues associated with the foams manufacturing sector

Investment component

Enterprises eligibility and second-stage conversions

35. In regard to the investment component to phase out the use of HCFC-141b in 13 enterprises, UNDP confirmed that all the equipment in the baseline was purchased prior to the cut-off date of 21 September 2007, and all the enterprises were locally owned. In justifying the need to include second-stage conversions in line with decisions 60/44(b) and 62/16, UNDP confirmed the following:

(a) Seven out of the 13 enterprises had previously received funds to phase out CFC-11 between the 11th and the 15th Executive Committee meetings (1993 to 1995). At the time the enterprises consumed 231.5 ODP tonnes of CFC-11 and completed their conversion to HCFC-141b between 1996 and 1998. Out of the 10 foam dispensers replaced during CFC phase-out, 8 are no longer in operation due to retirement;

(b) At present, these seven enterprises have a total of 23 foam dispensers operating on HCFC-141b, with a total consumption 626 mt of HCFC-141b (2009). Production capacity and production levels in these enterprises have increased respectively by about 230 per cent and 250 per cent after CFC phase-out. A total of 21 out of the 23 foam dispensers operating with HCFC-141b in these plants were procured and installed with the enterprises' resources after completion of the CFC phase-out projects;

(c) As a consequence, over 90 per cent of the current baseline in terms of capacity and production levels (HCFC consumption), originates from new HCFC-based capacity added after the CFC phase-out projects were completed;

(d) The seven enterprises are large-sized enterprises contributing significantly to the proposed phase-out of HCFC-141b (about 626 mt out of 860 mt) and the reduction targets up to 2020. The remaining enterprises in the sector, other than the selected 13, are small and medium-sized, where mature and low-GWP alternatives cannot be implemented cost-effectively at the current time;

(e) Therefore, these seven enterprises, which are technically second-stage conversions (but practically only 10 per cent of their capacity/production represents the impact of second conversion), need to be prioritized, due to their significant consumption and ability to achieve cost-effective conversion as compared to other enterprises in the sector.

(f) Between 2005 and 2009 HCFC consumption in Malaysia grew at an annual average rate of 8.28 per cent. During 2011 and 2012 Malaysia will limit the growth of HCFC consumption at about 2.75 per cent annually, reaching a maximum level of

567.38 ODP tonnes when the quota is introduced in 2013. Thus, an estimated reduction of 51.6 ODP tonnes would be required to meet the 2013 compliance target, and an additional reduction of 51.5 ODP tonnes would be needed between 2013 and 2015 to achieve the 2015 compliance target. Therefore, the total estimated reductions needed for meeting both the 2013 and 2015 controls through stage I of the HPMP are 103.16 ODP tonnes. The above scenario therefore strongly justifies the inclusion of these enterprises in stage I, otherwise compliance with the 2013 and 2015 targets would not be possible.

Incremental costs

36. The Secretariat noted that the number of foam dispenser equipment, pre-mixing stations and buffer tanks for several of some of the companies with low HCFC consumption was similar to those in the largest companies, and enquired UNDP on whether optimization of the layouts and industrial rationalization could be considered as part of the conversion plans. UNDP advised that some of the panel manufacturing companies use several large presses that require space and organization of the equipment around them. In many cases one foam dispenser serves only one press. Upon further discussion, an additional effort of rationalization was done in conjunction with the companies, which resulted in a reduction on the number of dispensers to be replaced or retrofitted from 38 to 27, as well as a reduction in the number of pre-mixing stations and polyol buffer tanks from 37 to 24.

37. Other cost related issues were discussed and satisfactorily addressed. Incremental capital costs related to premixing stations, buffer tanks, ventilation and exhaust system, product and process trials, process and safety training, audit and technical assistance from external experts were rationalized upon discussions with the Secretariat. The total cost of the project was reduced from US $17,107,000 to US $14,318,500 with a cost effectiveness of US $16.64/kg. However, given the cost-effectiveness threshold for foam conversion projects of US $9.79/kg, the total level of funds requested for this project is US $7,327,470, with the remaining balance of US $6,991,030 to be covered by the beneficiary enterprises.

38. In addressing the Secretariat's concern about the level of counterpart funding required from some of the enterprises, UNDP advised that all the enterprises included in stage I of the HPMP are large, well organized and many of them are not only dedicated to the manufacturing of rigid PU foam. All the companies have confirmed their capacity and willingness to provide the required counterpart funding to implement the project.

Technical assistance component

39. In regard to the technical assistance to systems houses, the Secretariat questioned the need to include in stage I of the HPMP an activity without HCFC reduction commitment, and expressed its concern over the uncertainty associated to this project in ensuring availability of affordable and safe low-GWP alternatives for SMEs in the country, which would depend rather on external factors (commercial, legal and infrastructure) than on the success of the project. UNDP explained that there are some promising emerging alternatives that are non-flammable, have a good insulation performance and require minimal investment at the foam enterprise level, but it could take two years for them to be commercially available in Malaysia. The project aims to equip the local systems houses supplying SMEs to absorb the emerging alternatives as soon as they become commercially available. At that point the systems houses will immediately initiate the introduction of polyols pre-blended with emerging alternative blowing agents at the downstream SMEs, to replace as much HCFC-141b consumption as possible during the period 2013-2015. This will expedite the phase-out of downstream companies in 2015 as supply chains will be established. UNDP expects that a significant number of SMEs in the rigid PU foams sector would adopt the emerging alternatives prior to the 2015 compliance target. This could result

in reduction of HCFC consumption and could significantly reduce the cost of conversion at SMEs, by an amount at least equal to the investments made at the systems houses during stage I.

40. UNDP also explained that this component is built around the planned ban on import of HCFC-141b pre-blended polyols effective from 1 January 2015. As HCFCs in pre-blended polyols are not considered as controlled substances, in absence of such a regulation the Government would not be able to prevent any systems house from importing or exporting HCFC-141b pre-blended polyols, including the foreign owned systems houses. With such a regulation in place, complemented by adequate assistance to the locally-owned systems houses, adoption of the emerging alternatives would be assured and this will precipitate early conversions at SMEs. In addition, the Government will be able to sustain any reduction in HCFC consumption generated by the introduction of alternatives by adjusting the HCFC import quota accordingly. This will avoid efforts made by these companies being undermined by other companies in the sector.

41. Following discussion on the concrete outcomes of this project, the following was determined:

(a) Each of the systems houses would be required to have at least one low-GWP formulation ready upon completion of their respective sub-projects, to be commercially available on the market. Based on current knowledge, UNDP expects the systems house conversions to be completed by the end of 2013;

(b) Each systems house would be required to demonstrate application of the new formulations at minimum to two downstream SMEs with a total consumption of at least 5 mt. This would represent a total of 20 mt for the four systems houses. While UNDP cannot assure at this point the sustainable phase-out at downstream enterprises without accurate knowledge of the costs, it expects that a much larger number of SMEs would adopt the alternatives prior to 2015 as these alternatives are expected to have established supply chains; and

(c) The implementation of this technical assistance project will enable the Government to control the HCFC-141b use by the systems houses through the quota system from 2013 onwards. If by the end of 2013, the systems houses successfully commercialize pre-blended polyols with low-GWP alternatives, the HCFC-141b quota for the systems houses can be accordingly adjusted.

42. In addition, the four systems houses covered by this project will not receive further assistance from the Multilateral Fund in future stages of the HPMP. Having determined the above conditions, under the discussion on incremental costs it was agreed that the systems houses would assume the cost of any retrofit of the foam equipment that they may be required to undertake as part of the project, so reducing the assistance per enterprise from US $258,500 to US $220,000.

43. Finally it was agreed to merge the two foam technical assistance components (systems houses and downstream users) into only one technical assistance component that would complement the investment project at a total cost of US $970,000 (US $880,000 for technical assistance to the system houses and US $90,000 for technical assistance to the manufacturing companies).

44. Table 10 presents the final costs of the foam sector plan.

Table 10: Final cost of the PU foam sector plan

Component	Funds requested US $
Conversion of 13 foam enterprises to cyclopentane	7,327,470
Technical assistance for systems houses and downstream SMEs	970,000
Total	**8,297,470**

Technical and cost related issues associated with the servicing sector

45. Considering that the PU foam project will already achieve HCFC reductions for 18 per cent of the baseline, a rationale to justify the need to include activities in the servicing sector in stage I was provided. Since a large portion of the unaddressed consumption is in the servicing sector, it was necessary to plan activities to curb the growth in HCFC consumption in servicing to acceptable levels. Malaysia will aim to restrict the HCFC growth in HCFC consumption during 2011 and 2012, to 2.75 per cent annually. From 2013 onwards, this will be achieved through implementation of the AP system quotas.

46. UNDP further explained that the activities proposed are the minimum needed to adapt and build on the servicing sector infrastructure to effectively control the growth in this sector. On clarifying aspects of the recovery and reclaiming component, UNDP indicated that reclaiming units will be strategically located to avoid logistical issues, the TRMCs will receive assistance to operate in a sustainable way during the years of the project, and the technicians will contribute through a small fee for the recovery equipment. On the retrofit/reconversion pilots UNDP informed that, in addition to the technical assistance in retrofit cost, it is aimed to involve equipment providers to obtain better prices for the beneficiaries and facilitate the conversions. Further to discussions on the activities selected, their cost and minor rationalizations, the Secretariat found the approach and the level of funds requested for the servicing sector to be reasonable. The agreed cost for technical assistance for the servicing sector was US $690,000, which will reduce 8.42 ODP tonnes of HCFC.

Technical and cost related issues associated with the RAC manufacturing sector

47. The Secretariat requested clarification on how the technical assistance for the unaddressed air-conditioning and refrigeration manufacturing sectors would contribute to compliance during stage I. UNDP explained that a significant portion of HCFC consumption in Malaysia originates from HCFC-based air-conditioners with a capacity of 2.5 HP or lower, the estimated population of this type of unit in Malaysia is 7 million, around one million units being manufactured every year for the local market and an additional 200,000 units are imported. In view of this, the Government included as part of the regulations proposed for stage I of the HPMP the ban on manufacturing, assembly and import of HCFC-based air-conditioners (2.5 HP and lower) for use in Malaysia from 1 January 2015. This regulation will force all manufacturers to stop production of this kind of equipment for local use. While the eight non-Article 5-owned manufacturers consuming 1,808 mt (99.44 ODP tonnes) should adapt to this ban with their own resources, the project intends to assist the remaining 23 locally owned enterprises consuming 107 mt (5.88 ODP tonnes) of HCFC-22 to prepare for the eventual phase-out triggered by the regulation. It will be done through technology workshops, which will guide them to rationalize their product mix, and provide latest information on development of alternatives and their application.

48. UNDP clarified that, while the proposed regulation may generate reduction in the consumption of HCFC-22 in manufacturing equipment during stage I, it is not intended to phase out the HCFC-22 consumption in these SMEs as they could still shift production to higher capacity units or produce for export. Instead, the regulation is targeted to control the population of HCFC-22 based air-conditioners of 2.5 HP and lower, after 1 January 2015. Through the proposed technical assistance component, these enterprises are expected to be in a better position to select suitable alternative technologies and also to select one of three options for remaining sustainable (converting production of the same units to an

HCFC-free technology, shifting production to other types of equipment, or continue producing HCFC-22 based air-conditioners exclusively for exports).

49. While the Secretariat understands that the project is not intended to phase out the 107 mt of HCFC-22 used by the 23 locally-owned enterprises assisted, it recognizes its value in reducing future demand for HCFC-22 in servicing as it will assist them to adapt to the manufacturing ban in 2015, allowing enforcement of the regulation and ending the introduction of additional small HCFC-22 based air-conditioning units into the local market. In addition, it is recognized that the current consumption in the manufacturing of these units by local and non-Article 5 owned enterprises will be phased out and the overall HCFC consumption in manufacturing of RAC equipment may also have a reduction. On this basis the Secretariat can support the inclusion of this project in stage I of the HPMP. It was agreed that this project should be part of the package of activities under the RAC servicing sector at a cost of US $90,000.

Cost of the HPMP

50. The total agreed cost for the implementation of stage I of the HPMP is estimated at US $9,587,470 as presented in Table 11.

Table 11: Total cost of stage I of the HPMP for Malaysia

Strategic component	Impact ODP			Cost (US $)		
	HCFC-22	HCFC-141b	Total	Total	Counterpart	Requested
PU foam sector plan						
Conversion of 13 foam enterprises to cyclopentane		94.60	94.60	14,318,500	6,991,030	7,327,470
Technical assistance to 4 system houses and to downstream users				970,000		970,000
Total PU foam sector plan		**94.60**	**94.60**	**15,288,500**	**6,991,030**	**8,297,470**
Technical assistance for the servicing sector						
Containment, recovery and reclamation project				352,000		352,000
Capacity building for technicians and government officials				150,000		150,000
Pilot retrofitting/replacement programme for end-users				98,000		98,000
Technical assistance for the RAC manufacturing sectors				90,000		90,000
Total technical assistance for the servicing sector	**8.42**		**8.42**	**690,000**		**690,000**
Management coordination and monitoring				**600,000**		**600,000**
Total	**8.42**	**94.60**	**103.02**	**16,578,500**	**6,991,030**	**9,587,470**

51. The Secretariat noted that stage I of the HPMP is proposing an HCFC consumption reduction of 103.02 ODP tonnes that correspond to 19.97 per cent of the baseline. The Secretariat drew UNDP's attention to discussions and decisions on this issue at the 63rd and 64th meetings where the Executive Committee had noted that in such cases when the HPMP proposes to address more than 10 per cent of the baseline by 2015, an extended commitment beyond 2015 should be solicited from the Government concerned. In response UNDP advised that the HCFC reduction was determined based on an exhaustive analysis of consumption patterns in various sectors and sub-sectors, with the full participation and inputs of national stakeholders. Based on this, to meet the 2013 and 2015 targets, the phase-out quantity is considered reasonable and justified in comparison with several other HPMPs for non-LVCs.

Impact on the climate

52. The net impact on the climate of the phase-out of HCFC-141b in the 13 foam manufacturing enterprises included in stage I was calculated as the difference in the direct emissions between HCFCs and cyclopentane. The calculation is presented in Table 12 below.

Table 12: Calculation of the impact on the climate foams

Substance	GWP	Tonnes/year	CO_2-eq (tonnes/year)
Before conversion			
HCFC-141b	725	860	623,500
After conversion			
Cyclopentane	20	688	13,760
Net impact			609,740

53. The proposed technical assistance activities in the HPMP, which include the introduction of better servicing practices and enforcement of HCFC import controls, will reduce the amount of HCFC-22 used for refrigeration servicing. Each kilogram (kg) of HCFC-22 not emitted due to better refrigeration practices results in approximately 1.8 CO_2-equivalent tonnes saved. A preliminary estimation of the impact on the climate as calculated by Malaysia in its HPMP indicates that 280,550 CO_2-equivalent tonnes would not be emitted into the atmosphere (calculation based on the reduction of 155 mt of HCFC-22 in the RAC servicing sector through better practices and recovery, recycling and reclaiming) The total climate impact from activities in the foam and servicing sectors in stage I (890,290 CO_2-equivalent) is higher than the potential climate impact of the HPMP indicated in the 2011-2014 business plan of 123,935 CO_2-equivalent tonnes. The two main reasons for this are that the number of tonnes reduced by stage I is bigger than the forecasted in the business plan, and that HCFC reductions expected from two projects in the RAC manufacturing sector with relatively modest climate impact were replaced by the foam manufacturing project introducing cyclopentane.

54. A more precise forecast of the impact on the climate of the activities in the servicing sector is presently not available. The impact might be established through an assessment of implementation reports by, *inter alia*, comparing the levels of refrigerants used annually from the commencement of the implementation of the HPMP, the reported amounts of refrigerants being recovered and recycled, the number of technicians trained and the HCFC-22 based equipment being retrofitted.

Co-financing

55. In response to decision 54/39(h) on potential financial incentives and opportunities for additional resources to maximize the environmental benefits from HPMPs pursuant to paragraph 11(b) of decision XIX/6 of the Nineteenth Meeting of the Parties, UNDP indicated that the enterprises involved in the PU foam sector plan are ready to implement the conversions as proposed with the required counterpart funding, that amounts to US $6,991,030.

2011-2014 business plan of the Multilateral Fund

56. UNDP is requesting US $9,587,470 plus support cost for implementation of stage I of the HPMP. The total value requested for the 2011-2014 period of US $9,275,877 including support cost is below that in the business plan. The reason is that the activities selected for stage I of the HPMP are more cost-effective than those included in the business plan (investment projects to reduce HCFC-22 consumption in the RAC sector). With a slightly lower level of funds, stage I of the HPMP will reduce a larger number of ODP tonnes (103.02 ODP tonnes against 41.5 ODP tonnes in the business plan).

Draft agreement

57. A draft agreement between the Government of Malaysia and the Executive Committee for HCFCs phase-out is contained in Annex I of the present document.

RECOMMENDATION

58. In light of the Secretariat's considerations above, in particular paragraph 51, the Executive Committee may wish to consider:

(a) Approving, in principle, stage I of the HCFC phase-out management plan (HPMP) for Malaysia for the period 2011 to 2015 to meet the 10 per cent reduction in HCFC consumption, at the amount of US $9,587,470 plus agency support costs of US $719,060 for UNDP,

(b) Noting that the Government of Malaysia had agreed to establish as its starting point for sustained aggregate reduction in HCFC consumption the estimated baseline of 515.76 ODP tonnes, calculated using actual consumption of 494.04 ODP tonnes and 537.47 ODP tonnes reported for 2009 and 2010, respectively, under Article 7 of the Montreal Protocol;

(c) Deducting 103.02 ODP tonnes of HCFCs from the starting point for sustained aggregate reduction in HCFC consumption;

(d) Approving the draft Agreement between the Government of Malaysia and the Executive Committee for the reduction in consumption of HCFCs, as contained in Annex I to the present document;

(e) Requesting the Fund Secretariat, once the baseline data were known, to update Appendix 2-A to the Agreement to include the figures for maximum allowable consumption, and to notify the Executive Committee of the resulting change in the levels of maximum allowable consumption; and

(f) Approving the first tranche of stage I of the HPMP for Malaysia, and the corresponding implementation plan, at the amount of US $5,000,000 plus agency support costs of US $375,000 for UNDP.

Annex I

DRAFT AGREEMENT BETWEEN THE GOVERNMENT OF MALAYSIA AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUROCARBONS

1. This Agreement represents the understanding of the Government of Malaysia (the "Country") and the Executive Committee with respect to the reduction of controlled use of the ozone-depleting substances (ODS) set out in Appendix 1-A ("The Substances") to a sustained level of 464.18 ODP tonnes by 1 January 2015 in compliance with Montreal Protocol schedules, with the understanding that this figure is to be revised one single time, once the baseline consumption for compliance has been established based on Article 7 data.

2. The Country agrees to meet the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A ("The Targets, and Funding") in this Agreement as well as in the Montreal Protocol reduction schedule for all Substances mentioned in Appendix 1-A. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in paragraph 3, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to any consumption of the Substances that exceeds the level defined in row 1.2 of Appendix 2-A as the final reduction step under this Agreement for all of the Substances specified in Appendix 1-A, and in respect to any consumption of each of the Substances that exceeds the level defined in rows 4.1.3 and 4.2.3, 4.3.3, 4.4.3, 4.5.3, 4.6.3 and 4.7.3 (remaining eligible consumption).

3. Subject to compliance by the Country with its obligations set out in this Agreement, the Executive Committee agrees, in principle, to provide the funding set out in row 3.1 of Appendix 2-A to the Country. The Executive Committee will, in principle, provide this funding at the Executive Committee meetings specified in Appendix 3-A ("Funding Approval Schedule").

4. The Country agrees to implement this Agreement in accordance with the HCFC phase-out sector plans submitted. In accordance with sub-paragraph 5(b) of this Agreement, the Country will accept independent verification of the achievement of the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A of this Agreement. The aforementioned verification will be commissioned by the relevant bilateral or implementing agency.

5. The Executive Committee will not provide the Funding in accordance with the Funding Approval Schedule unless the Country satisfies the following conditions at least eight weeks in advance of the applicable Executive Committee meeting set out in the Funding Approval Schedule:

(a) That the Country had met the Targets set out in row 1.2 of Appendix 2-A for all relevant years. Relevant years are all years since the year in which this Agreement was approved. Years for which no obligation for reporting of country programme data exists at the date of the Executive Committee meeting at which the funding request is being presented are exempted;

(b) That the meeting of these Targets has been independently verified, unless the Executive Committee decided that such verification would not be required;

(c) That the Country had submitted annual implementation reports in the form of Appendix 4-A ("Format of Implementation Reports and Plans") covering each previous calendar year; that it had achieved a significant level of implementation of activities initiated with previously approved tranches; and that the rate of disbursement of funding available from the previously approved tranche was more than 20 per cent;

(d) That the Country has submitted an annual implementation plan in the form of Appendix 4-A covering each calendar year until and including the year for which the funding schedule foresees the submission of the next tranche or, in case of the final tranche, until completion of all activities foreseen; and

(e) That, for all submissions from the 68th meeting onwards, confirmation has been received from the Government that an enforceable national system of licensing and quotas for HCFC imports and, where applicable, production and exports is in place and that the system is capable of ensuring the Country's compliance with the Montreal Protocol HCFC phase-out schedule for the duration of this Agreement.

6. The Country will ensure that it conducts accurate monitoring of its activities under this Agreement. The institutions set out in Appendix 5-A ("Monitoring Institutions and Roles") will monitor and report on implementation of the activities in the previous annual implementation plans in accordance with their roles and responsibilities set out in Appendix 5-A. This monitoring will also be subject to independent verification as described in paragraph 4 above.

7. The Executive Committee agrees that the Country may have the flexibility to reallocate the approved funds, or part of the funds, according to the evolving circumstances to achieve the smoothest reduction of consumption and phase-out of the Substances specified in Appendix 1-A:

(a) Reallocations categorized as major changes must be documented in advance either in an annual implementation plan submitted as foreseen in sub-paragraph 5(d) above, or as a revision to an existing annual implementation plan to be submitted eight weeks prior to any meeting of the Executive Committee, for its approval. Major changes would relate to:

(i) Issues potentially concerning the rules and policies of the Multilateral Fund;

(ii) Changes which would modify any clause of this Agreement;

(iii) Changes in the annual levels of funding allocated to individual bilateral or implementing agencies for the different tranches; and

(iv) Provision of funding for programmes or activities not included in the current endorsed annual implementation plan, or removal of an activity in the annual implementation plan, with a cost greater than 30 per cent of the total cost of the last approved tranche;

(b) Reallocations not categorized as major changes may be incorporated in the approved annual implementation plan, under implementation at the time, and reported to the Executive Committee in the subsequent annual implementation report;

(c) Should the Country decide during implementation of the agreement to introduce an alternative technology other than that proposed in the approved HPMP, this would require approval by the Executive Committee as part of an Annual Implementation Plan or the revision of the approved plan. Any submission of such a request for change in technology would identify the associated incremental costs, the potential impact to the climate, and any differences in ODP tonnes to be phased out if applicable. The Country agrees that potential savings in incremental costs related to the change of technology would decrease the overall funding level under this Agreement accordingly; and

(d) Any remaining funds will be returned to the Multilateral Fund upon completion of the last tranche foreseen under this Agreement.

8. Specific attention will be paid to the execution of the activities in the refrigeration servicing sub-sector, in particular:

(a) The Country would use the flexibility available under this Agreement to address specific needs that might arise during project implementation; and

(b) The Country and the bilateral and implementing agencies involved will take full account of the requirements of decisions 41/100 and 49/6 during the implementation of the plan.

9. The Country agrees to assume overall responsibility for the management and implementation of this Agreement and of all activities undertaken by it or on its behalf to fulfil the obligations under this Agreement. UNDP has agreed to be the lead implementing agency (the "Lead IA") in respect of the Country's activities under this Agreement. The Country agrees to evaluations, which might be carried out under the monitoring and evaluation work programmes of the Multilateral Fund or under the evaluation programme of any of the agencies taking part in this Agreement.

10. The Lead IA will be responsible for ensuring co-ordinated planning, implementation and reporting of all activities under this Agreement, including but not limited to independent verification as per sub-paragraph 5(b). The Executive Committee agrees, in principle, to provide the Lead IA with the fees set out in row 2.2 of Appendix 2-A.

11. Should the Country, for any reason, not meet the Targets for the elimination of the Substances set out in row 1.2 of Appendix 2-A or otherwise does not comply with this Agreement, then the Country agrees that it will not be entitled to the Funding in accordance with the Funding Approval Schedule. At the discretion of the Executive Committee, funding will be reinstated according to a revised Funding Approval Schedule determined by the Executive Committee after the Country has demonstrated that it has satisfied all of its obligations that were due to be met prior to receipt of the next tranche of funding under the Funding Approval Schedule. The Country acknowledges that the Executive Committee may reduce the amount of the Funding by the amount set out in Appendix 7-A ("Reductions in Funding for Failure to Comply") in respect of each ODP kg of reductions in consumption not achieved in any one year. The Executive Committee will discuss each specific case in which the Country did not comply with this Agreement, and take related decisions. Once these decisions are taken, this specific case will not be an impediment for future tranches as per paragraph 5 above.

12. The Funding of this Agreement will not be modified on the basis of any future Executive Committee decision that may affect the funding of any other consumption sector projects or any other related activities in the Country.

13. The Country will comply with any reasonable request of the Executive Committee and the Lead IA to facilitate implementation of this Agreement. In particular, it will provide the Lead IA with access to the information necessary to verify compliance with this Agreement.

14. The completion of stage I of the HPMP and the associated Agreement will take place at the end of the year following the last year for which a maximum allowable total consumption level has been specified in Appendix 2-A. Should there at that time still be activities that are outstanding, and which were foreseen in the Plan and its subsequent revisions as per sub-paragraph 5(d) and paragraph 7, the completion will be delayed until the end of the year following the implementation of the remaining activities. The reporting requirements as per sub-paragraphs 1(a), 1(b), 1(d), and 1(e) of Appendix 4-A will continue until the time of the completion unless otherwise specified by the Executive Committee.

15. All of the conditions set out in this Agreement are undertaken solely within the context of the Montreal Protocol and as specified in this Agreement. All terms used in this Agreement have the meaning ascribed to them in the Montreal Protocol unless otherwise defined herein.

APPENDICES

APPENDIX 1-A: THE SUBSTANCES

Substance	Annex	Group	Starting point for aggregate reductions in consumption (ODP tonnes)
HCFC-123	C	I	1.13
HCFC-141	C	I	0.94
HCFC-141b	C	I	162.54
HCFC-142b	C	I	0.79
HCFC-21	C	I	0.74
HCFC-22	C	I	349.54
HCFC-225	C	I	0.08
Total			**515.76**

APPENDIX 2-A: THE TARGETS, AND FUNDING

Row	Particulars	2011	2012	2013	2014	2015	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	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	N/A
2.1	Lead IA UNDP agreed funding (US $)	5,000,000	0	3,628,723	0	958,747	9,587,470
2.2	Support costs for Lead IA (US $)	375,000	0	272,154	0	71,906	719,060
3.1	Total agreed funding (US $)	5,000,000	0	3,628,723	0	958,747	9,587,470
3.2	Total support cost (US $)	375,000	0	272,154	0	71,906	719,060
3.3	Total agreed costs (US$)	5,375,000	0	3,900,877	0	1,030,653	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)						8.42
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)						341.12
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

APPENDIX 3-A: FUNDING APPROVAL SCHEDULE

1. Funding for the future tranches will be considered for approval at the last meeting of the year specified in Appendix 2-A.

APPENDIX 4-A: FORMAT OF IMPLEMENTATION REPORTS AND PLANS

1. The submission of the Implementation Report and Plan for each tranche request will consist of five parts:

(a) A narrative report, with data provided by calendar year, regarding the progress since the year prior to the previous report, reflecting the situation of the Country in regard to phase out of the Substances, how the different activities contribute to it, and how they relate to each other. The report should include ODS phase-out as a direct result from the implementation of activities, by substance, and the alternative technology used and the related phase-in of alternatives, to allow the Secretariat to provide to the Executive Committee information about the resulting change in climate relevant emissions. The report should further highlight successes, experiences, and challenges related to the different activities included in the Plan, reflecting any changes in the circumstances in the Country, and providing other relevant information. The report should also include information on and justification for any changes vis-à-vis the previously submitted Annual Implementation Plan(s), such as delays, uses of the flexibility for reallocation of funds during implementation of a tranche, as provided for in paragraph 7 of this Agreement, or other changes. The narrative report will cover all relevant years specified in sub-paragraph 5(a) of the Agreement and can in addition also include information on activities in the current year;

(b) A verification report of the HPMP results and the consumption of the Substances mentioned in Appendix 1-A, as per sub-paragraph 5(b) of the Agreement. If not decided otherwise by the Executive Committee, such a verification has to be provided together with each tranche request and will have to provide verification of the consumption for all relevant years as specified in sub-paragraph 5(a) of the Agreement for which a verification report has not yet been acknowledged by the Committee;

(c) A written description of the activities to be undertaken until and including the year of the planned submission of the next tranche request, highlighting the interdependence of the activities, and taking into account experiences made and progress achieved in the implementation of earlier tranches; the data in the plan will be provided by calendar year. The description should also include a reference to the overall plan and progress achieved, as well as any possible changes to the overall plan that are foreseen. The description should cover the years specified in sub-paragraph 5(d) of the Agreement. The description should also specify and explain in detail such changes to the overall plan. This description of future activities can be submitted as a part of the same document as the narrative report under sub-paragraph (b) above;

(d) A set of quantitative information for all annual implementation reports and annual implementation plans, submitted through an online database. This quantitative information, to be submitted by calendar year with each tranche request, will be amending the narratives and description for the report (see sub-paragraph 1(a) above) and the plan (see sub-paragraph 1(c) above), the annual implementation plan and any changes to the overall plan, and will cover the same time periods and activities; and

(e) An Executive Summary of about five paragraphs, summarizing the information of the above sub-paragraphs 1(a) to 1(d).

APPENDIX 5-A: MONITORING INSTITUTIONS AND ROLES

1. The monitoring process will be managed by the Department of Environment (DOE) through the Ozone Protection Section with the assistance of the Lead IA.

2. The consumption will be monitored and determined based on official import and export data for the Substances recorded by relevant government departments.

3. DOE shall compile and report the following data and information on an annual basis on or before the relevant due dates:

(a) Annual reports on consumption of the Substances to be submitted to the Ozone Secretariat; and

(b) Annual reports on progress of implementation of HPMP to be submitted to the Executive Committee of the Multilateral Fund.

4. DOE and Lead IA will engage an independent and qualified entity to carry out a qualitative and quantitative performance evaluation of the HPMP implementation.

5. The evaluating entity shall have full access to relevant technical and financial information related to implementation of the HPMP.

6. The evaluating entity shall prepare and submit to DOE and the Lead IA, a consolidated draft report at the end of each annual implementation plan, comprising of the findings of the evaluation and recommendations for improvements or adjustments, if any. The draft report shall include the status of the Country's compliance with the provisions of this Agreement.

7. Upon incorporating the comments and explanations as may be applicable, from DOE and Lead IA, the evaluating entity shall finalize the report and submit to DOE and Lead IA.

8. DOE shall endorse the final report and the Lead IA shall submit the same to the relevant meeting of the Executive Committee along with the annual implementation plan and reports.

APPENDIX 6-A: ROLE OF THE LEAD IMPLEMENTING AGENCY

1. The Lead IA will be responsible for a range of activities, including at least the following:

(a) Ensuring performance and financial verification in accordance with this Agreement and with its specific internal procedures and requirements as set out in the Country's HPMP;

(b) Assisting the Country in preparation of the Implementation Plans and subsequent reports as per Appendix 4-A;

(c) Providing independent verification to the Executive Committee that the Targets have been met and associated annual activities have been completed as indicated in the Implementation Plan consistent with Appendix 4-A;

(d) Ensuring that the experiences and progress is reflected in updates of the overall plan and in future annual implementation plans consistent with sub-paragraphs 1(c) and 1(d) of Appendix 4-A;

(e) Fulfilling the reporting requirements for the annual implementation reports, annual implementation plans and the overall plan as specified in Appendix 4-A for submission to the Executive Committee;

(f) Ensuring that appropriate independent technical experts carry out the technical reviews;

(g) Carrying out required supervision missions;

(h) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Implementation Plan and accurate data reporting;

(i) In case of reductions in funding for failure to comply in accordance with paragraph 11 of the Agreement, to determine, in consultation with the Country the allocation of the reductions to the different budget items;

(j) Ensuring that disbursements made to the Country are based on the use of the indicators; and

(k) Providing assistance with policy, management and technical support when required.

2. After consultation with the Country and taking into account any views expressed, the Lead IA will select and mandate an independent entity to carry out the verification of the HPMP results and the consumption of the Substances mentioned in Appendix 1-A, as per sub-paragraph 5(b) of the Agreement and sub-paragraph 1(b) of Appendix 4-A.

APPENDIX 7-A: REDUCTIONS IN FUNDING FOR FAILURE TO COMPLY

1. In accordance with paragraph 11 of the Agreement, the amount of funding provided may be reduced by US$ 186 per ODP kg of consumption beyond the level defined in row 1.2 of Appendix 2-A for each year in which the target specified in row 1.2 of Appendix 2-A has not been met.

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